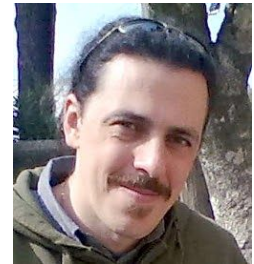


Matteo Matteucci

Curriculum Vitae et Studiorum

Name: Matteo Matteucci
Date/Place of Birth: 23/04/1974, Nuoro (Italy)
Affiliation: Politecnico di Milano
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24 / -- / 2298 ([Source: Scopus.com](#) 12/06/2020)



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Autorizzo il trattamento dei miei dati personali presenti nel cv ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 “Codice in materia di protezione dei dati personali” e del GDPR (Regolamento UE 2016/679).

Date: 20/06/2020

In compliance with the Italian legislative Decree no. 196 “Codice in materia di protezione dei dati personali” dated 30/06/2003, and the GDPR (EU 2016/679). I hereby authorize you to use and process my personal details contained in this document.”

Date: 20/06/2020

Matteo Matteucci research focuses on the use of techniques and models from Pattern Recognition, Machine Learning, Signal Processing and Artificial Intelligence to deal with uncertainty in autonomous physical and software systems perception and intelligent data analysis. Autonomous robots, unmanned vehicles, assistive technologies (where system autonomy supplies user physical or cognitive deficits) have been reference scenarios for developing models and algorithms to cope with uncertainty and incomplete knowledge.

H-Index / i10-index / Citations: 34 / 104 / 4778 ([Source: Google Scholar](#) 12/06/2020)
24 / -- / 2298 ([Source: Scopus.com](#) 12/06/2020)

Reviewed Publications: 55+ in Intl. Journals, 25+ in Intl. Books, 150+ in Intl. Conferences Proceedings.

International Activity: Visiting Scholar for 1 year at Carnegie Mellon University graduating with a Master of Science in Knowledge Discovery and Data Mining. Active since its foundation in the Euron Special Interest Group on Good Experimental Methodologies & Benchmarking (GEM SIG) for the design of suitable benchmarks and experimental methodologies for intelligent systems. Expert on Benchmarking for the RoSta and on ELS (Ethical-Legal-Societal) issues for the euRobotics FP7 projects. Active in the IEEE RAS Standard Group in the “IEEE 1873-2015 Standard for Robot Map Data Representation” and “IEEE P2751 - 3D Map Data Representation for Robotics and Automation”. Member of IFAC Technical Committee “7.5. Transportation and Vehicle Systems - Intelligent Autonomous Vehicles”. Program Committee of more than 10 International Conferences and Workshops. Reviewer for 20 International Journals (8 IEEE Transactions) and more than 20 International Conferences & Workshops.

Project Funding: Project Coordinator of FP6 European project RAWSEEDS, National Scientific Coordinator of PRIN 2009 project ROAMFREE, POLIMI Principal Investigator for FP7 project RoCKIn, POLIMI Principal Investigator for H2020 projects RoCKEU2, SciRoc, DeepField, and METRICS, POLIMI Principal Investigator & Project Technical Manager of AAL Joint Program project ALMA, Coordinator of “Brain-Computer Interfaces in Everyday Applications” Politecnico di Milano & Regione Lombardia grant.

Research achievements/products: Autonomous wheelchair to support disabled people mobility (awarded with Antonio D’Auria SIRI Prize, and Intesa Startup Initiative); benchmarking toolkit for simultaneous localization and mapping (used at international level); Brain-Computer Interface based on P300 and ErrP potentials (presented to general public and reported by national and international press); sensor fusion framework for unmanned vehicles. Co-author of “General Guidelines for Robotics Papers Involving Experiments” (Euron GEM SIG), “Suggestion for a green paper on legal issues in robotics” (euRobotics ESL SIG), “IEEE1873-2015 Standard for Robot Map Data Representation”.

Technology Transfer: 8 patents applications (3 Italian + 1 European + 3 EU extension + 1 US extension), 1 spin-off company founded with a PhD student (Nova Labs), 1 start-up company founded by PhD students (Empatica), 2 tech-transfer award (Antonio D’Auria, Intesa SanPaolo “Startup Initiative”), several industrial contracts (e.g., Aerosekur, Indesit, Gaiotto, Infosolution, Noustat, Aermatica, Aster, ENI Progetti, ABB SpA, Tracetoo).

Awards and Prizes: Rotary Ambassadorial Scholarship; Dimitris N. Chorafas Foundation Award for best PhD thesis; the autonomous wheelchair project has been awarded with “Antonio D’Auria” and the Intesa San Paolo “Startup Initiative” prizes; advisor of Luigi Malagò awarded with the Dimitris N. Chorafas Foundation Award for best PhD thesis; tutor of the “Helios” project awarded as the best project of the first 6 years of Alta Scuola Politecnica, and of the “IRoKi” project, which was another of the 6 finalists. Best papers at WACV 2016, CVPRW 2016, and CVPRW 2019.

Lecturer (Grade, Number of editions): Soft Computing (PhD, 7Ys), 3D Structure from Visual Motion (PhD, 4Ys), Deep Learning (PhD, 2Ys), Artificial Neural Networks and Deep Learning (MS, 1Y), Robotics (MS, 4Ys), Machine Learning (MS, 4Ys), Cognitive Robotics (MS, 3Ys), Pattern Analysis & Machine Intelligence (MS, 6Ys), Metodologie per Sistemi Intelligenti (MS, 2Ys), Knowledge Engineering (BS, 5Ys), Fondamenti Informatica (BS, 4Ys), Teaching Assistant: Soft Computing (MS, 16Ys), Knowledge Engineering & Expert Systems (BS, 5Ys), Fondamenti di Informatica (BS, 2Y), Information Retrieval and Data Mining (MS, 2Ys), Cognitive Robotics (MS, 1Ys).

Multidisciplinary research: I pursue multidisciplinary both in the narrow sense of “within engineering” (i.e., Pattern Recognition, Machine Learning, Signal Processing, Dynamic State Estimation, Robotics), and in the broader sense of “involving other disciplines” (e.g., Neurosciences, Geology and Environmental Science, Medicine, Transportation Science, Bioengineering, Mathematics, Social Sciences, Genomics).

Matteo Matteucci ("Laurea" 1999, MS 2002, Phd 2003) is Associate Professor at Dipartimento di Elettronica Informazione e Bioingegneria of Politecnico di Milano, Italy. In 1999 he got a Laurea degree in Computer Engineering at Politecnico di Milano, in 2002 he received a Master of Science in Knowledge Discovery and Data Mining at Carnegie Mellon University (Pittsburgh, PA), and in 2003 he got a Ph.D. in Computer Engineering and Automation at Politecnico di Milano (Milan, Italy).

His main research topics are pattern recognition, machine learning, machine perception, robotics, computer vision and signal processing. His main research interest is in developing, evaluating and applying, in a practical way, techniques for adaptation and learning to autonomous systems interacting with the physical world. He has co-authored more than 50 (peer-reviewed) papers on international journals, 25 papers in International Books, and more than 150 (peer-reviewed) contributions to international conferences and workshops. He has been principal investigator in national and international funded projects on machine learning, autonomous robots, sensor fusion and benchmarking of autonomous and intelligent systems.

His research in robotics started with the Milan Robocup Team, a RoboCup team of six soccer robots equipped with custom panoramic vision sensors, adaptive color classification algorithms, and a conceptual model to integrate robot perception with information from teammates. Then he has worked on a complete 6DoF SLAM (i.e., Simultaneous Localization and Mapping) system based on multi-camera vision and hierarchical map decomposition through conditionally independent filtering. He is now working on sensor fusion in SLAM to fuse odometric estimates coming from different sensors (e.g., inertial measurements, laser range finder, single and multiple cameras, etc.) and semantic information coming from deep neural networks into an accurate and robust perception of the robot environment.

He has been involved in the Euron Special Interest Group on Good Experimental Methodologies and Benchmarking and he is in the IEEE RAS Standard Group on "Robot 3D Map Data Representation" for Navigation. He has been the Coordinator of the European project RAWSEEDS (<http://www.rawseeds.org>) a Specific Support Action for the development of a benchmarking toolkit for multi-sensor SLAM algorithms. He has been the National Scientific Coordinator of the ROAMFREE project (<http://roamfree.dei.polimi.it>) for the development of methods for the robust estimation of robot odometry by sensor fusion funded by the Italian Ministry for the University and the Research (MIUR) under the PRIN 2009 program. He has been the Politecnico di Milano Principal Investigator in the FP7 project RoCKIn (<http://rockinrobotchallenge.eu/>) for the development of 2 robot benchmarking competitions and Project Technical Manager of the European project ALMA (<http://www.alma-aal.org>), funded under the AAL Joint Program, for the realization of an Ambient Assisted Living system to support the autonomous mobility of the elderly. He has been Principal investigator for Politecnico di Milano of the H2020 project RockEU2 and for the development of the European Robotics League (https://www.eu-robotics.net/robotics_league/), H2020 project SciRoc (<https://sciroc.eu/>) for the development of a novel Smart City and Robotics competition, H2020 project DeepField for the study of deep learning techniques in field robotics, H2020 project METRICS for the development of novel robotics benchmarks and competitions, especially in the agricultural field.

Education

- 2000 - 2003 PhD in Computer Engineering and Automation at the Department of Electronics and Information of Politecnico di Milano (17/03/2003, Milan, Italy) [PhD Thesis title: *Evolutionary Learning of Adaptive Models within a Bayesian Framework*]. Advisor: Prof. Andrea Bonarini. Awarded with the Dimitris N. Chorafas Prize for the best PhD thesis by Chorafas Foundation.
- 2001 - 2002 Master of Science in Knowledge Discovery and Data Mining at "Center for Automatic Learning & Discovery" (08/2002, Carnegie Mellon University, Pittsburgh, PA) [MS Thesis title: *ELeaRNT: Evolutionary Learning of Rich Neural Network Topologies*]. Advisor: Prof. Manuela Veloso.
- 1993 - 1999 Laurea degree in Computer Engineering at Politecnico di Milano (19/04/1999, Milan, Italy) [Thesis title: *Rappresentazione della conoscenza fuzzy e a intervalli per algoritmi di apprendimento per rinforzo applicati ad agenti situati*]. Advisor: Prof. Andrea Bonarini.

Academic Positions

- Since 2015* Associate Professor at the Department of Electronics Information and Bioengineering of Politecnico di Milano (Milan, Italy).
- 2008 - 2015* Assistant Professor (Ricercatore di ruolo confermato) at the Department of Electronics and Information of Politecnico di Milano (Milan, Italy).
- 2005 - 2008* Assistant Professor (Ricercatore di ruolo) at the Department of Electronics and Information of Politecnico di Milano (Milan, Italy).
- 2003 - 2005* Research Assistant (Assegnista di Ricerca) in the research program “Evoluzione tecnologica e nuove applicazioni delle basi di dati e dei sistemi informativi” at the Department of Electronics and Information of Politecnico di Milano (Milan, Italy).
- 2000 - 2003* PhD Student in the Computer Engineering and Automation program at the Department of Electronics and Information of Politecnico di Milano (Milan, Italy).
- 2001 - 2002* Visiting Student at the Center for Automatic Learning and Discovery at Carnegie Mellon University (Pittsburgh, PA - USA).
- 2000 - 2002* Research Assistant (Assegnista di Ricerca) in the research program “Modelli di apprendimento automatico in ambienti dinamici” at the Department of Electronics and Information of Politecnico di Milano (Milan, Italy).

Academic Roles

- Since 2020* Member of the “*Commissione Paritetica*” of the Bioinformatics for Computational Genomic joint Master program between Scuola di Ingegneria Industriale e dell’Informazione - Politecnico di Milano and Department of Biosciences Università degli Studi di Milano.
- Since 2019* Member of the Technical Board on “*Robust and Efficient mmWave Communication*” in the Joint Research Center (JRC) between Huawei - Politecnico di Milano
- Since 2018* Scientific Director of the “Master di I livello in Artificial Intelligence and Machine Learning” offered by Politecnico di Milano and CEFRIEL
- Since 2018* Member of the Faculty Board of the “*Data Analytics and Decision Sciences*” PhD Program at Politecnico di Milano
- Since 2016* Segretario Consiglio Corso di Studi in Ingegneria Informatica (secretariat of the Computer Science and Engineering program) of Politecnico di Milano
- Since 2015* Reviewer for the Italian Ministry for University and Research registered to “REPRISE: Register of Expert Peer Reviewers for Italian Scientific Evaluation”
- Since 2015* Representative (and co-founder in 2014) of the Interaction between Driver, Road Infrastructure, Vehicle, and Environment (I.DRIVE) interdepartmental laboratory of Politecnico di Milano (<http://idrive.polimi.it>).
- Since 2013* Representative (and co-founder in 2012) of the Assistive Technology Group of Politecnico di Milano - Polo Regionale di Como (<http://atg.deib.polimi.it>).
- Since 2009* Member of “Commissione Orari” for the Computer Engineering track of Politecnico di Milano - Polo Regionale di Como.
- Since 2008* “Delegato SAT” (Struttura Accademica dei Tirocini) for the Computer Engineering track at Politecnico di Milano - Campus Leonardo.
- 2010 - 2016* Member of “Commissione Didattica Laurea Specialistica” for the Computer Engineering track of Politecnico di Milano - Polo Regionale di Como.
- 2012 - 2015* Reviewer for the Italian Ministry of University and Research (Iscritto all’Albo Revisori MIUR).
- 2012 - 2013* National Action co-Leader for the “Health & Wellbeing” Action Line of the Italian Node of European Institute for Innovation and Technology (EIT).

Affiliations to Scientific Associations

- Since 2019* Member of the Istituto di Robotica e Macchine Intelligenti (I-RIM)
- Since 2018* Member of the Italian Association for Computer Vision, Pattern Recognition and Machine Learning (CVPL)
- Since 2007* Member of IEEE, the Institute of Electrical and Electronics Engineers (Computational Intelligence Society, Robotics and Automation Society).
- Since 2000* Member of the Artificial Intelligence and Robotics Lab of Politecnico di Milano.
- 2000 - 2005* Member of AI*IA, Associazione Italiana per l'Intelligenza Artificiale.

Evaluation Committees

- 13/05/2020* Member of Final Examination Commission for the PhD program in Ingegneria dell'Informazione at Dipartimento di Ingegneria dell'Informazione of Università di Pisa
- 28/02/2020* Member of Final Examination Commission for the PhD program in Ingegneria Informatica at Dipartimento di Ingegneria Informatica, Automatica e Gestionale "A. Ruberti" of Università degli studi di Roma "La Sapienza"
- 19/02/2020* Member of Final Examination Commission for the PhD program in Informatics at Institute of Computational Science (ICS) of the Università della Svizzera Italiana
- 16/01/2020* Member of Final Examination Commission for the PhD program in Mathematics and Computer Science at Università della Calabria and Biomedical Engineering at Université Claude Bernard Lyon 1 (double degree program)
- 14/01/2019* Member of the Evaluation Committee for a 09/H1 (ING-INF/05) "Professore II fascia" position at Università degli studi di Roma "La Sapienza"
- 21/09/2018* Member of Final Examination Commission for the PhD program in Computer and Control Engineering of Politecnico di Torino
- 27/08/2018* Member of "Commissione di valutazione dell'attività didattica e di ricerca" for the renewal of a Temporary Researcher contract (Ricercatore 240/2010) for Università di Parma.
- 17/05/2018* Member of Final Examination Commission for the PhD program in Computer and Control Engineering of Politecnico di Torino
- 22/02/2017* Member of Final Examination Commission for the PhD in Computer Engineering at the Department of Electronics Information and Bioengineering of Politecnico di Milano
- 07/02/2017* Member of Final Examination Commission for the PhD in Mechanical Engineering at the Department of Mechanical Engineering of Politecnico di Milano
- 11/16-01/17* Member of of the Evaluation Committee for the 09/H1 (ING-INF/05) RTDa position (Temporary Researcher) for the "Progetto H2020 INTCATCH", Dipartimento di Informatica, Università degli Studi di Verona
- 29/04/2016* Member of Final Examination Commission for the PhD in Computer Engineering at the Department of Electronics Information and Bioengineering of Politecnico di Milano
- 15/04/2014* Member of Final Examination Commission for the PhD in Meccatronica at Politecnico di Torino.

Prizes and Awards

- 17/06/2019* *Best Paper Award* for the paper "*Asynchronous Convolutional Networks for Object Detection in Neuromorphic Cameras*" at Second International Workshop on Event-based Vision and Smart Cameras in conjunction with IEEE CVPR 2019.
- In 2018* Awarded with a 20K\$ Microsoft Azure sponsorship grant as a support for the PhD Course on "Deep Learning: Theory Techniques and Applications".
- In 2017* Awarded with a 20K\$ Microsoft Azure sponsorship grant for the experimentation of "Deep Learning machine on the cloud"
- 01/07/2016* *Best Paper Award* for the paper "*ReSeg: A Recurrent Neural Network-based Model for Semantic Segmentation*" at DeepVision 2016, International Workshop on Deep Learning in

- Computer Vision in conjunction with IEEE CVPR 2016.
- 10/03/2016 *Best Paper Award (people choice)* for the paper “Automatic 3D Reconstruction of Manifold Meshes via Delaunay Triangulation and Mesh Sweeping” at 2016 IEEE Winter Conference on Applications of Computer Vision (<http://wacv16.wacv.net/index.html?p=1225.html>)
- In 2015 Awarded by NVIDIA with a Titan X GPU within the Academic Hardware Grant
- In 2014 Awarded, with Dott. Martino Migliavacca and Prof. Andrea Bonarini, of “THE BUSINESS GRANT AND THE ACCELERATION PROGRAM” with the project R2P in the Working Capital Accelerator program (WCAP 2014) by Telecom Italia.
- In 2014 Winner, with Prof. Sara Comai (referente), of the “POLISOCIAL AWARD 2014” with the project proposal “MEP: Maps for Easy Paths”.
- In 2011 Winner, with the Industrial Partner Infosolution SpA, of “Premio Antonio D’Auria 2010 per progetti e prototipi di dispositivi meccatronici innovativi di ausilio a disabili motori” from Società Italiana di Robotica e Automazione (infosolution.it, corriere.it, robosiri.it).
- In 2011 Winner, with the Industrial Partner Infosolution SpA, of the Intesa San Paolo “Startup Initiative” and the Italian round of the “Global Social Venture Competition” with the RobyWheelChair project (infosolution.it, lobbyinnovazione.it).
- In 2003 Winner of the Dimitris N. Chorafas Foundation Award for the best PhD thesis.
- 2001 - 2002 Winner of the Rotary Foundation Ambassadorial Scholarship.

Other

- Since 2017 National Scientific Qualification (“Abilitazione Nazionale” art.16 of the law 30 Dec. 2010, n.240) “Professore I fascia” for sector 09/H1.
- Since 2013 National Scientific Qualification (“Abilitazione Nazionale” art.16 of the law 30 Dec. 2010, n.240) “Professore II fascia” for sector 09/H1.
- Since 2013 National Scientific Qualification (“Abilitazione Nazionale” art.16 of the law 30 Dec. 2010, n.240) “Professore II fascia” for sector 01/B1.
- In 2014 Review and *rappporteur* for the SIR 2014 (Scientific Independence of young Researchers) funding program by the Italian Ministry of University and Research (MIUR)
- In 2011 Reviewer for the PRIN 2010-2011 (Programmi di Ricerca Scientifica di Rilevante Interesse Nazionale) funding program by the Italian Ministry of University and Research (MIUR)

Teaching activity

Lecturer and Teaching Assistant (PhD, MS, BS)

- Since 2020 **Lecturer and coordinator** for the course “*Machine Learning*” of the Bioinformatics for Computational Genomics joint program, Scuola di Ingegneria Industriale e dell’Informazione - Politecnico di Milano and Department of Biosciences Università degli Studi di Milano.
- Since 2019 **Lecturer and coordinator** for the course “*Artificial Neural Networks and Deep Learning*” of the Computer Engineering degree, Scuola di Ingegneria Industriale e dell’Informazione, Politecnico di Milano.
- Since 2016 **Lecturer and coordinator** for the course “*Robotics*” of the Computer Engineering degree, Scuola di Ingegneria Industriale e dell’Informazione, Politecnico di Milano.
- Since 2004 **Teaching assistant** for the course “*Soft Computing*” in the Computer Engineering degree, Scuola di Ingegneria Industriale e dell’Informazione (formerly Facolta’ di Ingegneria Informatica), Politecnico di Milano - Campus Leonardo,
- 2020 **Co-coordinator** for the PhD course “*Machine Learning for Non-Matrix Data*” in the PhD program in Information Technology at Dipartimento di Elettronica Informazione e Bioingegneria of Politecnico di Milano (together with Giacomo Boracchi, Cesare Alippi, Mark Carman)

- 2019 **Lecturer and coordinator** for the PhD course “*Advances in Deep Learning with Applications in Text and Image Processing*” in the PhD program in Information Engineering at Dipartimento di Elettronica Informazione e Bioingegneria, Politecnico di Milano
- 2018 **Lecturer and coordinator** for the PhD course “*Deep Learning: Theory, Techniques and Applications*” in the PhD program in Information Engineering at Dipartimento di Elettronica Informazione e Bioingegneria del Politecnico di Milano
- 2017-2015-2012-2010-2007-2005-2003: **Lecturer** for the PhD course “Soft Computing: Theory, Techniques and Applications” in the PhD Program in Information Engineering at Dipartimento di Elettronica Informazione e Bioingegneria of Politecnico di Milano.
- 2017 - 2019 **Lecturer and coordinator** for the course “Cognitive Robotics” of the Computer Engineering degree, Scuola di Ingegneria Industriale e dell’Informazione, Politecnico di Milano - Polo Regionale di Como.
- 2016 - 2019 **Lecturer and coordinator** for the course “Machine Learning” of the Computer Engineering degree, Scuola di Ingegneria Industriale e dell’Informazione, Politecnico di Milano - Polo Regionale di Como.
- 2011 - 2016 **Lecturer and coordinator** of the Laurea Specialistica course “Pattern Analysis and Machine Intelligence” for the Computer Engineering degree, Scuola di Ingegneria Industriale e dell’Informazione (formerly Scuola di Ingegneria dell’Informazione), Politecnico di Milano - Polo Regionale di Como
- 2014 - 2015 **Teaching assistant** for the course “Cognitive Robotics” of the Computer Engineering degree, Scuola di Ingegneria Industriale e dell’Informazione, Politecnico di Milano.
- 2015 **Lecturer** on Data Mining for the course “Information Retrieval and Data Mining” of the Computer Engineering degree, Scuola di Ingegneria Industriale e dell’Informazione, Politecnico di Milano - Polo Regionale di Como.
- 2014-2012-2010-2009: **Lecturer and coordinator** for the PhD course “3D Structure from Visual Motion: Novel Techniques in Computer Vision and Autonomous Vehicles” in the PhD Program in Information Engineering at Dipartimento di Elettronica Informazione e Bioingegneria of Politecnico di Milano.
- 2013-2014 **Teaching assistant** on Data Mining for the course “Information Retrieval and Data Mining” of the Computer Engineering degree, Scuola di Ingegneria Industriale e dell’Informazione, Politecnico di Milano - Polo Regionale di Como.
- 2009 - 2013 **Lecturer and coordinator** of the Laurea course “Knowledge Engineering” for the Computer Engineering degree, Facoltà di Ingegneria dell’Informazione, Politecnico di Milano - Polo Regionale di Como.
- 2006 - 2007 **Lecturer and coordinator** of the Laurea Specialistica course “Methods for Intelligent Systems” for the Computer Engineering degree, Facoltà di Ingegneria dell’Informazione, Politecnico di Milano - Polo Regionale di Como.
- 2003 - 2007 **Lecturer and coordinator** of the Laurea course “Fondamenti di Informatica” for the Electronics Engineering degree, Facoltà di Ingegneria dell’Informazione, Politecnico di Milano - Campus Leonardo.
- 2003 - 2007 **Teaching assistant** on Natural Computation for the Laurea course “Knowledge Engineering and Expert Systems” for the Computer Engineering degree, Facoltà di Ingegneria Informatica, Politecnico di Milano - Polo Regionale di Como.
- 1999 - 2001 **Teaching assistant** on C Language for the Laurea course “Fondamenti di Informatica (B)” for the Environmental Engineering degree, Facoltà di Ingegneria Civile, Ambientale e Territoriale, Politecnico di Milano - Campus Leonardo.

Other Teaching Activities

Since 2003 I have been **advisor / co-advisor** for more than 100 Laurea thesis (Master Level) at Politecnico di Milano

2020 - 2021 **Tutor** for the Alta Scuola Politecnica (<http://www.asp-poli.it>) project “RA - SEI”.

2019 - 2020 **Tutor** for the Alta Scuola Politecnica (<http://www.asp-poli.it>) project “Sprain’ with Brain”.

05/06/2020 **Lecturer** on “*Deep learning for text analysis and documents classifications*” (1.5h) in the “Corso di Formazione su AI”, Deloitte - Politecnico di Milano

01/07/2020, 15/07/2020, 29/07/2020 **Lecturer and coordinator** for the course “*Machine Learning*” (6h) in the “[Nokia] Percorso formazione AI e ML Avanzato” program organized by CEFRIEL

16/06/2020, 30/06/2020, 21/07/2020 **Lecturer and coordinator** for the course “*Machine Learning*” (8h) in the “[Nokia] Percorso formazione AI & ML ed. 2020” program organized by CEFRIEL

05/05/2020, 12/05/2020, 26/05/2020 **Lecturer** on “*Machine learning for Big Data*” (12h) in the “[NOKIA] SW Development for Big Data Platform” program organized by CEFRIEL

2019 **Lecturer and coordinator** for the “*Artificial Intelligence & Machine Learning*” course (36h) in the “[Nokia] Percorso Artificial Intelligence e Machine Learning” organized by CEFRIEL

29/11/2019 **Lecturer** on “*Machine Learning*” (8h) in the COFIDIS - Strategic Data Management course organized by MIP, Politecnico di Milano Graduate School of Business.

16/07/2019 **Lecturer** on “*Techniques and architectures for autonomous robot: autonomous driving and drones*” (4h) in the “Master di I Livello in Strategic and Innovative O&M Management” for ENEL

04/11/2018 **Webinar** on “*Data Analytics, Machine Learning & Artificial Intelligence*” (1h) in the ABB “Digital Culture Webinars” series organized by CEFRIEL

24/10/2019, 16/10/2018, 12/01/2018 **Lecturer** on “*Learning & Vision for Autonomous Machines*” (2h) in the Advanced Master in Innovation and Entrepreneurship at MIP, Politecnico di Milano Graduate School of Business

27/03/2019 **Lecturer** on “*Deep Learning for Image Understanding*” (1h) in the AI@Deloitte day, Deloitte

2019 (April-May) **Lecturer and coordinator** of the course “*Deep learning per l’analisi di immagini*” (24h out of 80h) for AGS S.P.A under a Teaching Contract with the Department of Information Electronics and Bioengineering of Politecnico di Milano (resp. Prof. Matteo Matteucci and Giacomo Boracchi)

30/01/2019 **Lecturer** on “*Machine Learning*” (8h) for eGeos company as part of a Teaching Contract with the Department of Information Electronics and Bioengineering of Politecnico di Milano (resp. Prof. Chiara Francalanci)

10/12/2018 **Webinar** on “*Machine Learning and Artificial Intelligence*” (1h) in the ABB “Digital Culture Webinars” series organized by CEFRIEL

13/12/2018, 11/12/2018, 04/12/2018 **Lecturer** on “*Artificial Intelligence*” (3x8h) in the “[Edison] Formazione ICT” course at CEFRIEL.

29/03/2018, 05/04/2018, 12/04/2018, 18/04/2018 **Lecturer** on “*Advanced Machine Learning*” in the [Regione Lombardia] III Ed. Master Universitario in Alto Apprendistato e Ricerca on Analytics & Business Intelligence at CEFRIEL.

27/02/2018, 28/02/2018 **Lecturer** on “*Modulo Big Data*” in the [Regione Lombardia] Master Universitario in Alto Apprendistato e Ricerca on Industry 4.0 - BOSCH at CEFRIEL.

23/05/2016 **Invited lecturer** on “*Hidden Markov Models*” in the Laurea Specialistica course “*Machine Learning*” by Prof. Marcello Restelli in the Computer Science and Engineering Program of Politecnico di Milano

07/04/2016, 11/04/2016 **Invited lecturer** on “*Deep Learning and Neural Networks*” in the Laurea Specialistica course “*Machine Learning*” by Prof. Marcello Restelli in the Computer Science and Engineering Program of Politecnico di Milano

04/04/2017, 17/04/2015, 08/05/2014, 09/04/2013, 04/05/2012, 29/04/2011 **Invited lecturer** on “*Brain-Computer Interfaces @AIRLab*” in the Laurea Specialistica course “*Accessibility*” by Prof. Licia Sbattella in Computer Engineering degree of Politecnico di Milano - Polo Regionale di Como

15/04/2015 **Invited lecturer** on “*An Introduction to Computer Vision*” in the ISEP - 8th International Week - “*Inspiring Engineering*” at the Instituto Superior de Engenharia do Porto, Porto (Portugal).

2014 - 2015 **Lecturers** on “*Robotica*” in the IFTS 56628286 “*Tecnico superiore per l’innovazione di prodotto e del processo in ambito manifatturiero e delle energie rinnovabili*”

2010 - 2012 **Tutor** for the Alta Scuola Politecnica (<http://www.asp-poli.it>) project “*TSC4MiTo: The Social Computing for Milano and Torino*”.

- 25/05/2012 **Invited lecturer** on “Robotics benchmarking from the inside: The RAWSEEDS Experience” for the PhD course on “Computing and Science” by Prof. Viola Schiaffonati and Prof. Francesco Amigoni from the Dipartimento di Elettronica e Informazione del Politecnico di Milano
- 2009 - 2011 **Tutor** for the Alta Scuola Politecnica project “WillChair: reinventing the wheels ... into wills!” from which the project “Clever” has won the “[Lifeability Award](#)” in the Bioengineering category
- 2006 - 2008 **Tutor** for the Alta Scuola Politecnica project “SenSoBot: Sensors and control for Societal Robots”
- 2005 - 2007 **Tutor** for the Alta Scuola Politecnica project “WoMan: Windows On Man”, from which the project “Helios” has been awarded as the best multidisciplinary project for the first 6 years of Alta Scuola Politecnica during the event “[Riconoscere e premiare l'eccellenza e l'innovazione - una sfida per l'Italia che crede nel futuro](#)” (ASP + Confindustria)
- 17/11/2006 **Lecturer** on Neural Networks for the course “Cybernetics” in the “Sapere a tutto campo” program at Università Bocconi
- 2005 - 2006 **Tutor** for the Alta Scuola Politecnica project “IRoPa: Intelligent Robotic Partners”
- 2005 - 2006 **Tutor** for the Alta Scuola Politecnica project “AMoRoSA: Autonomous Mobile Robots for Service Applications”. The team “IeRoKi” (<http://www.ieroki.it/>) has been selected in 2012 among the 6 best ASP project in the 2006-2012 years (award won by the “Helios” project, 2005-2007 period)
- 06/09/2006 **Lecturer** on “Soft Computing: Neural Networks Theory and Applications” Continuous Education course for an Italian Company (company name undisclosed for NDA clause)
- 26/05/2005 **Lecturer** on “Dal filtraggio alla Kalman ai filtri a particelle” for the Laurea course “Robotica complementi” for the Computer Science degree, Facolta' di Scienze Fisiche e Naturali, Università degli Studi di Milano-Bicocca.
- 20/05/2005 **Lecturer** on “Tecniche di filtraggio Bayesiano” for the Laurea course “Robotica complementi” for the Computer Science degree, Facolta' di Scienze Fisiche e Naturali, Università Degli Studi Milano-Bicocca..
- 26/04/2004 **Invited lecturer** on “Perchè oggi non servono (ancora) le tre leggi della robotica?” for the thematic session “Dall'Intelligenza Artificiale ai robot” for the Master Program in Scientific Communication at SISSA, Trieste.
- 04/2000 - 06/2000 **Tutoring activity** for the Laurea courses of “Fondamenti di Informatica” for the Engineering degrees of Politecnico di Milano, Campus Bovisa.
- 1997 - 1999 **Tutoring activity** (Computer Science, Calculus and Geometry) for the freshmen at Politecnico di Milano, a.a. 97/98 e a.a 98/99.

Supervision and Revision of PhD Theses

Advised PhD Students

- Since 2020* Filippo Mela (E&Y PhD Executive Student): Knowledge Representation, Deep Social Analytics
- Since 2020* Leonardo Di Perna (E&Y PhD Executive Student): Bio-Data Analysis, Deep Social Analytics
- Since 2019* Riccardo Bertoglio (PhD Student): Agricultural Robotics
- Since 2019* Matteo Frosi (PhD Student): 3D SLAM with Priors
- Since 2018* Marco Cannici (PhD Student): Deep Learning and Differentiable Programming
- Since 2018* Enrico Piazza (PhD Student, joint program with IST Lisbon): Robot Benchmarking
- Since 2018* Francesco Lattari (PhD Student): Machine Learning and Data Mining for Satellite RADAR Images (in cooperation with TRE-Altamira)
- Since 2017* Alessandro Brusaferrì (CNR PhD Executive Student): Machine learning for optimization of energy intensive industrial processes
- Since 2017* Simone Mentasti (PhD Student): Multi sensor fusion in autonomous connected cars (inter-department scholarship with the Mechanical department of Politecnico di Milano)
- Since 2016* Alessandro Gabrielli (PhD Student): Interaction between Driver and Autonomous Vehicles.
- Since 2016* Marco Ciccone (PhD Student): Deep Learning for Robotic Vision.

- 2015 - 2020 Gianluca Bardaro, "Models, Code Generation and Abstractions - A Triple Approach to Enhance Robot Software Development". Post-doc at Open University, UK.
- 2012 - 2017 Andrea Romanoni, "Incremental Large-Scale Visual 3D Mesh Reconstruction". Applied scientist at Amazon.
- 2012 - 2017 Francesco Visin, "Deep recurrent neural networks for visual scene understanding". Research scientist at Google DeepMind (<https://www.linkedin.com/in/francescovisin/>)
- 2011 - 2014 Davide Cucci, "A General Sensor-fusion and Parameters Self-calibration Framework with Applications in Mobile Robotics". Post-doc at EPFL (<http://personnes.epfl.ch/211269>) consultant at Mind Earth (<https://www.mindearth.org/>)
- 2010 - 2013 Simone Ceriani, "Conditionally independent visual slam with integrated bundle adjustment". Scientific Project Officer at the European Commission Joint Research Centre ([linkedin](https://www.linkedin.com/in/simoneceriani/)).
- 2008 - 2011 Luigi Malagò, "On the geometry of optimization based on the exponential family relaxation". (**Thesis award:** Dimitris N. Chorafas Foundation). Principal Investigator and Group Leader of the Machine Learning and Optimization Group, Romanian Institute of Science and Technology - RIST ([linkedin](https://www.linkedin.com/in/luigimalago/)).
- 2006 - 2009 Davide Antonio Migliore, "Monocular Simultaneous Localization and Mapping with Bearing-Only Tracking". Project Manager on Embedded Computer Vision Solutions at Prophesee ([linkedin](https://www.linkedin.com/in/davideantonio/)).
- 2005 - 2009 Bernardo Dal Seno, "Toward an Integrated P300-And ErrP-Based Brain-Computer Interface". Site Reliability Engineer at Google ([linkedin](https://www.linkedin.com/in/bernardodal-seno/)).

Co-Advised PhD Students

- Since 2018 Linda Greta Dui (advised by Prof. Simona Ferrante at Politecnico di Milano), working on Quantitative Evaluation of Writing Difficulties
- Since 2017 Ava Vali (advised by Prof. Sara Comai at Politecnico di Milano), working on HyperSpectral Images Analysis
- 2014 - 2017 Ludovico Russo (advised by Prof. Basilio Bona at Politecnico di Torino): working on Robot Visual Navigation and Cloud Robotics (Telecom Italia grant).
- 2013 - 2016 Vahid Jalili (advised by Marco Masseroli at Politecnico di Milano): working on data analysis of Next Generation Sequencing (NGS) data for the Genomic Computing project.
- 2010 - 2014 Martino Migliavacca (advised by prof. Andrea Bonarini at Politecnico di Milano), "The R2P framework for robot prototyping: methodological approach, hardware modules, and software components". Post-doc at the AIRLab, Politecnico di Milano ([linkedin](https://www.linkedin.com/in/martino-migliavacca/)).
- 2008 - 2011 Maurizio Garbarino (advised by Prof. Andrea Bonarini at Politecnico di Milano), "Modeling emotional interaction in affective computing experiments: a study on affect recognition in videogames". Chief Science Officer at Empatica S.r.l ([linkedin](https://www.linkedin.com/in/maurizio-garbarino/)).
- 2007 - 2010 Simone Tognetti (advised by Prof. Andrea Bonarini at Politecnico di Milano), "A methodological framework for physiology based affective computing: definition and evaluation". CTO & co-founder of Empatica S.r.l ([linkedin](https://www.linkedin.com/in/simone-tognetti/)).
- 2006 - 2009 Daniele Marzorati (advised by Prof. Domenico G. Sorrenti at Università degli Studi di Milano-Bicocca) "Uncertainty Modeling in 3D Vision-based SLAM". AI Application Engineer at Infosolution SpA ([linkedin](https://www.linkedin.com/in/daniele-marzorati/)).
- 2003 - 2006 Melchiorre Caterina (advised by Prof. Angelo Cavallin at Università degli Studi di Milano-Bicocca) "Progettazione ed applicazione di modelli quantitativi basati su reti neurali artificiali per la cartografia della suscettibilità connessa a movimenti di versante". Researcher at Uppsala University ([linkedin](https://www.linkedin.com/in/melchiorre-caterina/)).

PhD Thesis Reviewer

- Dec 2019 Reviewer for the thesis titled "A hierarchy of graph-based methods to study the behavior of immune cells in vivo" by Diego Ulisse Pizzagalli, PhD program in Informatics, Università della

Svizzera Italiana

- May 2018 Reviewer for the thesis titled “*Physical Interaction of Autonomous Robots in Complex Environments*” by Giorgio Toscana, PhD program in Computer and Control Engineering of Politecnico di Torino.
- Jan. 2017 Reviewer for the thesis titled “*Robust Feature-based LIDAR Localization and Mapping in Unstructured Environments*” by Fabjan Kallasi, PhD program in Tecnologie dell’Informazione from Università degli Studi di Parma.
- May 2017 Review for the thesis titled “A General Approach to Map Merging on Pose Graphs” by Tiago Maria Buonanni, PhD program in Engineering in Computer Science, Sapienza Università di Roma
- Dec. 2016 Reviewer for the thesis titled “*Metrological Analysis of Time-Of-Flight Cameras Performance for Multipurpose 3D Reconstruction*” by Silvio Giancola, PhD program in Measurement and Experimental Techniques, from Politecnico di Milano.
- May 2014 Reviewer for the thesis titled “Instrumenting and Mining Smart Spaces” by Francesco Leotta, PhD program in Engineering in Computer Science, Sapienza Università di Roma

International Editorial Activities

International Committees

- IEEE RAS Standards Development Working Group “3D-MDR - Robot 3D Map Data Representation”
- IEEE Standardization Committee for the “P1873/D1 Standard for Robot Map Data Representation for Navigation”
- IFAC Technical Committee “7.5. Transportation and Vehicle Systems - Intelligent Autonomous Vehicles”

International Journal and Conference Editorial Role

- Associate Editor for the Special Session on “Research Reproducibility and Benchmarking of Intelligent Robots” of 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2018).
- Associate Editor of 2017 IEEE International Conference on Robotics and Automation (ICRA 2017)

International Conferences and Workshops Program Committees

- ECAI 2020: Senior Program Committee member of the European Conference on Artificial Intelligence
- ECMR 2019: Technical Program Committee of the European Conference on Mobile Robots
- EBHAIS 2019: Program Committee of Workshop on Evaluation and Benchmarking of Human-Centered AI Systems
- EUSIPCO 2018: Technical Program Committee of the 26th European Signal Processing Conference, Area Chair for the “Signal Processing for Robotics” track
- CPSBench 2018: Program Committee of the 1st Workshop on Benchmarking Cyber-Physical Networks and Systems (CPSBench)
- ICARSC 2017: Program Committee of the 17th International Conference on Autonomous Robot Systems and Competitions)
- MOD 2017: Program Committee of 3rd Int.l Workshop on Machine learning, Optimization and big Data
- IKT2015: 7th International Conference on Information and Knowledge Technology
- MVS 2014: Program Committee of the 3rd IFAC Workshop on Multivehicle Systems
- IAS 2014: Program Committee of the 13th International Conference on Intelligent Autonomous Systems.
- IFAC 2014: Program Committee for International Federation of Automatic Control World Conference.
- IAV 2013 - IAV 2010: Program Committee of IFAC Symposium on Intelligent Autonomous Vehicles.

- CETC 2013: Program Committee of Conference on Electronics, Telecommunication and Computers.
- PPSN 2012: Program Committee of International Conference on Parallel Problem Solving from Nature.
- VS-Games 2011: Program Committee of International Conference in Games and Virtual Worlds for Serious Applications.
- ACII 2011: Program Committee of International Conference on Affective Computing and Intelligent Interaction.
- ISNN 2011: Program Committee of International Symposium on Neural Networks.
- ICANN 2010: Program Committee of International Conference on Artificial Neural Networks.
- ICDS 2009: Program Committee of ACM/IEEE International Conference on Distributed Smart Cameras.
- RoboPer 2008: Program Committee of International Workshop on Robotic Perception.
- RoboVis 2007: Program Committee of International Workshop on Robot Vision.

Reviewer for International Journals and Magazines

- AICom (Artificial Intelligence Communication)
- Automatica
- Computers and Electronics in Agriculture
- Computer Methods and Programs in Biomedicine
- Data and Knowledge Engineering Journal
- Evolutionary Computation
- IEEE Transactions on System Man and Cybernetics - Part C
- IEEE Transactions on Automation Science and Engineering
- IEEE Transactions on Evolutionary Computation
- IEEE Transactions on Emerging Topics in Computational Intelligence
- IEEE Transactions on Instrumentation and Measurement
- IEEE Transactions on Neural Networks
- IEEE Transactions on Fuzzy Systems
- IEEE Transactions on Robotics (IEEE TRO)
- IEEE Robotics and Automation Magazine (IEEE RAM)
- IEEE Robotics and Automation Letters (IEEE RA-L)
- IEEE Systems Journal
- International Journal of Advanced Robotic Systems
- Computers in Biology and Medicine
- Sensors
- Robotica

Reviewer for International Conferences and Workshops

- RSS 2020: Reviewer for the Robotics: Science and Systems conference
- BMVC 2020: Reviewer for the British Machine Vision Conference
- IROS 2020, 2017, 2015, 2014, 2013, 2012, 2010: Reviewer for the IEEE/RSJ International Conference on Intelligent Robots and Systems
- ITSC 2020, 2019: Reviewer for the IEEE Intelligent Transportation Systems Conference
- ICUAS 2020: Reviewer for the International Conference on Unmanned Aircraft Systems
- ECMR 2019: Reviewer for the European Conference on Mobile Robots
- AUTOMOTIVE 2019, 2018: Reviewer for the International Conference of Electrical and Electronic Technologies for Automotive
- ICRA 2019, 2018, 2016, 2015, 2014, 2011, 2010, 2008: Reviewer for the IEEE International Conference on Robotics and Automation
- MOD 2017: Reviewer for the 3rd Int. Workshop on Machine learning, Optimization and big Data
- RSS 2016: Reviewer for the Robotics: Science and System Conference

- IECON 2016: Reviewer for the 42nd Annual Conference of the IEEE Industrial Electronics Society
- AIRO 2016: Reviewer for the 3rd Italian Workshop on Artificial Intelligence and Robotics
- IJCAI 2015: Reviewer for the International Joint Conference on Artificial Intelligence
- IAS 2014, 2008, 2004, Reviewer for the International Conference on Intelligent Autonomous Systems.
- IFAC WC 2014, 2011, 2008, Reviewers for the International Federation of Automatic Control World Conference.
- CETC 2013, Reviewer for the Conference on Electronics, Telecommunication and Computers.
- ISIEA 2012, Reviewer for the IEEE Symposium on Industrial Electronics and Applications.
- PPSN 2012, Reviewer for the 12th International Conference on Parallel Problem Solving From Nature.
- IJCNN 2012, 2011, 2010, 2009, 2007, Reviewer for the International Joint Conference on Neural Networks.
- MED 2012, Reviewer for the 20th Mediterranean Conference on Control and Automation.
- TAROS 2011: Reviewer for the 12th Conference Towards Autonomous Robotic Systems.
- ISNN 2011, Reviewer for the International Symposium on Neural Networks.
- ACII 2011, Reviewer for the 4th biannual International Conference on Affective Computing and Intelligent Interaction.
- RoboCup 2011, 2010, 2009, 2008, 2007, 2006, 2005 Reviewer for the RoboCup International Symposium.
- ICANN 2010, 2009 Reviewer for the International Conference on Artificial Neural Networks.
- IAV 2010, Reviewer for the 7th Symposium on Intelligent Autonomous Vehicles.
- IEEE CIG 2010, Reviewer for the IEEE Conference on Computational Intelligence and Games.
- CITSA 2009 Reviewer for the 6th International Conference on Cybernetics & Information Technologies, Systems & Applications.
- IEEE WCCI 2008, Reviewers for the IEEE World Congress on Computational Intelligence.
- CIMSA 2008, Reviewer for Computational Intelligence for Measurement Systems and Applications conference.
- WILF 2007, Reviewer for the International Workshop on Fuzzy Logic and Applications.

Session Chair and Co-Chair

- IROS 2018, IEEE/RSJ International Conference on Intelligent Robots and Systems, Special Session: "Research Reproducibility and Benchmarking of Intelligent Robots"
- IAS-15 2018, 15th International Conference on Intelligent Autonomous Systems. Session: "3D Sensing"
- IAV 2016, IFAC Intelligent Autonomous Vehicles Symposium 2016. Session "Localization and Mapping"
- IAV 2016, IFAC Intelligent Autonomous Vehicles Symposium 2016. Session "Applications"
- IAS-13 2014, 13th International Conference on Intelligent Autonomous Systems. Session: "Robot Development I"
- IROS 2012 Workshop on Progress, Challenges and Future Perspectives in Navigation and Manipulation Assistance for Robotic Wheelchairs. Session: "Autonomous wheelchair navigation and environment modelling".
- IFAC 2011, World Congress of the International Federation of Automatic Control. Session: "Mechatronics, robotics and components".
- IFAC 2011, World Congress of the International Federation of Automatic Control. Session: "Mission planning and decision making".
- ICRA 2007, IEEE International Conference on Robotics and Automation. Session: "Monocular SLAM".
- IAV 2004, 5th IFAC Symposium on Intelligent Autonomous Vehicles. Session: "Architectures".

Conference and Workshop Organization

- Local Chair for the 25th International Conference on Pattern Recognition (ICPR 2020), Milan, Italy, September 2020

- ERF 2018 Workshop on “*Research Reproducibility in Robotics*” (part of the Competitions and Benchmarking) co-organized with Fabio Bonsignorio, Tampere, Finland, 12th March 2018
- ERF 2017 Workshop on “*Robotics Competitions and Challenges*” co-organized with Agostino De Santis, Edinburgh, Scotland, 24th March 2017
- IROS 2012 Workshop on “Progress, Challenges and Future Perspectives in Navigation and Manipulation Assistance for Robotic Wheelchairs”, Vilamoura, Algarve, Portugal, October 7th to 12th, 2012.
- ICAR 2009 International Workshop on “Benchmarking in Mobile Robotics – State of the Art, Open Challenges, and Research Roadmap –” at the 14th International Conference on Advanced Robotics, Munich, Germany June 22nd to 26th, 2009.

Projects & Fundings

Research Projects

- 2020 - 2022 **Principal Investigator** for Politecnico di Milano (Partner) in the H2020 European project “METRICS: Metrological evaluation and testing of robots in international competitions”. In particular POLIMI is in charge of the design and implementation of the Agri-food Competition for Robot Evaluation (ACRE).
- 2020 **Principal Investigator** for Politecnico di Milano (Partner) for the EIT Manufacturing Activity A2001 in the EIT-20119 project “*LoViCoSpec*” for the development of a industrial inspections systems based on hyperspectral cameras. In particular we are in charge of using machine/deep learning techniques for image analysis.
- 2019 - 2022 **Principal Investigator** for Politecnico di Milano (Partner) in the H2020 European project “*DEEPFIELD: Deep Learning in Field Robotics - from conceptualization towards implementation*”. In particular POLIMI is in charge of the application scenario related to Deep Learning in the precision agriculture and agricultural robotics fields.
- 2019 - 2020 **Principal Investigator** for Politecnico di Milano (Partner) for the “*BEAST: Benchmark-Enabling Active Shopping Trolley*” Financial Support for Third Parties (FSTP) action within the H2020 project EUROBENCH. The goal of the FSTP action is the design of a benchmark for autonomous robots based on a sensorized and actuated trolley to be pushed by humanoid robots and to be deployed at the EUROBENCH benchmarking facility.
- 2019 - 2020 **Principal Investigator** for Politecnico di Milano (Partner) for the “*MADROB: Modular Active Door for RObot Benchmarking*” Financial Support for Third Parties (FSTP) action within the H2020 project EUROBENCH. The goal of the FSTP action is the design of a benchmark for autonomous robots based on a sensorized and actuated door to be operated by humanoid robots and to be deployed at the EUROBENCH benchmarking facility.
- 2019 - 2020 **Principal Investigator** for Politecnico di Milano (Partner) for the “*MATTCH: Machine Learning Methods for SAR-derived Time Series Trend Change Detection*” funded by the European Space Agency (ESA) with the aim of using Deep Learning techniques in detecting changes in ground displacement time series measured via SAR interferometry.
- 2018 - 2021 **Principal Investigator** for Politecnico di Milano (Partner) in the H2020-ICT-780086 European project “*SciRoc: European Robotics League plus Smart Cities Robot Competitions*”. In particular POLIMI is in charge of the benchmarking activities of the European Robotics League continuation and for the Smart City Competitions.
- 2017 - 2021 **Investigator** for Politecnico di Milano (Partner) for the H2020 project “*L4MS: Logistics for Manufacturing SMEs*” for the development of an integration platform to speed up the deployment of robotics logistics in manufacturing SMEs. (Principal Investigator for Politecnico di Milano prof. Luca Fumagalli DIG)
- 2018 - 2019 **Principal Investigator** for Politecnico di Milano (Partner) for the “*Plug&Bench*” Integrated Targeted Project (cascade funding schema) within the H2020 project RobMoSys. The goal of

the ITP is to design a meta-model for a robot benchmarking component within the RobMoSys Meta-Models Ecosystem.

- 2017 - 2020 **Investigator** for Politecnico di Milano (Partner) of the project “*TEINVEIN: Tecnologie per veicoli intelligenti*” funded by Regione Lombardia for the development of technologies for autonomous driving. In particular I am involved in the development of sensor fusion technologies. (Principal Investigator for Politecnico di Milano, prof. Franco Zappa)
- 2018 **Principal Investigator** for Politecnico di Milano (Partner) for the EIT Activity A1803 in the EIT-18065 project “*Drone112*” for the development of a cloud service for the deployment of drones in search and rescue scenarios. In particular I have been involved in the development of machine learning algorithms for the video analytics.
- 2016 - 2018 **Principal Investigator** for Politecnico di Milano (Partner) in the H2020-ICT-688441 European project “*RockEU2: Robotics Coordination Action for Europe Two*”. In particular POLIMI is in charge of the benchmarking activities of the European Robotics League (https://www.eu-robotics.net/robotics_league/).
- 2016 - 2018 **Investigator** for Politecnico di Milano (Partner) in the “*GRAPE: Ground Robot for vineyard monitoring and Protection*” Experiment in agricultural robotics of the FP7-ICT601116 European project *ECHORD++* (<http://www.grape-project.eu/>). (Principal Investigator for Politecnico di Milano, Prof. Luca Bascetta).
- 2017 **Principal Investigator** for Politecnico di Milano (Partner) for the EIT Activity A1703 in the EIT-17118 project “*Cloud4Drones*” for the development of a cloud service for drones. In particular I have been involved in the development of cloud service for 3D reconstruction.
- 2013 - 2015 **Principal Investigator** for Politecnico di Milano (Partner) in the FP7-ICT-601012 European project “*RoCKIn: Robot Competitions Kick Innovation in Cognitive Systems and Robotics*”. (<http://www.rockinrobotchallenge.eu/>).
- 2013 - 2015 **Project Technical Manager** and **Principal Investigator** for Politecnico di Milano (Partner) in the AAL Joint Program European project “*ALMA: Aging without Losing Mobility and Autonomy*”. (<http://www.alma-aal.org>).
- 2014 - 2015 **Investigator** and member for Politecnico di Milano (Partner) of the **Technical Board** of OR3 activities (Comfort Manager) of project SHELL (Ecosistemi domestici condivisi ed interoperabili per ambienti di vita sostenibili, confortevoli e sicuri) funded by MIUR as part of the research program “*Tecnologie per gli ambienti di vita*”. (Scientific director for Politecnico di Milano, Prof. Letizia Tanca).
- 2012 - 2014 **Principal Investigator** (together with Prof. Marco Lovera) for the Department of Electronics and Information in the project SINOPIAE “*Sistema prototipale multisorgente INtegrante tecniche di Osservazione multispettrale da satellite, aeromobile e a terra per il monitoraggio multi-scala della variazione di Indicatori ambientali legata ai costituenti Atmosferici e dispersione Energetica*” funded by the Italian Ministry of University and Research and Regione Lombardia in the program “*Progetti di Ricerca Industriale e Sviluppo Sperimentale per i settori strategici di Regione Lombardia*”. (Scientific director for Politecnico di Milano Prof. Raffaella Brumana).
- 2012 - 2014 **Principal Investigator** for the Department of Electronics and Information in the project “*Un Masterplan innovativo, aperto e digitale per gestire concretamente progetto Città Studi Campus Sostenibile*” funded by Politecnico di Milano under the “*5 per 1000*” program. (Scientific director Prof. Alberto Longo).
- 2011 - 2013 **National Coordinator** of PRIN 2009 project “*ROAMFREE: Robust Odometry Applying Multisensor Fusion to Reduce Estimation Errors*” funded by the Italian Ministry of University and Research. (<http://roamfree.dei.polimi.it>).
- 2006 - 2009 **Project Coordinator** of the the sixth framework (FP6) project “*RAWSEEDS: Robotics Advancement through Web-publishing of Sensorial and Elaborated Extensive Data Sets*”. European Project FP6-045144. (<http://www.rawseeds.org>).
- 2007 - 2008 **Principal Investigator** grantee of “*Brain-Computer Interfaces in Everyday Applications*” grant by Politecnico di Milano and Regione Lombardia (within the joint program “*Grant di Avvio alla*”).

- Ricerca - Accordo di Collaborazione tra il Politecnico di Milano e la Regione Lombardia").
- 2006 - 2008 **Investigator** in the Workpackage "Robotic Companion Exploiting Affective Feedback for Modeling Emotional State of the Patient and Adapting the Rehabilitation Treatment" of the IIT Funded Project on Rehabilitation within the Politecnico di Milano IIT Unit. (Scientific director of the workpackage Prof. Andrea Bonarini).
- 2003 - 2005 **Investigator** in the PRIN project MADSys "Sviluppo di metodologie e strumenti per lo sviluppo di comunità di agenti robotici" funded by the Italian Ministry of University and Research (MIUR). (Project coordinator Prof. Andrea Bonarini).
- 2002 - 2003 **Principal Investigator** (Grantee) of "Adattatività in ambienti dinamici tramite transductive learning e boosting" grant funded by the "Young Researcher" initiative at Politecnico di Milano.

Industrial Projects and Contracts

- 2020 **Principal Investigator** in the research project "Sviluppo prototipale di un algoritmo per l'identificazione di tag olografici anti contraffazione tramite intelligenza artificiale" with Tracetoo Srl
- 2019 **Co-Principal Investigator** for the teaching contract "Deep learning per l'analisi di immagini" with Advanced Global Solutions SpA (AGS)
- 2019 **Co-Principal Investigator** in the research project "Algoritmi per stimare automaticamente l'omografia che mappa il piano del campo dallo spazio 3D ad un video acquisito da uno smartphone" with MOXOFF SpA.
- 2018 - 2019 **Principal Investigator** in the research project "Sistema di Acquisizione di Diagrammi Unifilari: definizione di architettura e specifiche del sistema di riconoscimento" with ABB SpA.
- 2018 - 2019 **Principal Investigator** in the research project "Studio sistema navigazione indoor basato su dispositivo DJI guidance" with ENI SPA and ENIProgetti (formerly Tecnomare).
- 2018 - 2019 **Investigator** in the research project "3D MADNex - 3D Multidimensional Analysis Nexus" with ENI SPA. (Principal investigator Prof. Stefano Tubaro)
- 2018 **Principal Investigator** in the research project "Studio ed identificazione delle architetture software per sistemi robotici, con particolare attenzione a ROS e OROCOS" with ENIProgetti (formerly Tecnomare).
- 2017 - 2018 **Investigator** in the research project "Studio di fattibilità per lo sviluppo di un drone per la ricerca di emissioni fuggitive" with ENI Progetti (formerly Tecnomare). (Principal investigator Prof. Marco Lovera)
- 2017 - 2018 **Investigator** in the research project "Attività di R&D sull'analisi e lo sviluppo di algoritmi e modelli predittivi per l'anticipazione di fenomeni associati a Non Productive Time nelle attività di perforazione Eni" with ENI SPA. (Principal investigator Prof. Luigi Piroddi)
- 2017 - 2018 **Principal Investigator** in the research project "Supporto nella progettazione e nello sviluppo di un sistema di guida autonoma per un veicolo elettrico autonomo" with Elettronica ASTER SPA.
- 2013 - 2018 **Principal Investigator** for Politecnico di Milano in the "Gara per l'affidamento di un appalto pre-commerciale ai sensi dell'art.19 co.1 lett. F) del D.LGS.N. 163/2016 relativo a servizi di ricerca industriale e sviluppo sperimentale funzionali alla realizzazione di un nuovo sistema universale per traino dei letti di degenza" with ARCA (Agenzia Regionale Centrali Acquisti) Regione Lombardia.
- 2016 **Investigator** in the research project "Fornitura di un software all'interno di una cella robotica e specifica assistenza alla Fiera Automatica di Monaco" with COMAU SpA. (Principal investigator Prof. Luca Bascetta)
- 2015 - 2016 **Principal Investigator** in the research project "Realizzazione di una interfaccia cervello-computer basata su potenziale P300" with Infosolution SpA in the project "STELE: telemonitoraggio e autonomia nell'assistenza domiciliare dei pazienti di patologie neurodegenerative" funded by FILAS SpA.
- 2012 - 2013 **Principal Investigator** in the research project "Studio fattibilità software di programmazione

- off-line*” with Gaiotto Automation SpA.
- 2010-2013 **Investigator** in the research contract “*QUADRIVIO*” with AEROSEKUR in the project “*QUADRIVIO*” funded by FILAS SpA. (Scientific director Prof. Gianantonio Magnani).
- 2010-2013 **Principal Investigator** in the research project “Realizzazione di una interfaccia cervello-computer basata su potenziale P300” with Infosolution SpA in the project “ON: monitoraggio e autonomia nella assistenza domiciliare dei pazienti affetti da SLA” funded by FILAS SpA.
- 2009-2013 **Investigator** in the workpackage “*Intelligenza di prodotto*” of project Industria 2015 n. EE01_00015 “*Studio, progettazione e sviluppo di una nuova gamma di elettrodomestici caratterizzata da tecnologie innovative mirate a una notevole riduzione dei consumi energetici e dell’impatto ambientale*” funded by Ministero dello Sviluppo Economico. (Scientific director of the work package prof. Andrea Bonarini).
- 2009-2012 **Investigator** in the research project “*Metodi statistici e di machine learning per lo sviluppo automatico di ontologie di dominio*” with Noustat S.r.l. (Scientific director prof. Andrea Bonarini).
- 2009-2010 **Investigator** in the research contract “Valutazione dell’efficacia della politica regionale di assegnazione agli E.E.L.L. di risorse finanziarie, in forme concertate, per interventi di sicurezza stradale e analisi dell’efficienza funzionale” funded by Regione Lombardia (Scientific director Prof. Lorenzo Mussone).

Professional Activities

- 04/2007 - 09/2007 Research Contract for the development of a Neural tool for sport engine diagnosis for an Italian Company (company name undisclosed for NDA clause).
- 12/2006 - 05/2007 Research Contract for consultancy on Emotion detection from biosignals for an Italian Research Center (company name undisclosed for NDA clause).
- 06/2000 - 09/2000 Special Research Contract: Ottimizzazione di paradigmi neurali per l’elaborazione di immagini, Politecnico di Milano, Department of Electronics and Information (Milan, Italy).
- 03/2000 - 04/2000 Special Research Contract: Progetto e prototipazione di un’architettura behavior based per robot autonomi, Politecnico di Milano, Department of Electronics and Information (Milan, Italy).
- 10/1999 - 11/1999 Special Research Contract: Sviluppo sistema per l’analisi di algoritmi di apprendimento , Politecnico di Milano, Department of Electronics and Information (Milan, Italy).

Research Statement

Autonomous systems are systems able to plan, perceive, and act, so to affect their surrounding environment without the need for human intervention. Classical examples are autonomous robots, unmanned vehicles, but also (ambient) assistive technologies where system autonomy is used to supply user deficits being either physical or cognitive. Out of the three activities of an autonomous system, perception is the main limiting factor for autonomous systems aiming at being deployed in the real world in a robust, adaptive, and reliable way.

My research in autonomous perception has focused on the use of techniques and models from Pattern Recognition, Machine Learning, Signal Processing, and Dynamic State Estimation for dealing with uncertainty in perception so to allow autonomous systems to perceive their environment effectively (i.e., being able to cope with sensor uncertainty and incomplete knowledge). In doing this, three real-world scenarios have been investigated: environment perception from an autonomous robot, user state/intent perception by and autonomous system, perception of the environment by a set of distributed sensors.

In the following the results of my research in autonomous system perception and intelligent data analysis, also known as machine learning, are described together with their current a future research perspective; selected references to relevant publications are given while the full list of my publications is reported afterwards.

Research Achievements, Results, and Products

MRT: the Milan RoboCup Team

From 2001 to 2009, after graduation, I participated to the Milan Robocup Team (MRT - <http://robocup.elet.polimi.it/MRT/>) a Robocup (<http://www.robocup.org/>) team of six autonomous soccer robots; my contribution in terms of algorithms and models was related to custom panoramic vision sensors [B12], adaptive color classification algorithms [B11][B7], and a conceptual model to integrate robot perception with information from teammates based on fuzzy logic [A8][A5]. The behavior of the robots was implemented using BRIAN, a system able to manage the interaction among fuzzy behavioral modules, which I designed at the beginning of my PhD [A2]. This research gave me the opportunity to develop and verify “on the field” the technologies and methodologies I developed to make perception algorithms able to deal with dynamic and non stationary environments. To cope with the complexity of designing and maintaining a team or robots, I worked at the design of the message oriented middleware “Device Communities Development Toolkit” (DCDT) [B13][D5], which has been used to program the MRT robots. After the RoboCup experience, and because of it, I pursued research in developing modular and flexible tools and methodologies for the rapid prototyping of low-cost (service) robots. The last result is Rapid Robot Prototyping (R2P), a framework for the programming and integration of embedded systems in robotics (e.g., motor control board, inertial measurement unit, sonar sensors, etc.), which sports a publish/subscribe communication paradigm integrated over the CAN fieldbus [A27]. Beside being an effective design methodology, as testified by the different robot realized with it, R2P is currently at a mature stage and we are now planning to present it as a commercial open source project. In 2015, based on the outcome of the research on the Robot Rapid Prototyping framework a Spin-off has been founded, namely Nova Labs, for the commercialization and the customization of the Robot Rapid Prototyping tools. My research on modular and component based robotics has now moved to the software aspects of complex systems leveraging the tool of model based development [A46].

LURCH: an Autonomous Wheelchair with Multimodal Interfaces

In 2007 I started the LURCH project for the development of an autonomous wheelchair, which could help people unable to move autonomously [B17]. This effort has resulted in an autonomous wheelchair, which sports the “shared autonomy” design paradigm: depending on the needs of the user, the robot supplies the needed autonomy from simple safety enhancer up to fully autonomous vehicle [D100]. Having the user at the center of the robot design, beside the capabilities needed for autonomous operation, I decided to design several human computer interfaces for the autonomous wheelchair ranging from the simple ones (e.g., touch screen GUI or electromyographic sensor) to the most innovative ones (e.g., a Brain Computer Interface based on Event Related Potentials) [D56]. The project has reached the maturity of an industrial prototype and this has been recognized by the two prizes (Antonio D’Auria SIRI Prize and Intesa San Paolo “Startup Initiative” award) obtained by its RobyWheelChair industrial counterpart developed together with the industrial partner Infosolution SpA. The competences built during the development of LURCH prototype have been the base for the project “ALMA: Aging without Losing Mobility and Autonomy” aimed at deploying two autonomous wheelchairs in real scenarios and at finalizing an industrial prototype (funded under the European Ambient Assisted Living (AAL) Joint Program). The LURCH prototype in now become a more mature product named Personal Mobility Kit (PMK) demonstrated in several public events.

Simultaneous Localization and Mapping in Autonomous Robots and Unmanned Vehicles

In the field of incremental building of maps and localization for autonomous robots in unknown environments I worked, in cooperation with Università degli Studi di Milano - Bicocca, on the development of a complete SLAM (i.e., Simultaneous Localization and Mapping) system in six degrees of freedom based on trinocular and monocular vision sporting hierarchical map decomposition [D46][D34][D35]. In particular, I applied my background in statistics and modeling to the various aspects of localization, simultaneous localization and mapping, and data association with specific interests in error modeling [D88][D71][D61]. Then I worked on a Visual SLAM system with multiple cameras able to build large scale visual maps (hundreds of meters, thousands of features) in real-time based on the Conditional Independence SLAM technique [A28]. This Visual SLAM system has then been combined with other odometric estimates through the ROAMFREE framework, a methodology we developed to perform multi odometric sensor fusion (e.g., inertial measurement units, laser range finder, single and multiple camera systems, etc.), to obtain an accurate and robust perception of the robot path [D104]. The resulting system has been deployed on the indoor robots at the AIRLab (e.g., the autonomous wheelchair LURCH), and in outdoor unmanned vehicles such as the QUADRIVIO all terrain robot at MERLIN (MERLIN (MEchatronics and Robotics Laboratory for INnovation - Politecnico di Milano) [D99].

Benchmarking and Good Experimental Methodologies in Autonomous Robots

The development of novel methods and techniques in intelligent systems needs a proper methodology for the evaluation of real advancements in research; however, the field of Benchmarking and Good Experimental Methodologies in Robotics is still in its infancy. I have been actively involved in the design of suitable benchmarks and good experimental methodologies for intelligent systems, in particular, for the benchmarking of Simultaneous Localization and Mapping systems through the coordination of the FP6-045144 European project RAWSEEDS for the creation of a Multi Sensor Benchmark for Simultaneous Localization and Mapping (www.rawseeds.org) [A10][B18][D38]. Since its constitution I have been part of the Euron Special Interest Group on Good Experimental Methodologies and Benchmarking (GEM SIG) and I worked on the writing of the “*General Guidelines for Robotics Papers Involving Experiments*” for the chapter regarding papers on “*Simultaneous Localization And Mapping*” (www.heronrobots.com). I participated as External Expert to the FP7 RoSta (Robot Standards) project in the benchmarking workpackage (wiki.robot-standards.org), and I have been Politecnico di Milano Principal Investigator for the FP7-ICT-601012 European project RoCKIn (www.rockinrobotchallenge.eu) for the design and execution of two international competitions for the benchmarking of autonomous robots in the home environment (RoCKIn@Home) and at work (RoCKIn@Work). I have been part of the IEEE RAS Standard Group which has defined IEEE P1873/D1 Standard for Robot Map Data Representation for Navigation [A49], and founder member of the euRobotics AISBL (the Private counterpart of the Robotics PPP being the European Commission the Public one) Topic Group on “Evaluation of Research Results: Result Replication, Benchmarking, Challenges and Competitions”. This research field on good experimental methodologies in robotics has recently been at the center of the Horizon 2020 ICT Call on Robotics and I have been invited by a EC Project Officer to give a talk at a Workshop at the European Robotics Forum on “*Benchmarking in Robotics: Challenges and Visions*” to share my past experience.

P300 + ErrP BCI: a Self-Correcting Brain-Computer Interface

While developing the autonomous wheelchair LURCH, lot of effort has been directed to the development of effective human robot interfaces, the most challenging one being an Event Related Brain-Computer Interface. In the years from 2007 to 2009 I studied an interface able to capture the user intent from brain activity so to transfer this intent to the autonomous wheelchair or to enable people suffering severe pathologies (e.g., Amyotrophic Lateral Sclerosis) to communicate. The result of this research activity has been the first Brain Computer Interface integrating the classical P300 event related potential and the ErrP error potential [A25][A13]. In the winter of 2009 this BCI was used to control the autonomous wheelchair and

this had quite resonance on the press (<http://airwiki.elet.polimi.it/index.php/MediaCoverage>). To evaluate the effectivity of this novel self-correcting paradigm I have worked on a novel metric for the performance evaluation of a Brain-Computer Interface [A16][A32], which could be applied as a methodology for the evaluation of pattern recognition based interfaces used as assistive devices (e.g., gesture recognition), and to be used within the design cycle of a machine-user interface based on pattern recognition. In the past I was already involved in the development of communication systems for disabled people applying machine learning techniques for developing symbolic language prediction models for Alternative and Augmentative Communication [B8][B5] so I have applied these techniques also to the Brain-Computer Interface field in order increase the effectiveness of a Motor Imagery Brain-Computer Interface [A22].

Bioinformatics, Biosignal Interpretation, and Affective Computing

Beside clinical and end-user involvement (e.g., Ospedale S. Camillo di Venezia, Policlinico di Roma), my research activity on Brain-Computer Interfaces has been conducted in collaboration with researchers from the (former) Bioengineering Department of Politecnico di Milano and this gave birth to a series of fruitful collaborations on biosignal interpretations too. In particular I have contributed with my expertise in machine learning and pattern recognition to the development of algorithms for the detection of Obstructive Sleep Apnea [A14][A12] and the classification of sleep stages [A15] from ECG signals. My experience on EEG signal analysis (from Brain-Computer Interface research) has been applied also to the development of an automated technique for the detection of Cyclic Alternating Patterns in sleep [A23][A20]. Out of these collaborations, came my interest in Affective Computing, i.e., the study and development of systems and devices that can recognize, interpret, process, and simulate human affects [D92][D77]. The research on this field has led two of my PhD students in starting up a company, Empatica S.r.l. (www.empatica.com), which produces a portable device (wristband) for the detection of user stress and emotions. In this field I have been mostly interested in the methodological aspects of experiment design and validation in affective computing experiments [D90]. In the last few years, I have been involved by the research group on Genomic Computing of Politecnico di Milano led by prof. Stefano Ceri in applying machine learning techniques to genomic data, our research has led to international publications on top venues on statistical analysis [A36], signal processing [A42], data visualization [A45], efficient data handling, indexing, and retrieval [A44][A52].

VeTRA: a Model-based Multi Camera Vehicle Tracking System

Since 2008 I have been interested in visual tracking and user behaviour analysis. Beside specific advancements in background subtraction [A29][D36], the most relevant result is the development of VeTRA, a visual tracking system composed of multiple synchronized cameras for the analysis and the 3D reconstruction of vehicle traffic in roundabout intersections [A30]. VeTRA is able to reconstruct the 3D trajectory of vehicles, their type and their dimensions; the system has been evaluated on real data collected during a field survey for the evaluation of the roundabout effectiveness on behalf of Regione Lombardia. VeTRA is one of the tools developed within a methodology for the evaluation of the effectiveness of different road intersections in a transport system design [A26][A24].

Geometry of Information in Estimation of Distribution Algorithms

Because of my background in statistics I have always used tools from Bayesian inference in autonomous systems perception and intelligent data analysis. I also applied those tools to Genetic Algorithms by proposing a Bayesian extension to Learning Classifier Systems in dealing with uncertainty [D32]. That is why I immediately found myself intrigued by the Estimation of Distribution Algorithm (EDA) approach in evolutionary computation. Because of their use of directed and undirected graphical models from Statistics EDAs allow a principled theoretical analysis of the way optimization is performed in this class of evolutionary algorithms. With a colleague from the Mathematics Department of Politecnico di Torino and a co-tutored PhD Student we have proved some theorems on the (Information) Geometry of Estimation Distribution

Algorithms based on models from the exponential family [D72][D81] and their relationship with natural gradient descent and Gibbs samplers [D106]. This highly theoretical work has nevertheless lead to novel techniques in the Estimation of Distribution Algorithm field capable of learning the models to be exploited in the optimization process by leveraging on their Information Geometry properties [D97][D93].

Invited Talks and Papers

- Invited talk titled “Robotics and Farming: Technologies & Innovations for an Agriculture 4.0” at the 2nd Annual Automation & Robotics for Non-Road Applications, Gothia Towers, Gothenburg, 13th of December 2019
- Invited talk titled “AI applied to 5G: Learning Methods for Channel Estimation” at the Huawei Workshop on High Frequency Technologies for 5G, Politecnico di Milano, Milan, 18th of November 2019
- Invited talk titled “Intelligent robots are at the door ... but can they open it?” at the Sciroc-AI4EU joint Workshop on Evaluation and Benchmarking of Human-Centered AI Systems, Milton Keynes, 20th September 2019
- Invited talk titled “Dai Big Data ai Sistemi di Autoapprendimento” hosted by Fondazione Faraggiana, Novara, 15th of October, 2019.
- Invited talk titled “Intelligenza artificiale: ambiti applicativi e impatto sui sistemi industriali” hosted by ANIE as part of “Master ANIE per Industria 4.0”, Milano, 11th of June, 2019.
- Invited talk titled “*Intelligenza artificiale: ambiti applicativi e impatto sui sistemi industriali*” hosted by APITech as part of the event “INTELLIGENZA ARTIFICIALE E SISTEMI INDUSTRIALI: Applicazioni nel contesto Impresa 4.0”, Lecco, 4th of February, 2019.
- Invited talk titled “*Cosa intendiamo per IA ... tutto ciò che avreste voluto sapere e non avete mai osato chiedere.*” at Convegno “INTELLIGENZA ARTIFICIALE E RICERCA CLINICA”, Milan, 18th of September 2018 <https://www.advicepharma.com/intelligenza-artificiale-e-ricerca-clinica/>
- Invited talk titled “*A che punto siamo con le tecnologie dell’AI e il loro futuro possibile*” at Convegno “AI TECH CONFERENCE: Artificial Intelligence per le imprese e per un mondo migliore”, Milan, 5th of July 2018
- Invited talk titled “*Sul senso (comune) dei Big Data*” at Convegno “*Big Data e Robotica nella fabbrica digitale connesso*”, Milan, 30th of November 2017
- Invited talk titled “*AI and Cognitive Technology: Why, What, How ...*” at the Cognitech Conference, Milan, 29th of March 2017
- Invited talk titled “*The RAWSEEDS Project: How we did it!*” at the CHIST-ERA Conference on “Object recognition and manipulation by robots: Data sharing and experiment reproducibility”, Krakov, 21st of June 2017
- Invited talk titled “*Modular development of service robots: from Rapid Robot Prototyping to Nova Core*” in the Sessione Specialistica “Robot & Co.” at A&T 2016, Torino, 21st of April 2016
- Invited talk titled “*Do Big Data make (common) sense?*” at Convegno “L’automazione nell’era dei Big Data: scenari e prospettive”, at MECSPE, Parma, 18th of March 2016
- Invited talk titled “*Do we really need to replicate experiments?*” in the “Open forum on evaluation of results, replication of experiments and benchmarking in robotics research” at the 2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2015), on 28th of September 2015
- Invited talk titled “*The RAWSEEDS Project: How we did it!*” at the 2015 IEEE-RAS Summer School on Experimental Methodology, Performance Evaluation and Benchmarking in Robotics on 15th of September 2015
- Invited talk titled “*Benchmarking and Competitions*” at the 2015 IEEE-RAS Summer School on Experimental Methodology, Performance Evaluation and Benchmarking in Robotics on 15th of September 2015
- Invited presentation titled “*RoCKIn: Driving Robotics Forward through Collaboration, Benchmarking and Competition*” in the Forum on “Robotics Challenges and Competitions” at the 2014 IEEE International Conference on Robotics and Automation (ICRA 2014), on 4th of June 2014.

- Invited presentation titled “*Benchmarking in Robotics: Challenges and Visions*” in the Workshop “Shared infrastructures, benchmarking and performance evaluation” at the 2014 European Robotics Forum (ERF) on 12th of March 2014.
- Invited presentation titled “*Benchmarking through competitions*” to the EuRoC Challenge Design Workshop on 23rd of January 2014.
- Invited presentation titled “*The Utility Metric*” to the Workshop on “BCI Performance Metrics” held during the 5th International BCI Meeting from June 3rd - June 7th, 2013. Submitted to the Journal of Neural Engineering as part of the contribution “Performance Measurement for Brain-Computer or Brain-Machine Interfaces: A Tutorial”.
- Invited seminar (26/01/2012) “*Integrating P300 and Error Potentials in a Single BCI: Algorithms, Techniques & Performance Assessment*” in the seminar program “Bioengineering Seminar Series” at the Department of Bioengineering of Politecnico di Milano
- Invited paper at the 18th World Congress of International Federation of Automatic Control “*On Feature Parameterization for EKF-based Monocular SLAM*”, in the Special Session on SLAM
- Invited paper at the 5th Symposium on Intelligent Autonomous Vehicle “*A model to manage data reliability in behavior-based robotics*”.

Full List of Publications

A. Articles in International Journals¹

- A57. Alessandro Brusafferri, Matteo Matteucci, Stefano Spinelli, Andrea Vitali. “*Learning behavioral models by recurrent neural networks with discrete latent representations with application to a flexible industrial conveyor*”. Computers in Industry, *in press*. 2020. **Q1**
- A56. Alessandro Brusafferri, Matteo Matteucci, P Portolani, A Vitali. “*Bayesian deep learning based method for probabilistic forecast of day-ahead electricity prices*”. Applied Energy 250, p. 1158-1175. 2019. **Q1**
- A55. Andrea Romanoni, Matteo Matteucci. “*Mesh-based camera pairs selection and occlusion-aware masking for mesh refinement*”. Pattern Recognition Letters 125, p. 364-372. 2019. **Q1**
- A54. Meysam Basiri, Enrico Piazza, Matteo Matteucci, Pedro Lima. “*Benchmarking Functionalities of Domestic Service Robots Through Scientific Competitions*”. KI - Künstliche Intelligenz 33, 33, pages 357-367, doi: 10.1007/s13218-019-00619-9, 2019.
- A53. Francesco Lattari, Borja Gonzalez Leon, Francesco Asaro, Alessio Rucci, Carlo Prati, Matteo Matteucci. “*Deep Learning for SAR Image Despeckling*”. Remote Sensing 11 (13), 1532. 2019. **Q1**
- A52. Vahid Jalili, Matteo Matteucci, Jeremy Goecks, Yashar Deldjoo, Stefano Ceri. “*Next Generation Indexing for Genomic Intervals*”. IEEE Transactions on Knowledge and Data Engineering, doi: 10.1109/TKDE.2018.2871031, 2018. **Q1**
- A51. Gianluca Bardaro, Luca Bascetta, Marcello Farina, Matteo Matteucci. “*MPC-based control architecture of an autonomous wheelchair for indoor environments*”. Control Engineering Practice, vol.78, p.160-174. 2018. **Q1**
- A50. Francesco Amigoni, Wonpil Yu, Torsten Andre, Dirk Holz, Martin Magnusson, Matteo Matteucci, Hyungpil Moon, Masashi Yokozuka, Geoffrey Biggs, Raj Madhavan. “*A Standard for Map Data Representation: IEEE 1873-2015 Facilitates Interoperability Between Robots*”. IEEE Robotics and Automation Magazine, 25(1):65-76, ISSN: 1070-9932, doi: 10.1109/MRA.2017.2746179. 2018. **Q2/Q1**
- A49. Fabio Veronese, Andrea Masciadri, Sara Comai, Matteo Matteucci, Fabio Salice. “*Behavior Drift Detection Based on Anomalies Identification in Home Living Quantitative Indicators*”. Technologies, vol. 6, p. 1-15, ISSN: 2227-7080, doi: 10.3390/technologies6010016. 2018.
- A48. Enrico Piazza, Andrea Romanoni, Matteo Matteucci. “*Real-Time CPU-Based Large-Scale Three-Dimensional Mesh Reconstruction*”. IEEE Robotics and Automation Letters, vol. 3, p.

¹ I report the SJR (Scimago Journal & Country Rank <https://www.scimagojr.com/>) quartiles for the year of publication of the paper, or the year before if not yet available. When the journal has multiple subjects the quartile(s) of the subject(s) appropriate for the paper topic is(are) reported.

- 1584-1591, ISSN: 2377-3766, doi: 10.1109/LRA.2018.2800104. 2018.
- A47. Daniel Sinkonde, Leonard Mselle, Nima Shidende, Sara Comai, Matteo Matteucci. *“Developing an Intelligent PostGIS Database to Support Accessibility Tools for Urban Pedestrians”*. Urban Science, 2(3):52, doi: 10.3390/urbansci2030052. 2018.
- A46. Gianluca Bardaro, Andrea Semprebon, Matteo Matteucci. *“AADL for robotics: a general approach for system architecture modeling and code generation”*. Journal of Software Engineering in Robotics, vol. 8, p. 32-44, ISSN: 2035-3928. 2017.
- A45. Vahid Jalili, Matteo Matteucci, Marco Masseroli, Stefano Ceri. *“Explorative visual analytics on interval-based genomic data and their metadata”*. BMC BIOINFORMATICS, vol. 18, p. 1-15, ISSN: 1471-2105, doi: 10.1186/s12859-017-1945-9. 2017. **Q1**
- A44. Vahid Jalili, Matteo Matteucci, Marco Masseroli, Stefano Ceri. *“Indexing Next-Generation Sequencing data”*. Information Sciences, vol. 384, p. 90-109, ISSN: 0020-0255, doi: 10.1016/j.ins.2016.08.085. 2017. **Q1**
- A43. Sara Comai, Emanuele De Bernardi, Matteo Matteucci, Fabio Salice. *“Maps for Easy Paths (MEP): Accessible Paths Tracking and Reconstruction”*. EAI Endorsed Transactions on Internet of Things, vol.3, p.1-10, ISSN: 2414-1399, doi: 10.4108/eai.31-8-2017.153050. 2017.
- A42. Vahid Jalili, Matteo Matteucci, Marco J. Morelli, Marco Masseroli. *“MuSERA: Multiple sample enriched region assessment”*. Briefings in Bioinformatics, vol.18, p.367-381, ISSN: 1467-5463, doi: 10.1093/bib/bbw029. 2017. **Q1**
- A41. Fabio Veronese, Andrea Masciadri, Anna A. Trofimova, Matteo Matteucci, Fabio Salice. *“Realistic human behaviour simulation for quantitative ambient intelligence studies”*. Technology and Disability, vol. 28, p. 159-177, ISSN: 1055-4181, doi: 10.3233/TAD-160453. 2017.
- A40. Giulio Vitale, Andrea Bonarini, Matteo Matteucci, Luca Bascetta. *“Toward vocational robotics”*. IEEE Robotics and Automation Magazine, vol. 23, p. 73-81, ISSN: 1070-9932, doi: 10.1109/MRA.2016.2571998. 2016. **Q2/Q1**
- A39. Simone Mangano, Hassan Saidinejad, Fabio Veronese, Sara Comai, Matteo Matteucci, Fabio Salice. *“Bridge: Mutual Reassurance for Autonomous and Independent Living”*. IEEE INTELLIGENT SYSTEMS - ISSN:1541-1672 vol. 30 (4), pp.31-38. DOI:10.1109/MIS.2015.58. 2015. **Q2/Q1**
- A38. Francesco Amigoni, Emanuele Bastianelli, Jakob Berghofer, Andrea Bonarini, Giulio Fontana, Nico Hochgeschwender, Luca Iocchi, Gerhard K. Kraetzschmar, Pedro Lima, Matteo Matteucci, Pedro Miraldo, Daniele Nardi, Viola Schiaffonati. *“Competitions for Benchmarking. Task and Functionality Scoring Complete Performance Assessment”*. IEEE Robotics and Automation Magazine ISSN:1070-9932 vol. 22 (3) pp.53-61. DOI:10.1109/MRA.2015.2448871. 2015. **Q1**
- A37. Andrea Romanoni, Domenico G. Sorrenti, Matteo Matteucci. *“Backward-Simulation Particle Smoother with a hybrid state for 3D vehicle trajectory, class and dimension simultaneous estimation”*. Machine Vision and Applications, Volume 26(2-3):369-385, Springer Berlin Heidelberg, 2015. DOI:[10.1007/s00138-015-0668-z](https://doi.org/10.1007/s00138-015-0668-z) **Q2/Q1**
- A36. Jalili Vahid, Matteo Matteucci, Marco Masseroli, Marco J. Morelli. *“Using combined evidence from replicates to evaluate ChIP-seq peaks”*. BIOINFORMATICS - ISSN:1367-4803 vol. 31 (17), pp. 2761-2769. DOI:10.1093/bioinformatics/btv293. 2015. **Q1**
- A35. Adnan Tahirovic, Matteo Matteucci, Luca T Mainardi. *“An Averaging Technique for the P300 Spatial Distribution”*. Methods of Information in Medicine, Volume 54(3):215-220, Schattauer Publishers, 2015. DOI:[10.3414/ME13-02-0037](https://doi.org/10.3414/ME13-02-0037)
- A34. Gianpaolo Cugola, Alessandro Margara, Matteo Matteucci, Giordano Tamburrelli. *“Introducing Uncertainty in Complex Event Processing: Model, Implementation, and Validation”*. Computing, Volume 97(2):103-144, Springer Vienna, 2015. (First published online 4th May 2014). DOI:[10.1007/s00607-014-0404-y](https://doi.org/10.1007/s00607-014-0404-y)
- A33. Andrea Romanoni, Lorenzo Mussone, Davide Rizzi, Matteo Matteucci. *“A comparison of two Monte Carlo algorithms for 3D vehicle trajectory reconstruction in roundabouts”*, Pattern Recognition letters, Volume 51:79-85, January 2015, DOI: 10.1016/j.patrec.2014.09.003 **Q1**
- A32. Davide Antonio Cucci, Matteo Matteucci. *“On the Development of a Generic Multi-Sensor Fusion Framework for Robust Odometry Estimation”*. Journal of Software Engineering for Robotics (JOSER),

Special Issue on “Best Practice in Robotic Software Development”, Volume 5(1):48-62, ISSN 2035-3928, 2014.

- A31. D. E. Thompson, L. R. Quitadamo, L. Mainardi, K. U. Laghari, S. Gao, P. J. Kindermans, J. D. Simeral, R. Fazel-Rezai, Matteo Matteucci, T. H. Falk, L. Bianchi, C. A. Chestek, J. E. J. Huggins. “Performance measurement for brain-computer or brain-machine interfaces: a tutorial”. Journal of Neural Engineering. Volume 11(3):035001, June 2014. DOI: [10.1088/1741-2560/11/3/035001](https://doi.org/10.1088/1741-2560/11/3/035001) **Q1**
- A30. Lorenzo Mussone, Matteo Matteucci, Marco Bassani, and Davide Rizzi. “An innovative method for the analysis of vehicle movements in roundabouts based on image processing”. Journal of Advanced Transportation 47(6):581–594, 2013. DOI: [10.1002/atr.184](https://doi.org/10.1002/atr.184) **Q1**
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- D56. Davide Migliore, Rossella Blatt, Matteo Matteucci, Simone Ceriani, Giulio Fontana, and Bernardo Dal Seno. "*Brain Control of a Smart Wheelchair*". Proceedings of Intelligent Autonomous Systems pp. 221--228, JULY, 2008.
- D55. Bernardo Dal Seno, Matteo Matteucci, Luca T Mainardi, F Piccione, and Stefano Silvoni. "*Single-trial P300 detection in healthy and ALS subjects by means of a genetic algorithm*". Proceedings of the 4th International Brain-Computer Interface Workshop & Training Course pp. 104--109, September, 2008.
- D54. Gianmaria Visconti, Bernardo Dal Seno, Matteo Matteucci, and Luca T Mainardi. "*Automatic*

- recognition of error potentials in a P300-based brain-computer interface*". Proceedings of the 4th International Brain-Computer Interface Workshop & Training Course pp. 238--243, September, 2008.
- D53. Bernardo Dal Seno, Luca T Mainardi, and Matteo Matteucci. "*Assessing the performance of a BCI: A task-oriented approach*". Proceedings of the 4th International Brain-Computer Interface Workshop & Training Course pp. 274--279, September, 2008.
- D52. Vincenzo Rana, Matteo Matteucci, Daniele Caltabiano, Roberto Sannino, and Andrea Bonarini. "*Low cost smartcam design*". Proceedings of 6th IEEE Workshop on Embedded Systems for Real-time Multimedia (ESTIMedia 2008) pp. 27--32, Los Alamitos, CA, USA -- USA, October, 2008.
- D51. Rossella Blatt, Andrea Bonarini, Elisa Calabró, Matteo Matteucci, Matteo Della Torre, Ugo Pastorino. "*Pattern Classification Techniques for Early Lung Cancer Diagnosis using an Electronic Nose*". Proceedings of ECAI – Prestigious Applications of Artificial Intelligence (PAIS) @1:693--697, JULY, 2008.
- D50. Luigi Malago', Matteo Matteucci, and Bernardo Dal Seno. "*An Information Geometry Perspective on Estimation of Distribution Algorithms: Boundary Analysis*". pp. 2081--2088, July, 2008.
- D49. Giulio Fontana, Matteo Matteucci, Domenico G Sorrenti. "*The RAWSEEDS Proposal for Representation-Independent Benchmarking of SLAM*". GEMBENCH 2008, pp. 1--6, 2008.
- D48. Andrea Bonarini, Matteo Matteucci, and Simone Tognetti. "*Chest expansion reconstruction from respiration sound by using artificial neural networks*". Proceedings of 4th IET International Conference on Advances in Medical, Signal and Information Processing (MEDSIP 2008). pp. 126--129, LOS ALAMITOS CA -- USA, July, 2008.
- D47. Paolo Cremonesi, Roberto Turrin, Eugenio Lentini, and Matteo Matteucci. "*An Evaluation Methodology for Collaborative Recommender Systems*". International Conference on Automated solutions for Cross Media Content and Multi-channel Distribution pp. 224--231, November, 2008.
- D46. Daniele Marzorati, Matteo Matteucci, Domenico Giorgio Sorrenti. "*Particle-based Sensor Modeling for 3D-Vision SLAM*". In proceedings of IEEE International Conference on Robotics and Automation (ICRA) pp. 4801-4806, April, 2007. **Class 2 (A)**
- D45. Daniele Marzorati, Matteo Matteucci, Davide Antonio Migliore, Domenico Giorgio Sorrenti. "*Integration of 3D Lines and Points in 6DoF Visual SLAM by Uncertain Projective Geometry*". In proceedings of European Conference on Mobile Robotics (ECMR) pp. 96-101, 2007.
- D44. Fabio Antonacci, Matteo Matteucci, Davide Antonio Migliore, D Riva, Augusto Sarti, Marco Tagliasacchi, and Stefano Tubaro. "*Tracking Multiple Acoustic Sources in Reverberant Environments using Regularized Particle Filter*". In proceedings of 15th International Conference on Digital Signal Processing pp. 99-102, 2007.
- D43. Rossella Blatt, Andrea Bonarini, Elisa Calabró, Matteo Della Torre, Matteo Matteucci, and Ugo Pastorino. "*Fuzzy k-NN Lung Cancer Identification by an Electronic Nose*". Applications of Fuzzy Sets Theory LNCS 4578/2007:261-268, August, 2007.
- D42. Rossella Blatt, Andrea Bonarini, Elisa Calabro, Matteo Della Torre, Matteo Matteucci, and Ugo Pastorino. "*Lung Cancer Identification by an Electronic Nose based on an Array of MOS Sensors*". In proceedings of International Joint Conference on Neural Networks (IJCNN) pp. 1423-1428, August, 2007. **Class 3 (B)**
- D41. Lorenzo Mussone, and Matteo Matteucci. "*An application of ant colony systems for DUE and SUE assignment in congested transportation networks*". In proceedings of 11th of World Conference on Transportation Research, 2007.
- D40. Martin O Mendez, Davide D Ruini, Omar P Villantieri, Matteo Matteucci, Thomas Penzel, Sergio Cerutti, and Anna Maria Bianchi. "*Detection of Sleep Apnea from surface ECG based on features extracted by an Autoregressive Model*". In proceedings of 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society pp. 6105-6108, October, 2007 **Class 3 (B)**
- D39. Andrea Bonarini, and Matteo Matteucci. "*FIXCS: a Fuzzy Implementation of XCS*". In proceedings of IEEE International Fuzzy Systems Conference pp. 1-6, July, 2007. **Class 2 (A-)**
- D38. Andrea Bonarini, Wolfram Burgard, Giulio Fontana, Matteo Matteucci, Domenico Giorgio Sorrenti and Juan Domingo Tardos. "*RAWSEEDS: Robotics Advancement through Web-publishing of Sensorial and Elaborated Extensive Data Sets*". In proceedings of IROS'06 Workshop on Benchmarks in

Robotics Research On line, 2006.

- D37. Alberto Colombo, Matteo Matteucci, and Domenico G Sorrenti. "Calibration of General Non Single Viewpoint Catadioptric Sensors". Proceedings of Robocup Symposium, 2006.
- D36. Andrea Bonarini, Davide A Migliore, Matteo Matteucci, Matteo Naccari. "A revaluation of frame difference in fast and robust motion detection". In proceedings of the 4th ACM international workshop on video surveillance and sensor networks pp. 215 - 218, New York, NY, USA, 2006.
- D35. Daniele Marzorati, Matteo Matteucci, Domenico Giorgio Sorrenti. "3D-6DoF Hierarchical SLAM with 3D vision". In proceedings of Workshop on Robotic 3D Environment Cognition pp. 53-58, September, 2006.
- D34. Daniele Marzorati, Matteo Matteucci, Domenico Giorgio Sorrenti. "Multi-criteria data association in 3D-6DoF hierarchical SLAM with 3D segments". In Proceedings of 3rd International Workshop on Advances in Service Robotics, 2006.
- D33. F Archetti, Cristina E Manfredotti, Matteo Matteucci, Vincenza Messina, Domenico Giorgio Sorrenti. "Parallel First-Order Markov Chain for On-Line Anomaly Detection in Traffic Video Surveillance". In proceedings of Institution of Engineering and Technology Conference on Crime and Security pp. 582-587, June, 2006.
- D32. Davide Aliprandi, Alex Mancastropa, Matteo Matteucci. "A Bayesian Approach to Learning Classifier Systems in Uncertain Environments". In proceedings of the 8th annual conference on Genetic and Evolutionary Computation Conference (GECCO) pp. 1537 - 1544, New York, NY, USA, 2006. **Class 2 (A)**
- D31. Lorenzo Mussone, and Matteo Matteucci. "OD matrices estimation from link flows by neural networks and PCA". In proceedings of IFAC Symposium on Control in Transportation Systems 11:165-170, 2006.
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- D29. Caterina Melchiorre, Matteo Matteucci, and J Remondo. "Artificial Neural Networks and Robustness Analysis in Landslide Susceptibility Zonation". In proceedings of International Joint Conference on Neural Networks (IJCNN) pp. 4375-4381, 2006. **Class 3 (B)**
- D28. Federico Anzani, Daniele Bosisio, Matteo Matteucci, Domenico Giorgio Sorrenti. "On-Line Color Calibration in Non-Stationary Environments". In proceedings of Robocup Symposium, 2005.
- D27. Andrea Bonarini, Daniele Lavatelli, and Matteo Matteucci. "A Composite System for Real-Time Robust Whistle Recognition". In proceedings of Robocup Symposium, 2005.
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- D24. Daniele Marzorati, Matteo Matteucci, Domenico Giorgio Sorrenti. "3D-6DOF Hierarchical SLAM with Trinocular Vision". In proceedings of 2nd European Conference on Mobile RObots (ECMR) pp. 56-61, 2005.
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- D16. Nicola Gatti, Matteo Matteucci, Licia Sbattella. "*An ICT Aid for Verbal Impaired People: Bliss2003*". In proceedings of International Conference on Computers Helping People with Special Needs (ICCHP) pp. 983-990, July, 2004.
- D15. Nicola Gatti, and Matteo Matteucci. "*CABA2L a Bliss Predictive Composition Assistant for AAC Communication Software*". In Proceedings of the 6th ACM/AAAI International Conference on Enterprise Information Systems (ICEIS) 5:89-96, April, 2004.
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- D5. Riccardo Cassinis, Paolo Meriggi, Andrea Bonarini, Matteo Matteucci. "*Device communities development toolkit: an introduction*". In Proceedings of EUROBOT'01 pp. 155-161, 2001.
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E. Articles in Collections

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- E4. Antonio Bianchi, Bernardo Dal Seno, Nicola Gatti, Matteo Matteucci, and Licia Sbattella. *"Computational linguistics for learning and language impairments"*. Disabilità e ricerca avanzata al Politecnico di Milano 10:54-59, October, 2006.
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F. Articles in National Journals

- F4. Luca Iocchi, Emanuele Menegatti, Andrea Bonarini, Matteo Matteucci, Enrico Pagello, Luigia Carlucci Aiello, Daniele Nardi, Fulvio Mastrogiovanni, Antonio Sgorbissa, Renato Zaccaria, Rosario Sorbello, Antonio Chella, Marcello Giardina, Primo Zingaretti, Emanuele Frontoni, Adriano Mancini, Grazia Cicirelli, Alessandro Farinelli, Domenico G. Sorrenti. *"Development of intelligent service robots"*. Intelligenza Artificiale, 7(2):139-152, IOS Press, 2013.
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- F2. Alberto Ceriani, Lorenzo Mussone, Aldo Colombo, Paola Vigo, and Matteo Matteucci. *"Analisi Ex-Post di un campione di rotatorie per una revisione normativa (seconda parte)"*. Strade & Autostrade, 4:132-135, EDI-CEM Srl. 2012.
- F1. Lorenzo Mussone, Marco Bassani, Matteo Matteucci, Davide Rizzi. *"L'analisi delle prestazioni di una rotatoria con tecniche di analisi delle immagini"*. Strade & Autostrade 3(81):164-170, EDI-CEM Srl, 2010.

G. Technical Reports

- G10. Christophe Leroux, Roberto Labruto, Chiara Boscarato, Franco Caroleo, Jan-Philipp Günther, Severin Löffler, Florian Münch, Susanne Beck, Elisa May, Corinne Huebert-Saintot, Madeleine de Cock Buning, Lucky Belder, Roeland de Bruin, Andrea Bonarini, Matteo Matteucci, Pericle Salvini, Burkhard Schafer, Amedeo Santosuosso, Eric Hilgendorf. ["Suggestion for a green paper on legal issues in robotics"](#). Contribution to Deliverable D3.2.1 on ELS issues in robotics. 2012.
- G9. Matteo Matteucci, Davide Rizzi, and Andrea Romanoni. *"3D reconstruction of vehicular trajectory from single and multiple camera images"*. Department of Electronics and Information, Politecnico di Milano, Technical Report 2012.10, 2012.
- G8. Nicola Gatti, Matteo Matteucci. *"CABA²L a Bliss Predictive Composition Assistant for AAC Communication Software"*, Technical Report N 2003.44, Dipartimento di Elettronica e Informazione, Politecnico di Milano, 2003.
- G7. D. Danzi, G. Gatti, Nicola Gatti, Matteo Matteucci, Licia Sbattella. *"BLISS 2003: an Assistive Technology Aid for Verbal Impaired People"*, Technical Report N 2003.43, Dipartimento di Elettronica e Informazione, Politecnico di Milano, 2003.
- G6. Andrea Bonarini, Matteo Matteucci, Marcello Restelli. *"A novel model to rule behavior interaction"*, Technical Report N 2003.42, Dipartimento di Elettronica e Informazione, Politecnico di Milano, 2003.
- G5. Matteo Matteucci. *"Publish/Subscribe Middleware for Robotics: Requirements and State of the Art"*,

- Technical Report N 2003.3, Dipartimento di Elettronica e Informazione - Politecnico di Milano, 2003.
- G4. Matteo Matteucci. *“Compound techniques for quality analysis in automotive laser welding”*, Technical Report N 2002.40, Dipartimento di Elettronica e Informazione, Politecnico di Milano, 2002.
- G3. Matteo Matteucci. *“ELearNT: Evolutionary Learning of Rich Neural Network Topologies”*, Technical Report N CMU-CALD-02-103, Carnegie Mellon University, Pittsburgh PA, 2002.
- G2. Andrea Bonarini, Claudio Bonacina, Matteo Matteucci. *“A framework to support the reinforcement function design in real world, agent-based, application”*, Technical Report N 99.73, Dipartimento di Elettronica e Informazione, Politecnico di Milano, 1999.
- G1. Matteo Matteucci. *“Fuzzy Learning Classifier System: Issues and Architecture”*, Technical Report N 99.71, Dipartimento di Elettronica e Informazione, Politecnico di Milano, Milano I, 1999.

H. Accepted, Under Review, and arXiv preprints

- H19. Paolo Cudrano, Simone Mentasti, Matteo Matteucci, Mattia Bersani, Stefano Arrigoni, Federico Cheli. *“Advances in centerline estimation for autonomous lateral control”*. In IEEE Intelligent Vehicles Symposium (IV). 2020 - Accepted
- H18. Mattia Bersani, Simone Mentasti, Paolo Cudrano, Michele Vignati, Matteo Matteucci, Federico Cheli. *“Robust vehicle pose estimation from vision and INS fusion”*. In IEEE 23rd International Conference on Intelligent Transportation Systems (ITSC) . 2020 - Accepted.
- H17. Alessandro Brusafferri, Matteo Matteucci, Danial Ramin, Stefano Spinelli, Andrea Vitali. *“Probabilistic Day-Ahead Energy Price Forecast by a Mixture Density Recurrent Neural Network”*. In 7th International Conference on Control, Decision and Information Technologies (CoDIT).2020 - Accepted.
- H16. Alessandro Brusafferri, Matteo Matteucci, Stefano Spinelli, Andrea Vitali. *“Extracting Finite State Representations from Recurrent Models of Industrial Cyber Physical Systems”*. In 7th International Conference on Control, Decision and Information Technologies (CoDIT). 2020 - Accepted.
- H15. Alessandro Brusafferri, Matteo Matteucci, Pietro Portolani, Stefano Spinelli, Andrea Vitali. *“Hybrid System Identification Using a Mixture of NARX Experts with LASSO-Based Feature Selection”*. In 7th International Conference on Control, Decision and Information Technologies (CoDIT).2020 - Accepted.
- H14. Aida Brankovic, Matteo Matteucci, Marcello Restelli, Luca Ferrarini, Luigi Piroddi, Andrea Spelta, and Fabrizio Zausa. *“A data-based approach for the prediction of stuck-pipe events in oil drilling operations”*. Abu Dhabi International Petroleum Exhibition & Conference (ADIPEC). Abu Dhabi. 2020 - Accepted
- H13. Francesco Pinto, Andrea Romanoni, Philip Torr, Matteo Matteucci. *“SECI-GAN: Semantic and Edge Conditioned Inpainting for dynamic object removal”*. In British Machine Vision Conference. 2020 - Under review.
- H12. Eugenio Lomurno, Andrea Romanoni, Matteo Matteucci. *“Improving Multi-View Stereo Completeness via Super-Resolution”*. In 25th Intl. Conference on Pattern Recognition (ICPR). 2020 - Under Review
- H11. Chiara Plizzari, Marco Cannici, Matteo Matteucci. *“Spatial Temporal Transformer Network for Skeleton-Based Action Recognition”*. European Conference on Computer Vision (ECCV). 2020 - Under review.
- H10. Marco Cannici, Marco Ciccone, Andrea Romanoni, Matteo Matteucci. *“A Differentiable Recurrent Surface for Asynchronous Event-Based Data”*. European Conference on Computer Vision (ECCV). 2020 - Under review.
- H9. Linda Greta Dui, Francesca Lunardini, Cristiano Termine, Matteo Matteucci, Simona Ferrante. *“A Tablet-Based App to Discriminate Children at Potential Risk of Handwriting Alterations in a Preliteracy Stage”*. In 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC). 2020 - Accepted
- H8. Linda Greta Dui, Francesca Lunardini, Cristiano Termine, Matteo Matteucci, Natale Adolfo Stucchi, Nunzio Alberto Borghese, Simona Ferrante. *“A Tablet App to Anticipate Handwriting Skills Screening at Preliteracy: Instrument Validation Study”*. JMIR Serious Games. 2020 - Under Review

- H7. Luca Cavalli, Gianpaolo Di Pietro, Matteo Matteucci. "*Learning Affordance Prediction via Task-Oriented Grasp Quality Metrics*". Frontiers Neurorobotics. 2020 - Under review.
- H6. Mattia Bersani, Simone Mentasti, Pragyan Dahal, Stefano Arrigoni, Michele Vignati, Federico Cheli, Matteo Matteucci. "*An integrated algorithm for ego-vehicle and obstacles state estimation for autonomous driving*". Robotics and Autonomous Systems. 2020 - Under review.
- H5. Hafeez Husain Cholakkal, Simone Mentasti, Mattia Bersani, Stefano Arrigoni, Matteo Matteucci, Federico Cheli. "*LiDAR - stereo camera fusion for accurate depth estimation*". In AEIT International Conference of Electrical and Electronic Technologies for Automotive (AUTOMOTIVE). 2020 - Under Review
- H4. Simone Mentasti, Mattia Bersani, Matteo Matteucci, Federico Cheli. "*Multi-state end-to-end learning for autonomous vehicle lateral control*". In AEIT International Conference of Electrical and Electronic Technologies for Automotive (AUTOMOTIVE). 2020 - Under Review.
- H3. Luca Bascetta, Marcello Farina, Alessandro Gabrielli, Matteo Matteucci. "*A feedback linearisation algorithm for single-track models with structural stability properties*". arXiv preprint arXiv:2003.13793
- H2. Luca Cavalli, Gianpaolo Di Pietro, Matteo Matteucci. "*Towards Affordance Prediction with Vision via Task Oriented Grasp Quality Metrics*". arXiv preprint arXiv:1907.04761. 2019
- H1. Francesco Lattari, Marco Ciccone, Jonathan Masci, Francesco Visin. "*ReConvNet: Video Object Segmentation with Spatio-Temporal Features Modulation*" arXiv preprint arXiv:1806.05510. 2018

Autorizzo il trattamento dei miei dati personali presenti nel cv ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali" e del GDPR (Regolamento UE 2016/679).

Date: 20/06/2020

In compliance with the Italian legislative Decree no. 196 "Codice in materia di protezione dei dati personali" dated 30/06/2003, and the GDPR (EU 2016/679). I hereby authorize you to use and process my personal details contained in this document."

Date: 20/06/2020

CV SUMMARY - MATTEO MATTEUCCI

This document is a *Summary* of Matteo Matteucci Curriculum Vitae and Studiorum (CV) for applications which require a shorter resume; it complements the CV with a selection by the applicant of the information provided by the full CV for a fast access and consultation, but it does not replace the full CV version for a more complete view of Matteo Matteucci teaching, research and professional activities. In addition, with respect to the CV, a detailed report of Matteo Matteucci funding track is reported.

DATE OF BIRTH 23/04/1974

EDUCATION

2003 **PhD Degree** in Computer Engineering and Automation, Politecnico di Milano, Milan
 2002 **Master of Science Degree (MS)** in Knowledge Discovery and Data Mining, Center for Automatic Learning & Discovery, Carnegie Mellon University, Pittsburgh (PA - USA)
 1999 **Master of Science Degree (Laurea)** in Computer Engineering, Politecnico di Milano, Milan
 (Final Grade 100/100 *cum Laude*)

CAREER

2015 – Present **Associate Professor**, Politecnico di Milano, Milan
 2008 – 2015 **Assistant Professor**, Politecnico di Milano, Milan
 2003 – 2015 **Post-Doc Researcher** (Assegnista di Ricerca), Politecnico di Milano, Milan
 2001 – 2002 **Visiting Student**, Carnegie Mellon University, Pittsburgh (PA), for 1 year
 2000 – 2003 **Ph.D. Student**, Politecnico di Milano, Milan

PARENTAL/ILLNESS LEAVE PERIODS

None

HABILITATION

Type of habilitation	Country	SSD (if Italian habilitation) or topic area	Date of achievement
Full Professor	Italy	ING-INF/05 (09/H1)	04/04/2017
Associate Professor	Italy	INF-01 (01/B1)	29/01/2014
Associate Professor	Italy	ING-INF/05 (09/H1)	03/12/2013

RESEARCH INTERESTS

- **Robotics:** Robot Benchmarking, Simultaneous Localization and Mapping (SLAM), Computer Vision, Sensor Fusion
- **Artificial Intelligence:** Artificial Neural Networks, Deep Learning, Applied Machine Learning

LEADERSHIP IN COMPETITIVE RESEARCH PROJECTS

Project Acronym	Time Period	Funding Institution	Funding Scheme	Role of the applicant	Budget for applicant's institution	Budget managed by applicant
LoViCoSpec	2020	EIT Manufacturing	EIT	Principal Investigator	€ 75.645	€ 75.645
METRICS	2020-2022	European Commission	H2020	Principal Investigator	€ 166.865	€ 166.865
DEEPFIELD	2019-2022	European	H2020	Principal	€ 129.250	€ 129.250

		Commission		Investigator		
L4MS	2017-2021	European Commission	H2020	Task Leader	€ 423.750	€ 85.625*
BEAST	2019-2020	European Commission	H2020 (Cascade funding)	Principal Investigator	€ 48.750	€ 48.750
MADROB	2019-2020	European Commission	H2020 (Cascade funding)	Principal Investigator	€ 48.750	€ 48.750
MATTCH	2019-2020	European Space Agency	ESA	Principal Investigator	€ 50.500	€ 50.500
Sciroc	2018-2021	European Commission	H2020	Principal Investigator	€ 58.750	€ 58.750
Plug & Bench	2018-2019	European Commission	H2020 (Cascade funding)	Principal Investigator	€ 129.375	€ 129.375
TEINVEIN	2018-2019	Regione Lombardia	FESR	Task Leader	€1.026.468	€ 77.825*
Drone112	2018	EIT Digital	EIT	Principal Investigator	€ 58.500	€ 58.500
RockEU2	2016-2018	European Commission	FP7	Principal Investigator	€ 133.000	€ 133.000
Grape	2016-2018	European Commission	FP7 (Cascade funding)	Task Leader	€ 134.400	€ 65.000*
Clud4Drones	2017	EIT Digital	EIT	Principal Investigator	€ 92.700	€ 92.700
RoCKIn	2013-2015	European Commission	FP7	Principal Investigator	€ 228.980	€ 228.980
ALMA	2013-2015	European Commission	AAL Joint Program	Principal Investigator	€ 284.390	€ 284.390
SHELL	2014-2015	Regione Lombardia	FESR	Task Leader	€ 869.600	€ 68.400*
SINOPIAE	2012-2014	Regione Lombardia / MIUR	Progetti Cluster	Task Leader	€ 119.000	€ 35.000*
ROAMFREE	2011-2013	MIUR	PRIN	Project Coordinator	€ 94.215	€ 94.215
RAWSEEDS	2006-2009	European Commission	FP6	Project Coordinator	€ 192.980	€ 192.980
BCI-EA	2006-2009	Regione Lombardia / POLIMI	Grant "Avvio alla ricerca"	Principal Investigator	€ 30.000	€ 30.000
					TOTAL	€2.154.500

*The budget handled by the applicant refers to the applicant unit activities only.

LEADERSHIP IN INDUSTRIAL RESEARCH PROJECTS

Project Acronym	Time Period	Funding Company	Role of the applicant	Budget for the applicant's institution	Budget handled by the applicant
Tracetoo	2020	Tracetoo S.r.l.	Principal Investigator	€ 18.000	€ 18.000
Tecnomare Localizzazione	2019-2020	ENI SpA	Co-Principal Investigator	€ 72.230	€ 42.615*
EB-MIMO	2019-2020	Huawei	Co-Principal Investigator	€ 200.000	€ 65.000*
MOXOFF	2019	Moxoff SpA	Co-Principal Investigator	€ 15.000	€ 5.000*
AGS Train	2019	AGS	Co-Principal Investigator	€ 21.800	€ 10.900*

SDL-ABB	2018-2019	ABB SpA	Principal Investigator	€ 65.000	€ 65.000
Tecnomare DJI Guidance	2018-2019	ENI SpA	Principal Investigator	€ 20.000	€ 20.000
Tecnomare ROS	2018	ENI SpA	Principal Investigator	€ 12.000	€ 12.000
Tecnomare Drone	2017-2018	ENI SpA	Workpackage Leader	€ 32.100	€ 16.050*
ENI-NPT	2017-2018	ENI SpA	Task Leader	€ 230.000	€ 53.375*
ASTER	2017-2018	Elettronica ASTER	Principal Investigator	€ 130.000	€ 130.000
Niguarda	2013-2018	ARCA - Regione Lombardia	Principal Investigator	€ 57.600	€ 57.600
COMAU	2016	COMAU SpA	Co-Principal Investigator	€ 20.000	€ 10.000*
STELE	2015-2016	Infosolution SpA	Principal Investigator	€ 22.000	€ 22.000
Gaiotto	2012-2013	Gaiotto Automation SpA	Principal Investigator	€ 10.300	€ 10.300
Progetto ON	2010-2013	Infosolution SpA	Principal Investigator	€ 70.000	€ 70.000
				TOTAL	€ 607.840

*The reported budget refers to the task/workpackags activities only.

SCIENTIFIC PRODUCTION AND METRICS

- **Scientific Productivity:** 256 publications (184 entries on Scopus, 256 co-authors according to Scopus, no single-author papers):
 - Author/Co-author of 24 top-ranked Q1 journal papers (including **IEEE Transactions on Systems, Man, and Cybernetics - Part B; International Journal of Approximate Reasoning, IEEE Transactions on Dependable and Secure Computing, ACM Transactions on Computer-Human Interaction, Pattern Recognition Letters, Bioinformatics, IEEE Robotics and Automation Magazine, IEEE Transactions on Knowledge and Data Engineering, Remote Sensing, Briefings in Bioinformatics, BMC Bioinformatics, Information Sciences, Robotics and Autonomous Systems, Methods of Information in Medicine, Geomorphology, Information Fusion, Computational Intelligence and Neuroscience, Clinical Neurophysiology, Journal of Advanced Transportation, Journal of Neural Engineering, Control Engineering Practice, PloS ONE, Applied Energy**)
 - Author/Co-author of 161 scientific publications on peer-reviewed conferences including 7 top-level A++/A+ conferences (including: **International Conference on computer Vision (ICCV), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)**)
 - Inventor/Co-inventor of 8 patent applications (3 Italian + 1 European + 3 EU extensions + 1 US extension) with, among others, Centro Ricerche FIAT, Politecnico di Torino, Infosolution SpA, Università degli Studi Milano-Bicocca, ABB SpA (**2 Italian patents and 2 EU Extensions out of 8 patent applications already granted**)
- **Publication Impact:** Based on Google Scholar: h-index 34 citations 4778
Based on Scopus: h-index 24 (23 w/o self citations) citations 2298

AWARDS AND RECOGNITIONS (SELECTION OF PAST 10-YEARS)

- 2019 **Best Paper Award** for the paper “Asynchronous Convolutional Networks for Object Detection in Neuromorphic Cameras” at Second International Workshop on Event-based Vision and Smart Cameras in conjunction with IEEE CVPR 2019
- 2018 Awarded with a 20K\$ **Microsoft Azure sponsorship grant** as a support for the PhD Course on “Deep Learning: Theory Techniques and Applications”
- 2017 Awarded with a 20K\$ **Microsoft Azure sponsorship grant** for the experimentation on “Deep Learning machine on the cloud”
- 2016 **Best Paper Award** for the paper “ReSeg: A Recurrent Neural Network-based Model for Semantic

- Segmentation” at DeepVision 2016, International Workshop on Deep Learning in Computer Vision in conjunction with IEEE CVPR 2016
- 2016 **Best Paper Award** for the paper “Automatic 3D Reconstruction of Manifold Meshes via Delaunay Triangulation and Mesh Sweeping” at 2016 IEEE Winter Conference on Applications of Computer Vision
- 2015 Awarded by NVIDIA with a Titan X GPU within the **Academic Hardware Grant**
- 2014 Awarded, with Dott. Martino Migliavacca and Prof. Andrea Bonarini, of “The Business Grant and The Acceleration Program” with the project R2P in the **Working Capital Accelerator Program (WCAP 2014)** by Telecom Italia
- 2011 Winner, with the Industrial Partner Infosolution SpA, of “**Premio Antonio D’Auria 2010** per progetti e prototipi di dispositivi meccatronici innovativi di ausilio a disabili motori” from Società Italiana di Robotica e Automazione
- 2011 Winner, with the Industrial Partner Infosolution SpA, of the Intesa San Paolo “**Startup Initiative**” and the Italian round of the “Global Social Venture Competition” with the RobyWheelChair project

INVITED TALKS AND SEMINARS (SELECTION OF PAST 10-YEARS)

Academic context

- 13/12/2019 Invited talk “*Robotics and Farming: Technologies & Innovations for an Agriculture 4.0*” at the 2nd Annual Automation & Robotics for Non-Road Applications, Gothia Towers, Gothenburg
- 20/09/2019 Invited talk “*Intelligent robots are at the door ... but can they open it?*” at the Sciroc-AI4EU joint Workshop on Evaluation and Benchmarking of Human-Centered AI Systems, Milton Keynes
- 21/07/2017 Invited talk “*The RAWSEEDS Project: How we did it!*” at the CHIST-ERA Conference on “Object recognition and manipulation by robots: Data sharing and experiment reproducibility”, Krakov
- 28/09/2015 Invited talk “*Do we really need to replicate experiments?*” in the “Open forum on evaluation of replication of experiments and benchmarking in robotics research” at the 2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2015), Hamburg
- 15/09/2015 Invited lecture on “*The RAWSEEDS Project: How we did it!*” at the 2015 IEEE-RAS Summer School on Experimental Methodology, Performance Evaluation and Benchmarking in Robotics, Benicassim
- 15/09/2015 Invited lecture on “*Benchmarking and Competitions*” at the 2015 IEEE-RAS Summer School on Experimental Methodology, Performance Evaluation and Benchmarking in Robotics, Benicassim
- 04/06/2014 Invited talk “RoCKIn: Driving Robotics Forward through Collaboration, Benchmarking and Competition” in the Forum on “Robotics Challenges and Competitions” at the 2014 IEEE International Conference on Robotics and Automation (ICRA 2014), Hong Kong
- 12/04/2014 Invited talk titled “Benchmarking in Robotics: Challenges and Visions” in the Workshop “Shared infrastructures, benchmarking and performance evaluation” at the 2014 European Robotics Forum (ERF), Rovereto
- 23/01/2014 Invited talk “Benchmarking through competitions” to the EuRoC Challenge Design Workshop, Munich
- 26/01/2012 Invited seminar “Integrating P300 and Error Potentials in a Single BCI: Algorithms, Techniques & Performance Assessment” in the seminar program “Bioengineering Seminar Series” at the Department of Bioengineering of Politecnico di Milano, Milan

Industrial context

- 18/11/2019 Invited talk “*AI applied to 5G: Learning Methods for Channel Estimation*” at the Huawei Workshop on High Frequency Technologies for 5G, Politecnico di Milano, Milan
- 15/10/2019 Invited talk “*Dai Big Data ai Sistemi di Autoapprendimento*” hosted by Fondazione Faraggiana, Novara
- 04/02/2019 Invited talk “*Intelligenza artificiale: ambiti applicativi e impatto sui sistemi industriali*” hosted by APITech as part of the event “Intelligenza Artificiale e Sistemi Industriali: Applicazioni nel contesto Impresa 4.0”, Lecco
- 18/09/2018 Invited talk “*Cosa intendiamo per IA ... tutto ciò che avreste voluto sapere e non avete mai osato chiedere.*” at Convegno “Intelligenza Artificiale e Ricerca Clinica”, Milan
- 05/07/2018 Invited talk “*A che punto siamo con le tecnologie dell’AI e il loro futuro possibile*” at Convegno “AI Tech Conference: Artificial Intelligence per le imprese e per un mondo migliore”, Milan
- 30/11/2017 Invited talk “*Sul senso (comune) dei Big Data*” at Convegno “Big Data e Robotica nella fabbrica digitale”, Milan
- 29/04/2017 Invited talk “*AI and Cognitive Technology: Why, What, How ...*” at the Cognitech Conference, Milan

21/04/2016 Invited talk "Modular development of service robots: from Rapid Robot Prototyping to Nova Core" in the Sessione Specialistica "Robot & Co." at A&T 2016, Torino
 18/04/2016 Invited talk "Do Big Data make (common) sense?" at Convegno "L'automazione nell'era dei Big Data: scenari e prospettive", at MEC SPE, Parma

TEACHING EXPERIENCE (SELECTION OF PAST 5-YEARS)³

Institution name	Course name	Credits or Hours	No. of students	Reference Study Course	Time period	Students Eval. ⁴
POLIMI UNIMI	Machine Learning	6 CFU	27	Bioinformatics for Computational Genomics	2019/2020	--
POLIMI	Artificial Neural Networks and Deep Learning	5 CFU	256	Computer Science Engineering	2019/2020	--
POLIMI (Polo di Como)	Machine Learning	5 CFU	13	Computer Science Engineering	2018/2019	3.9/4.0
POLIMI	Robotics	5 CFU	214	Computer Science Engineering	2018/2019	3.2/4.0
POLIMI (Poli di Como)	Cognitive Robotics	5 CFU	14	Computer Science Engineering	2018/2019	3.0/4.0
POLIMI (Polo di Como)	Machine Learning	5 CFU	43	Computer Science Engineering	2017/2018	3.5/4.0
POLIMI	Robotics	5 CFU	93	Computer Science Engineering	2017/2018	3.1/4.0
POLIMI (Polo di Como)	Cognitive Robotics	5 CFU	14	Computer Science Engineering	2016/2017	--
POLIMI (Polo di Como)	Machine Learning	5 CFU	58	Computer Science Engineering	2016/2017	High
POLIMI	Robotics	5 CFU	133	Computer Science Engineering	2016/2017	Medium
POLIMI (Polo di Como)	Cognitive Robotics	5 CFU	44	Computer Science Engineering	2016/2017	High
POLIMI	Robotics	5 CFU	119	Computer Science Engineering	2015/2016	High
POLIMI (Polo di Como)	Data Analysis and Retrieval	10 CFU	66	Computer Science Engineering	2015/2016	High
POLIMI	Advances in Deep Learning with Applications in Text and Image Processing	3/5 CFU*	72	PhD School	2018/2019	--
POLIMI	Integration and Computation Analysis of Genomic Information	1/5 CFU*	5	PhD School	2017/2018	--
POLIMI	Deep Learning: Theory, Techniques and Applications	3/5 CFU*	116	PhD School	2017/2018	--
POLIMI	Soft Computing: Theory, Techniques, and Applications	2/5 CFU*	31	PhD School	2016/2017	--
POLIMI	Biosignal Processing 4 All: Affective Computing, Biometrics Neuromarketing	1/5 CFU*	19	PhD School	2016/2017	--
POLIMI	Big Data Technologies	1/5	24	PhD School	2016/2017	--

³ Courses reported here have been selected as those for which I have been responsible or co-responsible for. A complete report of teaching experience can be found in my complete Curriculum Vitae.

⁴ Institution mean and percentiles for the years 2018/2019 and 2017/2018 are: Mean = 3.1, 75% = 3.6, 25% = 2.6.

		CFU*				
CEFRIEL	Statistical Machine Learning	24 h	22	Master in Alto Apprendistato	2019	--
CEFRIEL	Advanced Machine Learning	32 h	20	Master in Alto Apprendistato	2018	--
CEFRIEL [Nokia]	Machine Learning	14 h	15	Company Training	2020	
CEFRIEL [Nokia]	Machine Learning for Big Data	12 h	15	Company Training	2020	
POLIMI [AGS]	Deep learning per l'analisi di immagini	24 h	12	Company Training	2019	--
CEFRIEL [Nokia]	Artificial Intelligence and Machine Learning	36 h	15	Company Training	2019	--
MIP [COFIDIS]	Machine Learning	8 h	18	Company Training	2019	4.6/5.0
CEFRIEL [Edison]	Artificial Intelligence	24 h	20	Company Training	2018	--
CEFRIEL [Bosch]	Data Mining and Machine Learning	16 h	24	Company Training	2018	--

*The reported credits refer to the part of the course taught by the applicant over the total number of credits.

INSTITUTIONAL RESPONSIBILITIES (SELECTION OF PAST 10-YEARS)

- 2019 - present **Member** of Technical Board on “Robust and Efficient mmWave Communication” in the Joint Research Center (JRC) between Huawei and Politecnico di Milano
- 2018 - present **Scientific Director** of the “Master di I livello in Artificial Intelligence and Machine Learning” offered by Politecnico di Milano in conjunction with CEFRIEL
- 2018 - present Member of the **Faculty Board** of the “Data Analytics and Decision Sciences” PhD Program at Politecnico di Milano
- 2016 - present **Segretario Consiglio Corso di Studi** in Computer Science and Engineering of Politecnico di Milano
- 2015 - present **Member** of “REPRISE: Register of Expert Peer Reviewers for Italian Scientific Evaluation” for Ministero dell’Istruzione dell’Università e della Ricerca
- 2015 - present **Coordinator** (and co-founder in 2014) of the Interaction between Driver, Road Infrastructure, Vehicle, and Environment (I.DRIVE) interdepartmental laboratory of Politecnico di Milano (<http://idrive.polimi.it>)
- 2013 - present **Member** (and co-founder in 2012) of the Assistive Technology Group of Politecnico di Milano - Polo Regionale di Como (<http://atg.deib.polimi.it/>)
- 2009 - present **Member** of “Commissione Orari” for the Computer Engineering track of Politecnico di Milano - Polo Regionale di Como
- 2008 - present **Delegato SAT** (Struttura Accademica dei Tirocini) for the Computer Engineering track at Politecnico di Milano - Campus Leonardo

SUPERVISION OF MASTER, DOCTORAL STUDENTS AND POSTDOCTORAL RESEARCHERS

- 2003 – present **Advisor/Co-advisor** of **25** Doctoral Students at Politecnico di Milano, **2** Doctoral Students at Università degli Studi di Milano-Bicocca, and **1** Doctoral Student at Politecnico di Torino
- 2014 – present **Opponent Member** of **9** Doctoral Examination Committees at Politecnico di Milano, Politecnico di Torino, Università degli Studi di Roma “La Sapienza”, Università della Svizzera Italiana, Università della Calabria
- 2010 – present **Advisor/Co-advisor** of **100+** Master Students in Computer Engineering, Politecnico di Milano, Milan

ORGANIZATION OF SCIENTIFIC MEETINGS (SELECTION OF PAST 10-YEARS)

- 2020 **Local Chair** for the 25th International Conference on Pattern Recognition (ICPR 2020), Milan, Italy, January 2021
- 2018 **Co-Chair** of ERF 2018 Workshop on “Research Reproducibility in Robotics” (part of the Competitions and Benchmarking session) co-organized with Fabio Bonsignorio, Tampere, Finland, 12th March 2018
- 2017 **Co-Chair** of ERF 2017 Workshop on “Robotics Competitions and Challenges” Co-organized with Agostino De Santis, Edinburgh, Scotland, 24th March 2017

2012 **Co-Chair** of IROS 2012 Workshop on “Progress, Challenges and Future Perspectives in Navigation and Manipulation Assistance for Robotic Wheelchairs”, Vilamoura, Algarve, Portugal, October 7th to 12th, 2012.

COMMISSIONS OF TRUST (SELECTION OF PAST 10-YEARS)

2017 - present IEEE RAS Standards Development **Working Group** “3D-MDR - Robot 3D Map Data Representation”
2014 - present IFAC **Technical Committee** “7.5. Transportation and Vehicle Systems - Intelligent Autonomous Vehicles”
2007 - present **Program Committee** of 20+ International Conferences and Workshops
2020 **Senior Program Committee Member** of the European Conference on Artificial Intelligence
2019 **Member of Evaluation Committee** for a 09/H1 (ING-INF/05) “Professore II fascia” position at Università degli studi di Roma “La Sapienza”
2018 **Associate Editor** for the Special Session on “Research Reproducibility and Benchmarking of Intelligent Robots” of 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2018).
2017 **Associate Editor** of 2017 IEEE International Conference on Robotics and Automation (ICRA 2017).
2017 **Member of Evaluation Committee** for the 09/H1 (ING-INF/05) RTDa position funded by “Progetto H2020 INTCATCH”, Dipartimento di Informatica, Università degli Studi di Verona
2015 - 2016 IEEE RAS **Standardization Committee** for the “1873-2015 - IEEE Standard for Robot Map Data Representation for Navigation”
2014 **Project Reviewer and rapporteur** for the SIR 2014 (Scientific Independence of young Researchers) funding program by the Italian Ministry of University and Research (MIUR)
2011 **Project Reviewer** for the PRIN 2010-2011 (Programmi di Ricerca Scientifica di Rilevante Interesse Nazionale) funding program by the Italian Ministry of University and Research (MIUR)

SPIN-OFF

- **Nova Labs S.r.l.:** founded in November 2015 by Martino Migliavacca (CEO), Davide Rizzi (CTO), Andrea Bonarini, Matteo Matteucci, and Industrio Venture. Registered as Politecnico di Milano spin-off. Year 2019 income € 746.000.

EVIDENCE OF TECHNICAL ACCOMPLISHMENT

- **RAWSEEDS Benchmarking Toolkit:** from 2006 to 2009 I coordinated the FP6FP6-045144 European project RAWSEEDS (www.rawseeds.org) out of which the first European Benchmarking Toolkit for Simultaneous Localization and Mapping was developed. It consists of 11 multi-sensor datasets (~600GB), validated ground truth, and evaluation metrics. The project and its results have been recognized as the first European effort in Autonomous Robot benchmarking and evaluation. The RAWSEEDS benchmarking toolkit is still downloaded, used, and referenced in scientific publications after the end of the project in 2009; the project website has been visited by 28,325 new users since May 2009 (after the end of the project) for a total of 200.000+ pageviews.
- **Rapid Robot Prototyping (Nova Core):** HW/SW framework for the development of robots, started in 2013, as part of the PhD thesis of Martino Migliavacca, it has been awarded by Telecom Italia with “The Business Grant and The Acceleration Program” in the Working Capital Accelerator Program (WCAP 2014). Later, under the name of Nova Core, Rapid Robot Prototyping has become the technological asset of Politecnico di Milano spin-off Nova Labs S.r.l. to develop products such as the COMAU robot E.Do (<https://www.comau.com/en/our-competences/robotics/edo>).
- **Unmanned vehicles for the Italian Ministero della Difesa:** Between 2010 and 2013 I participated to the QUADRIVIO project (Scientific directors Prof. Gianantnio Magnani and Prof. Luca Bascetta) for the development of an autonomous system composed of an Unmanned Ground Vehicle (UGV) and an Unmanned Aerial Vehicle (UAV) for search and rescue operations. I have been responsible for the development of the UGV autonomous navigation software system. The vehicle has been successfully demonstrated by Aero Sekur under the name UxV to the officers of the Ministero della Difesa (<http://www.cybernaua.it/rubriche/rubricadett.php?idnews=3993>). Based on the success of the UxV demonstration, between 2017 and 2018 I have been the Principal Investigator in the research project which has led to the development of the IDRA UGV (<http://www.elaster.it/default.php?idm=57&idp=64>) with Elettronica ASTER SPA. This time I have been responsible for the development of the entire unmanned vehicle autonomous navigation software. The outcome of the project, i.e., an electrical autonomous vehicle for CBRN defence, has been demonstrated successfully in front of the officers of the Ministero della Difesa (TERRARM).

- **Bed Mover:** Between 2013 and 2018 I have worked on the development of an autonomous hospital bed mover as part of the Regione Lombardia Pre-Commercial Procurement call by the Azienda Regionale Centrale Acquisti (ARCA SpA) in Associazione Temporanea di Scopo (ATS) with Università degli Studi di Milano-Bicocca and Infosolution SpA. The project has led to the application for and Italian patent with European and US extensions to protect the idea under the commercial product “BeN - Bed Navigator” commercialized by Infosolution SpA under the brand Kedos M.I.T (https://www.kedos-mit.com/images/brochure/KMIT_BeN_Bed_Navigator_ITA_19_V02-min.pdf).
- **LURCH Autonomous Wheelchair:** In 2007 I started the LURCH project for the development of an autonomous wheelchair, which could help people unable to move autonomously. This effort has resulted in an autonomous wheelchair, which sports the “shared autonomy” design paradigm: depending on the needs of the user, the robot supplies the needed autonomy from simple safety enhancer up to fully autonomous vehicle. The project has reached the maturity of an industrial prototype and this has been recognized by the two prizes (**Antonio D’Auria SIRI Prize** and Intesa **San Paolo “Startup Initiative” award**) obtained under the commercial name of RobyWheelChair. The competences built during the development of LURCH prototype have been the base for the project “ALMA: Aging without Losing Mobility and Autonomy” which led to the deployment of an autonomous wheelchair at Casa Anziani Giardino in Chiasso. The LURCH prototype has been demonstrated in public events such as Robotica Fair, and MeetMeTonight, and it has been shown on the national tv (<http://it.youtube.com/watch?v=IRP-ae4iaZA>).
- **P300 Brain-Computer Interface:** While developing the autonomous wheelchair LURCH, lot of effort has been directed to the development of effective human robot interfaces, the most challenging one being an Event Related Brain-Computer Interface. From 2007 to 2009 I developed with my PhD student Bernardo Dal Seno an interface able to capture the user intent from brain activity so to transfer this intent to the autonomous wheelchair or to enable people suffering severe pathologies (e.g., Amyotrophic Lateral Sclerosis) to communicate. In the winter of 2009 this BCI was used to control the autonomous wheelchair and this had quite resonance on the press (<http://airwiki.elet.polimi.it/index.php/MediaCoverage>). After that the lab prototype has been tested with some Amyotrophic Lateral Sclerosis patients within the two projects ON and STELE funded by FILAS SpA.

FIFTEEN MOST RELEVANT PUBLICATIONS⁵

1. Andrea Romanoni, Matteo Matteucci. “Mesh-based camera pairs selection and occlusion-aware masking for mesh refinement”. Pattern Recognition Letters, vol. 125, pp. 364-372. Elsevier. 2019. [doi:10.1016/j.patrec.2019.05.006](https://doi.org/10.1016/j.patrec.2019.05.006) **SJR: Q1**
I supervised the Post-Doc who did the actual implementation of the method, I discussed with him and suggested improvements on the technique, I supervised and revised the writing of the paper as well as the rebuttal process.
2. Vahid Jalili, Matteo Matteucci, Jeremy Goecks, Yashar Deldjoo, Stefano Ceri. “Next Generation Indexing for Genomic Intervals”. IEEE Transactions on Knowledge and Data Engineering, vol. 30, issue 10,p p. 2008-2021, IEEE. 2018. [doi:10.1109/TKDE.2018.2871031](https://doi.org/10.1109/TKDE.2018.2871031) **SJR: Q1**
I supervised the two PhD students who did the work, I contributed to the definition of the original idea and data structure, I co-supervised the writing and co-reviewed the paper as well as the rebuttal process. Data structure is called Di4 (One-dimensional Intervals Incremental Inverted Index) and it is an improvement of Di3 adding a novel incremental encoding and adaptive indexes for gene expression.
3. Vahid Jalili, Matteo Matteucci, Marco Masseroli, Stefano Ceri. “Indexing Next-Generation Sequencing data”. Information Sciences, vol. 384, pp. 90-109, Elsevier, 2017. [doi:10.1016/j.ins.2016.08.085](https://doi.org/10.1016/j.ins.2016.08.085) **SJR: Q1**
I supervised the PhD student doing the work, I contributed to the definition of the original idea and data structure, co-supervised the writing and co-reviewed the paper as well as the rebuttal process. The data structure is called Di3 (1D Interval Inverted Index).
4. Vahid Jalili, Matteo Matteucci, Marco J. Morelli, Marco Masseroli. “MuSERA: Multiple sample enriched region

⁵ For journal paper the SJR (Scimago Journal & Country Rank <https://www.scimagojr.com/>) quartiles for the year of publication of the paper, or the year before if not yet available, is reported. When the journal has multiple subjects the quartile of the subject appropriate for the paper topic is reported. For conference papers the class from the GII-GRIN-SCIE Rating (<http://valutazione.unibas.it/gii-grin-scie-rating/ratingSearch.jsf>) for the venue of the paper is reported.

assessment". Briefings in Bioinformatics, vol.18, issue 3, pp. 367-381, Oxford Academics, 2017. [doi:10.1093/bib/bbw029](https://doi.org/10.1093/bib/bbw029) **SJR: Q1**

I co-supervised the PhD student doing the work, I contributed to the definition of the idea, I co-supervised the writing and co-reviewed the paper as well as the rebuttal process.

5. Jalili Vahid, Matteo Matteucci, Marco Masseroli, Marco J. Morelli. "Using combined evidence from replicates to evaluate ChIP-seq peaks". Bioinformatics, vol. 31, issue 17, pp. 2761-2769, Oxford Academics, 2015. [doi:10.1093/bioinformatics/btv293](https://doi.org/10.1093/bioinformatics/btv293) **SJR: Q1**

I co-supervised the PhD student doing the work, I contributed to the definition of the idea, I co-supervised the writing and co-reviewed the paper as well as the rebuttal process.

6. Francesco Amigoni, Emanuele Bastianelli, Jakob Berghofer, Andrea Bonarini, Giulio Fontana, Nico Hochgeschwender, Luca Iocchi, Gerhard K. Kraetzschmar, Pedro Lima, Matteo Matteucci, Pedro Miraldo, Daniele Nardi, Viola Schiaffonati. "Competitions for Benchmarking. Task and Functionality Scoring Complete Performance Assessment". IEEE Robotics and Automation Magazine, vol. 22, issue 3, pp. 53-61, IEEE, 2015. [doi:10.1109/MRA.2015.2448871](https://doi.org/10.1109/MRA.2015.2448871) **SJR: Q1**

I co-developed the proposed framework and co-invented the original idea (with co-authors Amigoni, Bonarini, Fontana, and Schiaffonati), I collaborated to the writing and reviewing of the paper as well as the rebuttal process. Names are in alphabetical order.

7. Andrea Bonarini, Matteo Matteucci, Martino Migliavacca, Davide Rizzi. "R2P: An open source hardware and software modular approach to robot prototyping". Robotics and Autonomous Systems, vol. 62, issue 7, pp. 1073-1084, Elsevier, 2014. [doi: 10.1016/j.robot.2013.08.009](https://doi.org/10.1016/j.robot.2013.08.009) **SJR: Q1**

I co-developed the proposed framework, I co-supervised the Bachelor (D. Rizzi) and PhD (M. Migliavacca) students designing, implementing, and evaluating the system, I participated in the writing and reviewing of the paper as well as to the rebuttal process. Names are in alphabetical order.

8. Tiziano D'Albis, Rossella Blatt, Roberto Tedesco, Licia Sbattella, Matteo Matteucci. "A predictive speller controlled by a brain-computer interface based on motor imagery". ACM Transactions on Computer-Human Interaction, vol. 19, issue 3, pp. 1-25, ACM New York, 2012. [doi:10.1145/2362364.2362368](https://doi.org/10.1145/2362364.2362368) **SJR: Q1**

I coordinated the whole research work this paper originated from, I co-supervised the Master (T. D'Albis) and PhD (R. Blatt) students developing and evaluating the system, I participated to the writing and reviewing of the paper as well as to the rebuttal process.

9. Federico Maggi, Matteo Matteucci, Stefano Zanero. "Detecting Intrusions through System Call Sequence and Argument Analysis". IEEE Transactions on Dependable and Secure Computing, vol. 7, issue 4, pp. :381-395, IEEE, 2010. [doi:10.1109/TDSC.2008.69](https://doi.org/10.1109/TDSC.2008.69) **SJR: Q1**

I co-supervised the PhD Student developing and evaluating the proposed framework and participated in the development of the original idea, I collaborated to the writing and reviewing of the paper as well as during the rebuttal process.

10. Federico Maggi, Matteo Matteucci and Stefano Zanero. "Reducing false positives in anomaly detectors through fuzzy alert aggregation". Information Fusion, vol. 10, issue 4, pp. 300-311, Elsevier, 2009. [doi:j.inffus.2009.01.004](https://doi.org/10.1016/j.inffus.2009.01.004) **SJR: Q1**

I co-supervised the PhD Student developing and evaluating the proposed framework, I collaborated to the writing and reviewing of the paper as well as the rebuttal process.

11. Andrea Romanoni, Matteo Matteucci. "TAPA-MVS: Textureless-Aware PAtchMatch Multi-View Stereo" In Proceedings of the IEEE/CVF International Conference on Computer Vision, pp. 10413-10422, Seoul, Korea, IEEE, 2019. [doi:10.1109/ICCV.2019.01051](https://doi.org/10.1109/ICCV.2019.01051) **GII-GRIN-SCIE Class 1 (A++)**

I supervised the Post-Doc doing the implementation of the method, discussed and suggested improvements on the technique, supervised and revised the writing of the paper as well as the rebuttal process (this conference has a rebuttal phase).

12. Gianluca Bardaro, Mohamed El-Shamouly, Giulio Fontana, Ramez Awad, Matteo Matteucci. "Toward model-based benchmarking of robot components". In Proceedings of 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pp. 1682-1687, IEEE, Macau, China, 2019. [doi:10.1109/IROS40897.2019.8967682](https://doi.org/10.1109/IROS40897.2019.8967682) **GII-GRIN-SCIE Class 1 (A+)**

I coordinated the whole research work this paper originated from, I co-invented the original idea, I supervised the PhD student developing and evaluating the system, I participated in the writing and reviewing of the paper.

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I co-supervised, together with the PhD student, the Master student doing the implementation of the method, I co-invented the original idea, I participated in the writing and reviewing of the paper.

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I co-supervised, together with the PhD student, the Master student doing the implementation of the method, I co-invented the original idea, I participated in the writing and reviewing of the paper.

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I supervised the PhD student doing the implementation of the method, I co-invented the original idea, I participated to the writing and reviewing of the paper.

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