



Andrea Masciadri

"If you want to build a ship, don't drum up people together to collect wood and don't assign them tasks and work, but rather teach them to long for the endless immensity of the sea." – Antoine de Saint Exupery

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OBJECTIVES

Passionate about technology and science, during my master's studies I got to know the world of research and I really fell in love with it.

Since then, I have been engaged in several projects with a common denominator: **to deepen aspects of technology that can be of help to other people.**

My goal is to use my **problem solving** and **leadership skills** to seek research funding to create new research opportunities, and to help the scientific community to get small steps forward in our lives.

HOBBIES

Sailing, trekking, skiing and wood carving! Then whoops... cooking.

H-INDEX: 5

*GOOGLE SCHOLAR

Education

2020 • PhD in Computer Science

Scholarship granted from the Italian Ministry of Instruction

DEIB Politecnico di Milano – Assistive Technology research group

"Heterogeneous data collection and analysis for wellness assessment"

Supervisor: Prof. Fabio Salice.

2015 • Master Degree in Computer Science and Engineering

Politecnico di Milano – Data engineering track

"Unsupervised methods for activities of daily living drift modeling and recognition" Supervisor: Prof. Matteo Matteucci.

2013 • Bachelor's degree in Computer Science

Politecnico di Milano

2010 • High School diploma

ITIS Magistri Cumacini

Current position

2020 - now • Postdoc researcher

DEIB - Politecnico di Milano

"Metrics and methods for the evaluation of Health Related Quality of Life":

the research program aims to identify, design and implement algorithms to assess the quality of life of fragile people living in instrumented smart environments.

2016 - now • External IT consultant on research projects

- *"Arts et Métiers ParisTech"*: design and implementation of a system to collect and analyze motion data for the rehabilitation of people affected by Dementia.
- *"Fondazione per la ricerca sulla fibrosi cistica"*: research and development of a software to support an innovative clinical test in collaboration with Stanford University and Azienda Ospedaliera Universitaria Integrata di Verona
- *"CRAMS"*: IT consultant for the achievement of the INTERREG ITALIA SVIZZERA V-A CITY FOR CARE ID 1510020 project objectives: Services for community integration

Short Bio

Andrea Masciadri (Phd in Computer Science, Politecnico di Milano, 2020) is a Post-doc research assistant at Politecnico di Milano.

From 2016 he is a member of the Assistive Technology Group headed by prof. Fabio Salice, contributing to the study of a technological system for data collection and analysis to improve the quality of life of fragile people, first as a PhD student, then as a research assistant.

From the beginning of his PhD studies, he is determined to pursue his personal and professional career as a researcher:

- author of multiple papers published in journals and international conferences,
- participation in many research projects (ALMA, BRIDGe, MEP, etc.),
- scientific paper reviewers,
- teaching assistant for various courses (Software Engineer, Pervasive system, etc.),
- supervisor of Master thesis students,
- academic tutor during the last two editions of the ASP (Alta Scuola Politecnica) courses.

For several years, he has been working as an IT consultant in support of research projects involving the study, design and implementation of innovative systems.

In 2019, together with prof. Fabio Salice and prof. Sara Comai, he founded LyoTech, a Politecnico di Milano spin-off to enhance the results obtained from research by making them available to the community of fragile people.

He is currently involved in the research of new methods to **detect** and **characterise Behavioural Drift** in elderly people living in Smart Environments, analysing data collected through Environmental Sensors. Detecting Behavioural changes from data streams involves the **Recognition of Activities of Daily Living** using unsupervised methods, the **Localisation** of people in **Indoor Environments**, and the detection of **abnormal behaviours** and **Concept drifts**.

Achievements

2019 • LyoTech foundation – Politecnico di Milano spin-off

LyoTech deals with the technology transfer process of the research carried out by the assistive technology group (ATG) of Politecnico di Milano during my PhD thesis. This is a really important step for me, because it demonstrates the impact of my studies on the community.

2019 • Best poster award @ Colloquia Doctoralia

Prize awarded by companies during the presentation of the XXXII cycle doctoral thesis at DEIB, Politecnico di Milano.

2018 • Professional Engineer

I passed the Italian government exam to obtain the license of profession Engineer – “Ingegnere dell’Informazione”

Other Certificates

2021 • Cloud computing Foundations – Duke University

online non-credit course authorized by Duke University and offered through Coursera

Research activities

2019 - now • Research assistant (Assegnista di ricerca)

"Metrics and methods for the evaluation of Health Related Quality of Life": the research program aims to identify, design and implement algorithms to assess the quality of life of fragile people living in instrumented smart environments.

2016 – 2019 • PhD Fellow in Computer Science @ Politecnico di Milano

2016 – 2016 • Collaboration assignment for research activities@ Politecnico di Milano

Research and development of IoT innovative software solutions in the frame of BRIDGE project (ATG group in Politecnico di Milano -Como campus).

Professional activities

2016 - now • IT consultant

"Arts et Métiers ParisTech", "Fondazione per la ricerca sulla fibrosi cistica", "CRAMS"

2019 - 2019 • Company trainer@ Aquis S.r.l.

Course owner, teacher: "Analisi funzionale informatica"

2016 - 2016 • Software Engineer @ RSR s.r.l. (via Montale 3, Bulgarograsso - CO Italy)

Design and implementation of an indoor network of smart sensors using an innovative protocol.

2013-2016 • Freelance web developer

Studio Arrighi - via Morazzone 21 Como (CO), SunClub - via Oltrecolle 143 Como (CO), SOL3 - via Lombardia, 14 Castano Primo (MI).

Teaching activities

2020-2022 • Teaching assistant @ Politecnico di Milano

Computing systems, Engineering Physics- Master Degree (taught in English)

2017-2020 • Teaching assistant @ Politecnico di Milano

Software Engineering, Computer Science and Engineering - Bachelor Degree

2019-2020 • Teaching assistant @ POLIMI and Università Commerciale Luigi Bocconi

Enterprise ICT Architectures, Master of Science in Cyber Risk Strategy and Governance (taught in English)

2018-2019 • Course owner, Teacher @ Aquis S.r.l.

Training for professionals on Software and Requirements Engineering

2017-2019 • Teaching assistant @ Politecnico di Milano

Pervasive Systems, Computer Science and Engineering - Master Degree (taught in English)

2016-2017 • Tutor @ Politecnico di Milano

Computer Architectures and Operating Systems, Computer Science and Engineering - Bachelor Degree

2016-2017 • Tutor @ Politecnico di Milano

Informatics, Management Engineering - Bachelor Degree

Other academic activities

2021 • Special Track Chair @ ACM International Conference on Information Technology for Social Good

Organizer of the Special Track ITAC@GoodIT: Information Technology against COVID19 (<https://itac.polimi.it/> - <http://www.grc.upv.es/goodit2021/>)

2020-now • Certified Journal Reviewer @ MDPI Journals.

Technologies (ISSN 2227-7080)

International Journal of Environmental Research and Public Health (ISSN 1660-4601)

2018 • Publicity Chair @ ACM Symposium on Applied Computing.

Digital Life for Human Well-being track of the 34th ACM Symposium on Applied Computing.

2017-2020 • Academic tutor @ Alta Scuola Politecnica (ASP).

2019-2020 ALZGAR project – Politecnico di Milano and Politecnico di Torino

2017-2018 CLONE project – Politecnico di Milano and Politecnico di Torino

2017 • European project partners meeting

Presentation of research activity at Emercare partners (Helsinki – Finland) to establish new academic partners and find research funding.

2017-now • Presentations in International conferences

- 2021 ACM GoodIT (Rome – Italy) – Oral presentation
- 2019 IEEE SMC19 (Bari – Italy) – Oral presentation
- 2018 WINSYS Conference (Porto - Portugal) – Oral presentation
- 2018 KDAH-CIKM Conference (Turin - Italy) – Oral presentation
- 2017 AAATE Conference (Sheffield - UK) – Oral presentation

2016-now • Side collaboration to other department projects

- MEP - Maps for Easy paths – PoliSocial award 2014
- Alma – AAL Joint Programme
- Human localisation using Thermal Array Sensor
- On-demand Navigation Assistant
- Medicine Reminder for Independent Living
- Caregiver cloud service

2016-now • Master Thesis supervisor

- *Drift detection toward wandering in persons affected by cognitive decline* – Mario Di Odoardo
- *Independent Older Adults: A Characterization of Activities, Anomalies due to Inactivity and Non-Invasive Sensing Devices to Support AAL Solutions Development* – Carmelo Scarantino
- *An indoor localization system for gated model villages* – Fabrizio Danese

- *Fine grained localization system using thermocamera* – Andrea Locati
- *Activity of Daily Living Recognition through Ontological Reasoning* – Samuele Galli
- *Using Concept Drift Detectors of MOA Framework to Detect Behavioral Drift in Home Automation Dataset* - Roza Shafiei
- *Proximity Detection Using Bluetooth Low Energy Technology to Identify Seated People* – Daniel Rosato
- *A Heuristic Method for Suboptimal Antenna Positioning in a Limited Environment for Localization System* - Geng Dongjie, Wan Jingwei
- *Individual Quality of Life Description: Definition and Computation of Wellness Indexes* – Marco Sacchi
- *Comparison of concept drift detectors in a health-care facility dataset to detect behavioral drifts* – Fabio Masciopinto
- *Bridge 2.0: a Framework for Elderly Independence and Ambient Assisted Living* – Amedeo Stroppolo
- *Fall detection. Commercial and scientific research* - Ilnaz Jahanbani
- *House Status and People Number Estimation Algorithm for Smart Home* - Changhong Lin
- Forthcoming thesis: Sofia Ghezzi, Berk Batuhan Gurhan, Francesco Di Rienzo

Selected Publications

[2019] Andrea Masciadri, Sara Comai, and Fabio Salice. Wellness assessment of Alzheimer’s patients in an instrumented Health-care facility. *Sensors* 2019, 19, 3658.

This paper describes the technological system, the algorithms, and the case study we have designed for the recognition of Behavioral Drift in healthcare facilities. Most of my activities during the PhD were focused on the realization of the proposed system, unique in its kind, which allows the creation of the dataset needed for our research activities.

[2018] Fabio Veronese, Andrea Masciadri, Sara Comai, Matteo Matteucci and Fabio Salice. Behavior Drift Detection based on Anomalies Identification in Home Living Quantitative Indicators. *Technologies*. DOI:10.3390/technologies6010016.

This paper reports our approach to the recognition of behavioral drifts in the home environment.

[2017] Anna A. Trofimova, Andrea Masciadri, Fabio Veronese, and Fabio Salice. Indoor human detection based on Thermal Array Sensor data and adaptive background estimation. *Journal of Computer and Communications*, 5, 16-28. DOI: 10.4236/jcc.2017.54002.

This paper reports the results of a study that has been done on the application of a thermal sensor for the non-invasive detection of a person in an indoor environment. The proposed approach and technology have proved to be of interest as they can be used for various applications.

Personal Skills and Competences

Language

Mother tongue: Italian

Foreign languages: English

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
Proficient	Proficient	Proficient	Proficient	Proficient

Social skills

Teamwork and Communication: thanks to the relations established during my PhD studies, I had the opportunity to work in groups with people with a very diverse cultural and professional background.

Organisational skills

Planning: I am able to independently and efficiently organize my work and to collaborate in working groups, with a natural inclination to lead it.

Problem solving and Research skills: during my PhD I devoted a lot of energy to develop soft skills and other competences necessary to support research activities. In particular, I attended several courses from the PhD School such as: RESEARCH SKILLS, ETHICS TECHNOLOGY AND SOCIETY, and POLIMI 4 CASA ITALIA.

Technical skills and competences

Software Engineering, System architectures, Data analysis.

Others

Car driving license: category B vehicles.

Patente di abilitazione al comando di imbarcazioni da diporto a vela e a motore senza limiti.

Main research

The problem that drives my research involves the worldwide health-care system, increasingly under pressure from a demographic trend that sees a dramatic growth in the average age of the population. In this scenario, Ambient Assisted Living plays a central role to monitor and support the **independent living of elderly and fragile people**, supporting caregivers and families to provide focused intervention when it is needed. From September 2017, I am managing the design and development of a technological system to detect the activities performed by people at home and/or in residences - restricted environments. Smart sensors are used to collect data about every inhabitant that are subsequently analyzed to infer his/her behavior and anomalies. It is worth noting that the considered anomalies are both short-term anomalies (timing violations, as an unexpected stay in a specific area of the residence or house, or space violation, as an escape attempt) and long-term anomalies (behavioral drift). The continuous activity monitoring system is the starting point for two parallel projects: the "mutual reassurance" project and the "Behavioural drift identification" project (in the context of autonomous life). The latter is the main focus of my long-term research: the possibility of gradually introducing compensation mechanisms as the drift increases in the person's daily activities. This aspect, in the vision of the project, could allow to leave the person in his / her living environment for a longer period, preserving the quality of life, slowing down cognitive decline and reducing costs for both society and the family.

Light-obtrusive monitoring system for residences

By collecting data from inhabitants and operators (continuous monitoring), it is possible to identify the initial condition of an inhabitant (inhabitant finger print - e.g. depression, apathy, wandering) and, successively, to provide an analysis/report of the improvements or stationary effects of the users with the aim of evaluating both the therapeutic aspects and the impact of the environment (e.g. the social interaction among people, the dependency from operators, the physical activity, permanence and attendance of the spaces). This system is currently under experimentation in Monza at "**Il Paese ritrovato**", the first village in Italy exclusively designed by the "La Meridiana due" cooperative as a pioneering care facility where 64 people affected by Alzheimer are living independently in a restricted and loosely controlled environment.

Unobtrusive monitoring system for smart care at home

In the last years, we managed the study and the implementation of an experimental system currently active, in an apartment. The system is composed by an unobtrusive localization system, a monitoring system for energy consumption of some household appliances (washing machine, microwave, TV and dishwasher), an in/out detection systems and, always in the absence of contact, a system for night rest condition (agitation, estimation of breath rate and heart rate). Sensor data allow to identify some of the activities of daily living (ADL) and Instrumental ADL (IALD) in addition to the permanence in the spaces of the house and the environmental conditions (temperature and brightness).

Side research

From January 2019, I'm cooperating with *Arts et Métiers ParisTech* (a French engineering and research graduate school) and *CRAMS* (centro di ricerca arte musica e spettacolo) as an external consultant on the research projects "**Moving on Music, Together**". The study evaluates the effects of two distinct kinds of ateliers - of dance and of gymnastic - proposed to groups of up to ten patients affected by Alzheimer Disease. The movements of patients are recorded and analysed in order to quantify relevant individual features and the impact of music on people with mild cognitive impairments.

From 2016 to 2018, I have been an external consultant for a non-profit organisation "**Fondazione per la fibrosi cistica**" (Cystic Fibrosis foundation). I was engaged in the research and development of a imaged-based software to support an innovative clinical test in collaboration with **Stanford University** and **Azienda Ospedaliera Universitaria Integrata di Verona** over the **GRANT FFC#5/2016**.

Full Publication List

FORTHCOMING

- [2021 - 1] Andrea Masciadri, Sara Comai, Alessandro Campi and Fabio Salice. An overview on Concept Drift studies for behavioral monitoring. TO BE SUBMITTED
- [2021 - 2] Sofia Ghezzi, Andrea Masciadri, Sara Comai, and Fabio Salice. A device for monitoring dressing in people with dementia. TO BE SUBMITTED
- [2021 - 3] Alessandro Baserga, Federico Grandi, Andrea Masciadri, Sara Comai, and Fabio Salice. High-Efficiency Multi-sensor system for chair usage detection. TO BE SUBMITTED
- [2021 - 4] Andrea Masciadri, Sara Comai, and Fabio Salice. Characterization of behavior in subjects affected by Alzheimer's using localization data. TO BE SUBMITTED

2021

- [j9] Andrea Masciadri, Sara Comai, and Fabio Salice. Detection Fall Model Based on Wearable and Reference Barometric Sensors. SUBMITTED TO Pervasive and mobile computing (Elsevier Q1 Journal)
- [j8] Andrea Masciadri, Changhong Lin, Sara Comai, and Fabio Salice. People Run-time Multi-Resident Number Estimation Method for Smart Homes. SUBMITTED TO Information Fusion (Elsevier Q1 Journal).
- [c16] Francesco Corazza, Francesco Troisi, Sara Comai, Andrea Masciadri, Fabio Salice. CESS: Closed Environment Safety System. In Proceedings of the Conference on Information Technology for Social Good (pp. 133-138). <https://doi.org/10.1145/3462203.3475879>
- [j7] Gloria Bellini, Marco Cipriano, Nicola De Angeli, Jacopo Pio Gargano, Matteo Gianella, Andrea Masciadri, Fabio Salice, and Sara Comai. Understanding Social Behavior in a Health-care Facility from Localization Data: a Case Study. *Sensors* 2021, 21(6), 2147; <https://doi.org/10.3390/s21062147>

2020

- [c15] Gloria Bellini, Marco Cipriano, Nicola De Angeli, Jacopo Pio Gargano, Matteo Gianella, Gianluca Goi, Gabriele Rossi, Andrea Masciadri, and Sara Comai. Alzheimer's Garden: Understanding Social Behaviors of Patients with Dementia to Improve Their Quality of Life. Proceedings of the International Conference on Computers Helping People with Special Needs. Springer, Cham, 2020. DOI: 10.1007/978-3-030-58805-2_46
- [c14] Eva Bafaro, Debora Di Bartolo, Andrea Masciadri, Sara Comai, and Fabio Salice. Monitoring cooker activities using a Grid-EYE infrared array sensor. Proceedings of the 6th EAI International Conference on Smart Objects and Technologies for Social Good September 2020 Pages 1–5. DOI: 10.1145/3411170.3411245.

2019

- [j6] Andrea Masciadri, Sara Comai, and Fabio Salice. Wellness assessment of Alzheimer's patients in an instrumented Health-care facility. *Sensors* 2019, 19, 3658; DOI:10.3390/s19173658.
- [c13] Andrea Masciadri, Sara Comai, and Fabio Salice. SMARE: Semi-supervised Method for Activities of daily living REcognition. 2019 IEEE International Conference on Systems, Man and Cybernetics (SMC). IEEE, 2019. DOI: 10.1109/SMC.2019.8914279
- [c12] Andrea Masciadri, Marco Sacchi, Sara Comai, and Fabio Salice. Wellness Indexes to assess Quality of Life: a technological support. Proceedings of the 5th EAI International Conference on Smart Objects and Technologies for Social Good ISBN: 978-1-4503-6261-0 DOI:10.1145/3342428.3342694

- [c11] Brusadelli S, Tocchetti A, Masciadri A, Comai S, and Salice F. Detecting Social Interaction in a Smart Environment. Proceedings of AAATE2019, Technology and Disability.
- [c10] Andrea Masciadri, Carmelo Scarantino, Sara Comai, and Fabio Salice. Understanding Home Inactivity for Human Behavior Anomaly Detection. Proceedings of the 5th EAI International Conference on Smart Objects and Technologies for Social Good ISBN: 978-1-4503-6261-0 DOI:10.1145/3342428.3342658
- [b1] Marco Brambilla, A Saviet Javadian, and Andrea Masciadri. Data-driven user profiling for smart ecosystems, appeared in Smart Living between Cultures and Practices. A design oriented perspective, pp 84-98, Mandragora – ISBN: 978-88-7461-496-7. 30/12/

2018

- [j5] Fabio Veronese, Andrea Masciadri, Sara Comai, Matteo Matteucci and Fabio Salice. Behavior Drift Detection based on Anomalies Identification in Home Living Quantitative Indicators. Technologies. DOI:10.3390/technologies6010016.
- [c9] Bianchi S, Imtiaz A, Amato F, Crovari P, Pasquarelli M G, Toldo M, Yuyar E, Masciadri A, and Comai S. CLONE: an Experiment with a Wearable Device in a Village for Alzheimer's Patients. Proceedings of the 4th EAI International Conference on Smart Objects and Technologies for Social Good, ACM ISBN 978-1-4503-6581-9/18/11, DOI: 10.1145/3284869.3284906
- [c8] Daniel Rosato, Andrea Masciadri, Sara Comai, and Fabio Salice. . Non-invasive monitoring system to detect sitting people. Proceedings of the 4th EAI International Conference on Smart Objects and Technologies for Social Good, ACM – ISBN 978-1-4503-6581-9/18/11, DOI: 10.1145/3284869.3284907
- [c7] Sara Comai, Fabio Salice, Emanuele De Bernardi, Andrea Masciadri and Alessandro Campi. Smart Mobility: Walkable and Accessible Cities. Proceedings of i-CiTies 2018.
- [c6] Andrea Masciadri, Fabio Veronese, Sara Comai, Ilaria Carlini and Fabio Salice. Disseminating Synthetic Smart Home Data for Advanced Applications. CIKM 2018 Workshops (Vol. 2482, pp. 1-7). CEUR-WS.
- [c5] Andrea Masciadri, Ilaria Carlini, Sara Comai and Fabio Salice. Supporting Alzheimer's residential care – A novel indoor localization system. Proceedings of ICETE 2018, ISBN: 978-989-758-319-3 DOI: 10.5220/0006859502720278.
- [c4] Sara Comai, Emanuele De Bernardi, Andrea Masciadri, Matteo Matteucci, Fabio Salice and Fabio Veronese. ALMA: An Indoor Localization and Navigation System for the Elderly. Smart Objects and Technologies for Social Good. DOI10.1007/978-3-319-76111-4_9.

2017

- [j4] Bergamini et al. Ratiometric sweat secretion optical test in cystic fibrosis, carriers and healthy subjects. Journal of Cystic Fibrosis; DOI10.1016/j.jcf.2017.12.003.
- [j3] Anna A. Trofimova, Andrea Masciadri, Fabio Veronese, and Fabio Salice. Indoor human detection based on Thermal Array Sensor data and adaptive background estimation. Journal of Computer and Communications, 5, 16-28. DOI: 10.4236/jcc.2017.54002.
- [j2] Stefano Gorla, Sara Comai, Andrea Masciadri, and Fabio Salice. BigEar: Ubiquitous Wireless Low-Budget Speech Capturing Interface. Journal of Computer and Communications, 5, 60-83. DOI: 10.4236/jcc.2017.54005.

[c3] Andrea Masciadri, Anna A. Trofimova, Matteo Matteucci, and Fabio Salice. Human Behavior drift detection in a Smart Home environment. *Studies in Health Technology and Informatics*, 2017. DOI: 10.3233/978-1-61499-798-6-199.

[c2] Fabio Veronese, Andrea Masciadri, Sara Comai, Matteo Matteucci, and Fabio Salice. Quantitative Indicators for Behavior Drift Detection from Home Automation Data. *Studies in Health Technology and Informatics*, 2017. DOI: 10.3233/978-1-61499-798-6-208

2016

[j1] F. Veronese, A. Masciadri, A. A. Trofimova, M. Matteucci, and F. Salice. Realistic Human Behaviour Simulation for quantitative Ambient Intelligence Studies. *Technology and Disability*, 2016, 28.4: 159-177. DOI: 10.3233/TAD-160453.

2015

[c1] Federico Bianchi, Andrea Masciadri, and Fabio Salice. ODINS: On-Demand Indoor Navigation System RFID Based. *Studies in health technology and informatics*, 2015, 217: 341. ISBN978-1- 61499-565-4 (print) | 978-1-61499-566-1 (online), DOI10.3233/978-1- 61499-566-1-341.