Roberto Sassi

Nationality: Italian | **Phone number:** (+39) 3204378915 (Mobile) | **Phone number:** (+39) 0250316236 (Work) | **Email address:** roberto.sassi@unimi.it |

Address: Dipartimento di Informatica, Università degli Studi di Milano, via Celoria 18, 20133, Milano, Italy (Work)

WORK EXPERIENCE

DIPARTIMENTO DI INFORMATICA, UNIVERSITÀ DEGLI STUDI DI MILANO – MILAN, ITALY

FULL PROFESSOR ("PROFESSORE ORDINARIO") IN COMPUTER SCIENCE (INF/01) – NOV 2019 – CURRENT

Taught graduate and undergraduate classes on: digital signal, image and video processing, biomedical signal processing.
Research interests include:

- Design and development of computational tools able to automatically process complex data, such as biomedical signals and medical images. The applications are at the intersection of signal processing, computational intelligence and medicine, with particular attention to explainable and interpretable AI.
- Time series analysis, with focus on non-linear methods and long range dependences in heart rate variability
- Biometrics and techniques which might help ensuring privacy when adopting identification procedures employing biometrics
- Assisted living / healthy aging facilitating technologies

DIPARTIMENTO DI INFORMATICA, UNIVERSITÀ DEGLI STUDI DI MILANO – MILAN, ITALY

ASSOCIATE PROFESSOR ("PROFESSORE ASSOCIATO") IN COMPUTER SCIENCE (INF/01) – MAR 2015 – OCT 2019

DIPARTIMENTO DI TECNOLOGIE DELL'INFORMAZIONE, UNIVERSITÀ DEGLI STUDI DI MILANO – CREMA, ITALY

ASSISTANT PROFESSOR ("RICERCATORE CONFERMATO") IN COMPUTER SCIENCE (INF/01) – JAN 2004 – FEB 2015

SENSURE S.R.L. – CREMA, ITALY

SCIENTIFIC ADVISOR (PART TIME) AND CO-OWNER – JAN 2008 – APR 2010

Sensure s.r.l. is a successful hi tech industrial spin off of the University of Milan active in the field of manufacturing quality control through machine vision and state of the art neural classifiers. Prof. Sassi, with endorsement of the University, acted as part time scientific advisor in the starting phase up to the point in whi ch the company started being profitable.

DIPARTIMENTO DI BIOINGEGNERIA [BIOMEDICAL ENGINEERING], POLITECNICO DI MILANO – MILAN, ITALY

POSTDOCTORAL RESEARCHER – APR 2003 – DEC 2003

Supervisor: Prof. S. Cerutti
Conducted research on ECG signals of patients undergoing atrial fibrillation in collaboration with prof. Pierre Maison-Blanche (Lariboisiere University Hospital, Paris, France) and Ela Medical (Paris, France).

DEPARTMENT OF MATHEMATICS, IMPERIAL COLLEGE – LONDON, UNITED KINGDOM

VISITOR (APPLIED MATHEMATICS) – OCT 2003 – DEC 2003

Supervisor: Prof. Richard V. Craster
Conducted research on spectral algorithms for reaction-diffusion equations.

DEPARTMENT OF APPLIED MATHEMATICS AND STATISTICS, UNIVERSITY OF CALIFORNIA AT SANTA CRUZ (UCSC) – SANTA CRUZ, UNITED STATES

POSTDOCTORAL RESEARCHER – SEP 2001 – JUN 2002

Supervisor: Prof. Neil J. Balmforth
Conducted research on non-Newtonian fluids (common in biology), in particular when one dimension of the fluid is in first approximation negligible with respect to the others (lubrication approximation).

EDUCATION AND TRAINING

NOV 1997 – OCT 2000 Milan, Italy
DOTTORATO DI RICERCA IN BIOINGEGNERIA (PH.D. IN BIOMEDICAL ENGINEERING) Dipartimento di Bioingegneria [Biomedical Engineering], Politecnico di Milano

Ph.D. dissertation (defended on March 5, 2001): "Analysis of heart rate variability complexity through fractal and multivariate approaches". Supervisor: Prof. Sergio Cerutti
Research activities during the Ph.D.:

University of California at Santa Cruz, (CA, USA) & ISAC-CNR, Torino (Italy)
Supervisors: Prof. Neil J. Balmforth and Dr. Antonello Provenzale
Conducted research on hierarchically coupled maps. A large number of logistic maps were coupled together as a mathematical metaphor for complex natural systems with hierarchical organization. (3/2000–6/2000, 11/2000)

ISAC-CNR, Torino & Politecnico di Milano, (Italy)
Supervisors: Dr. Antonello Provenzale and prof. Maria Gabriella Signorini
Conducted research on the possible multifractal structure of heart rate variability with application to 24-hours inter-beats series. (10/1999–4/2000)

Università degli Studi di Pavia (Italy) & Politecnico di Milano (Italy)
Supervisors: prof. Maria Gabriella Signorini and prof. Giovanni Magenes
Conducted research on fetal monitoring. (3/1999–6/2000)

Woods Hole Oceanographic Institution (MA) & University of California at Santa Cruz (CA), USA
Supervisor: Prof. Neil J. Balmforth
As GFD fellow, conducted research on phase-coupled nonlinear oscillators (continuous and discrete Kuramoto models). The transition to synchronization in the continuum model was analyzed. Numerical methods and perturbation theory were used to study the patterns of synchronization that form beyond transition. (6/1999–8/1999, 12/1999)

Columbia University, New York (NY), USA
Supervisor: Prof. Edward A. Spiegel
Conducted research on chaotic nonlinear dynamical system displaying riddled basins of attraction. (10/1998–12/1998).

SEP 1990 – DEC 1996 Milan, Italy
LAUREA (EQUIVALENT TO MASTER & BACHELOR DEGREES) IN ELECTRONIC ENGINEERING (SUMMA CUM LAUDE) Politecnico di Milano

Master's Thesis (defended on December 20, 1996, in Italian): "Studio dell'entropia approssimata per la classificazione di serie temporali: applicazioni al segnale di variabilità cardiaca" (Heart Rate Variability signals classification through Approximate Entropy).
Supervisors: Prof. Sergio Cerutti and prof. Maria Gabriella Signorini

LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C2	C2	C2	C2	C2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

PUBLICATIONS

Selected publications:

- Samara Soares Leal, Stavros Ntalampiras, and Roberto Sassi, **Speech-based Depression Assessment: A Comprehensive Survey**, *IEEE Transactions on Affective Computing*, 2024. ISSN: 1949-3045. DOI:10.1109/TAFFC.2024.3521327
- Muhamed Vila, Massimo W. Rivolta, Cristian A. Barrios Espinosa, Laura A. Unger, Armin Luik, Axel Loewe, Roberto Sassi, **Recommender System for Ablation Lines to Treat Complex Atrial Tachycardia**, *Computer Methods and Programs in Biomedicine*, vol. 231, pp. 107406 (13 pages), 2023. ISSN: 0169-2607. DOI:10.1016/j.cmpb.2023.107406
- M. Bodini, M.W. Rivolta, R. Sassi, **Opening the black box: Interpretability of machine learning algorithms in electrocardiography**, *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, vol. 379(2212), art. no. 20200253, pp. 1-13, 2021. ISSN: 1364-503X DOI:10.1098/rsta.2020.0253

- Massimo W. Rivolta, Md. Aktaruzzaman, Giovanna Rizzo, Claudio L. Lafortuna, Maurizio Ferrarin, Gabriele Bovi, Daniela R. Bonardi, Andrea Caspani, Roberto Sassi, **Evaluation of the Tinetti score and fall risk assessment via accelerometry-based movement analysis**, *Artificial Intelligence in Medicine*, vol. 95, pp. 38-47, 2019. ISSN: 0933-3657. DOI:10.1016/j.artmed.2018.08.005
- Ruggero Donida Labati, Enrique Muñoz, Vincenzo Piuri, Roberto Sassi, Fabio Scotti, **Deep-ECG: Convolutional Neural Networks for ECG biometric recognition**, *Pattern Recognition Letters*, vol. 126, pp. 78-85, 2019. ISSN: 0167-8655. DOI:10.1016/j.patrec.2018.03.028

A complete list of publications can be found at: https://sassi.di.unimi.it/bibliography.html

PROJECTS

1 MAR 2024 – CURRENT
AIDH

Co-Principal Investigator of the project: "AIDH - Adaptive AI methods for Digital Health", funded by a cascade call of the partenariat "FUTURE ARTIFICIAL INTELLIGENCE – FAIR", Italian NRRP - Mission M4 - Component C2 (budget of the unit: € 650,000).

1 NOV 2023 – CURRENT
INSIDE-HEART

Scientific Coordinator (along with Massimo W. Rivolta) for the Università degli Studi di Milano unit in the project: "INSIDE-HEART - multI-discipliNary, multi-Sectoral and multi-national trainIng network on Digital biomarkErs for supraventricular arrHythmia charactErizAtion and Risk assessmenT", call HORIZON-MSCA-2022-DN-01 (Marie Skłodowska-Curie Doctoral Networks). Grant agreement number: 101119941 (budget of the unit: € 259,437.60 for one Doctoral Researcher).

20 MAY 2023 – CURRENT
SOLITAIRE

Co-PI for the Università degli Studi di Milano unit in the project: "SOLITAIRE - Digital interventions for Social isOLation In youThs And theIR familiEs" funded by by the European Union - Next Generation EU - NRRP M6C2 - Investment 2.1 Enhancement and strengthening of biomedical research in the NHS (budget of the unit: € 200,000).

1 SEP 2022 – CURRENT
MUSA

Deputy-PI for the Work Package 2 part of the Spoke 2 led by Università degli Studi di Milano in the project: "MUSA – Multilayered Urban Sustainability Action – project, funded by the European Union" funded by by the European Union - Next Generation EU - NRRP M4 - Investment 1.5: Strengthening of research structures and creation of R&D "innovation ecosystems", set up of "territorial leaders in R&D". (budget of the WP: € 4,700,000).

OCT 2017 – APR 2022
MY-ATRIA

Scientific Coordinator for the Università degli Studi di Milano unit in the project: "MY-ATRIA - MutlidisciplinarY training network for ATrial fibRillation monItoring, treAtment and progression", call Horizon 2020 H2020-MSCA-ITN-2017 (Marie Skłodowska-Curie Innovative Training Networks). Grant agreement number: 766082 (budget of the unit: € 258,061.32 for one Early Stage Researcher).

JUN 2021 – DEC 2021
COVIDSQUARED

Scientific Coordinator of the project: "COVIDSQUARED - automatic COmputation of cardioVascular arrhythmIc risk from ECG data of COVID-19 patients", call FISR 2020 COVID - Fase I. Project # FISR2020IP_01990. Budget: € 70.471,38 of which € 44.066,69 for the local unit.

AUG 2017 – FEB 2020
NESTORE

Scientific Coordinator for the Università degli Studi di Milano unit, as Third Party of Flextronics S.p.A (Milano, Italia), in the project: "NESTORE - Novel Empowering Solutions and Technologies for Older people to Retain Everyday life activities", call EU Horizon 2020 H2020-SC1-2016-2017 (Personalised Medicine). Grant agreement number: 769643 (budget of the Third Party: € 40,000).

FEB 2014 – OCT 2015
SMARTA

Scientific Coordinator for the Università degli Studi di Milano unit in project: "SMARTA -Sistema di Monitoraggio Ambientale con Rete di sensori e Telemonitoraggio indossabile a supporto di servizi di salute, prevenzione e sicurezza per l' Active Aging" funded by Regione Lombardia through the call "Smart Cities" (budget of the unit: € 500,000).

ACADEMIC ACTIVITY

Direction of research activities: organization activity

Director of the Biomedical Signal Processing (BiSP) laboratory, in the Computer Science department of the University of Milan (from July 2008 to June 2015 and from February 2018 to today).

Since October 2022, **Coordinator** of the **Board of the Ph.D. in Computer Science** at the University of Milan.

Director of the Biomedical Signal Processing (BiSP) group, in the Computer Science department of the University of Milan (from July 2008).

Supervisor of the post-doc (Italian type A) Dr Md Moklesur Rahman, for the research: “Adaptive AI methods for Digital Health”. From 01-09-2024 to 30-08-2025.

Supervisor of the assistant professor (RTD-A) Dr Arman Kheirati Roonizi, in the context of project "MUSA – Multilayered Urban Sustainability Action" funded by the European Union – NextGenerationEU, under the National Recovery and Resilience Plan (NRRP) Mission 4 Component 2 Investment Line 1.5. From 01-12-2022 on.

Supervisor of the post-doc (Italian type B) Dr Samara Leal, in the context of project "SOLITAIRE - Digital interventions for Social isOLation In youThs And theIR familiEs" funded by the European Union – NextGenerationEU, NRRP Mission 6 Component 2 Investment Line 2.1. From 01-11-2023 to 30-04-2025. Dr Leal accepted a second post-doc position (Italian type A), still in the same research context and co-supervised with prof. Stavros Ntalampiras from 01-05-2025 on.

Supervisor of the post-doc (Italian type B) Dr Davide Coluzzi, in the context of project "MUSA – Multilayered Urban Sustainability Action" funded by the European Union – NextGenerationEU, under the National Recovery and Resilience Plan (NRRP) Mission 4 Component 2 Investment Line 1.5. From 01-09-2023 to 31-10-2024.

Supervisor of the post-doc (Italian type A) Dr Arman Kheirati Roonizi, for the research: “Cardiac Abnormalities Identification in Multi-channel ECG Recording”. From 01-10-2021 to 30-11-2022.

Supervisor of the post-doc (Italian type B) Dr Massimo Walter Rivolta, for the research: “Development of algorithms for automatic feature extraction from biomedical signals”. From 01-06-2019 to 30-06-2020.

Supervisor of the post-doc (Italian type B) Dr Davide Coluzzi, for the research: “Algorithms development for remote monitoring and quantification of physical activity with wearable sensors to support healthy aging”. From 01-12-2018 to 31-11-2019.

Supervisor of the post-doc (Italian type A) Dr Massimo Walter Rivolta, for the research: “Study of a new ECG-based parameter, the V-index, for risk stratification of cardiac events”. From 01-06-2015 to 31-05-2019.

Supervisor of the post-doc (Italian type B) Dr Md. Aktaruzzaman, for the research: “Sviluppo di algoritmi per il monitoraggio con sensori wearable dell’attività fisica e del ritmo veglia/sonno a supporto dell’active aging” (Development of algorithms for monitoring, using wearable sensors, physical activity and sleel to support active ageing). From 01-03-2015 to 29-02-2016.

Supervisor of the post-doc (Italian type B) Dr Massimo Walter Rivolta, for the research: “Telemonitoraggio con sensori wearable a supporto dell’active aging: sviluppo di algoritmi di analisi dei dati rilevati” (Telemonitoring using werable sensors to support active ageing: developments of algoritms for the analysis of data collected”). From 01-12-2014 to 31-05-2015.

Evaluation activities

From July 2021 to Febbruary 2024 he was a member of the national habilitation board in Computer Science (**Commissione per l’Abilitazione Scientifica Nazionale**, ASN 2021, settore concorsuale 01/B1-Informatica).

In 2011 he participated as a Panel Member (Biomedical Engineering subarea) in the evaluation process to select the funded research projects for the Health Sciences 2010 call of the Portuguese Foundation for Science and Technology (Fundação para a Ciência e a Tecnologia, FCT).

Direction of research activities: supervision of Ph.D. students

Since 2024, in the context of the MSCA project INSIDE-HEART, Prof. Sassi is **advisor** of Joachim Kröner and **co-advisor of** Paul Kapust and Beatriz Cosculluela Arasanz, Ph.D. degree in computer science (40° ciclo), University of Milan.

Since 2023, Prof. Sassi is **co-advisor** of Sara Battiston, Ph.D. degree in computer science (39° ciclo), University of Milan. The research will focus on generative AI methologies to support explainability when classifying ECG signals.

Since 2022, Prof. Sassi is **advisor** of Silvia Ibrahimi, Ph.D. degree in intersectoral innovation (38° ciclo), University of Milan. The research is focusing on deep learning techniques that can eliminate or at least mitigate the learning of spurious correlations in data caming from cardiovascular applications.

From 2021 to 2024, Prof. Sassi is **co-advisor** of Md Moklesur Rahman, Ph.D. degree in computer science (37° ciclo), University of Milan. The research focused on the use of AI to electrocardiographical signals and the detection of atrial fibrillation.

From 2019 to 2021, Prof. Sassi was **advisor** of Matteo Bodini, Ph.D. degree in computer science (33° ciclo), University of Milan. The research focused on the use of AI and its explainability on large datasets of electrocardiographical signals.

From 2018 to 2022, Prof. Sassi was **advisor** of Muhamed Vila, Ph.D. degree in computer science (33° ciclo), University of Milan for the research entitled: "Atrial complex networks in endocavitary recordings during AF".

From 2015 to 2018, Prof. Sassi was **advisor** of Tewodros Mulugeta Dagnew, Ph.D. degree in computer science (31° ciclo), University of Milan for the research entitled: "Machine-Learning based analysis and computer aided classification of neuropsychiatric-disorders using neuro-imaging".

From 2014 to 2017, Prof. Sassi was **advisor** of Ebadollah Kheirati Roonizi, Ph.D. degree in computer science (29° ciclo), University of Milan for the research entitled "Adaptive Model-Based Cardiac Signals Analysis and Feature Extraction".

From 2012 to 2015, Prof. Sassi was **advisor** of Md Aktaruzzaman, Ph.D. degree in computer science (27° ciclo), University of Milan for the research entitled "Feature Extraction and Classification Through Entropy Measures"

From 2012 to 2015, Prof. Sassi was **advisor** of Massimo Walter Rivolta, Ph.D. degree in computer science (27° ciclo), University of Milan for the research entitled "Non-Blind Source Separation and Feature Extraction: Theory, Approach and Studies in Cardiac Signals".

From 2009 and 2012, Prof. Sassi was **co-advisor** of Che-Wei Lin, Joint Ph.D. degree in computer science (24° ciclo), University of Milan and National Cheng Kung University (Tainan, Taiwan) for the research entitled: "Development of a Wearable Sensor System in Health Promotion and Open Research Objectives on Parkinson's Disease Severity Recognition and Fall Risk Prediction".

From 2019 to 2022, he was a **member** of the Thesis Supervision Commitee for the Ph.D. student Corrado Ameli, Université de Luxembourg (Luxembourg), for the research entitled: "Machine learning approaches for neurodegeneration".

CONFERENCES AND SEMINARS

Organization of scientific conferences

He was **general Co-Chair** of the 6th EAI International Conference on Wireless Mobile Communication and Healthcare - MOBIHEALTH 2016, Milan (Italy) November 14-16, 2016

He was a **member of the Local Organizing Committee for IEEE EMBC 2015** (International Conference of the IEEE Engineering in Medicine and Biology Society), which was held in Milan in August 2015

He was **organizer** and **track chair** of the following international workshops:

- Fifth International Workshop on Computational Intelligence Techniques for Industrial and Medical Applications, CITIMA, within the "Signal Image Technology & Internet Based Systems conference", SITIS, Las Palmas de Gran Canaria, Spain, November 26-29, 2018.
- Fourth International Workshop on Computational Intelligence Techniques for Industrial and Medical Applications, CITIMA, within the Signal Image Technology & Internet Based Systems conference, SITIS, Jaipur, India, December 4-7, 2017.
- Third International Workshop on Computational Intelligence Techniques for Industrial and Medical Applications, CITIMA, within the Signal Image Technology & Internet Based Systems conference, SITIS, November 28-December 1, 2016 - Naples, Italy.
- Second International Workshop on Computational Intelligence Techniques for Industrial and Medical Applications, CITIMA, within the Signal Image Technology & Internet Based Systems conference, SITIS, November 23-27, 2015 - Bangkok, Thailand.
- First International Workshop on Computational Intelligence Techniques for Industrial and Medical Applications, CITIMA, within the Signal Image Technology & Internet Based Systems conference, SITIS, November 23-27, 2014, Marrakech, Morocco

Programme committee memberships

He was a member of the Programme Committee of the following international conferences:

- Euromicro Conference on Digital System Design (DSD), Special Session On Advanced Systems For Health, Wellness And Personal Assistance (ASHWPA), (from 2015 to 2023)
- IEEE Workshop on Biometric Measurements and Systems for Security and Medical Applications, BioMS (from 2010 to 2014)
- IEEE International Conference on Computational Intelligence and Virtual Environments for Measurements Systems and Applications, CIVEMSA (from 2013 to 2022).
- IEEE International Conference on Computational Intelligence for Measurement Systems and Applications, CIMSA (from 2006 to 2012)
- IEEE International Conference on Virtual Environments, Human-Computer Interfaces, and Measurement Systems, VECIMS (years: 2011 and 2012)
- IEEE International Conference on Information Technology and Applications, ITAB (in 2010)
- Conference of the European Study Group on Cardiovascular Oscillations, ESGCO (in 2014 and 2020)
- IEEE International Symposium on INnovations in Intelligent SysTems and Applications, INISTA (years: from 2014 to 2022)
- International Conference on Bio-inspired Systems and Signal Processing - BIOSIGNALS (years: from 2016 to 2021).
- IEEE International Symposium on Biomedical Imaging – ISBI (in 2016).
- Computing in Cardiology (CinC) (from 2017 to 2025).
- 2nd Healthcare Interoperability and Pervasive Intelligent System workshop (HiPIS@ICTH 2018), held with the 8th International Conference on Current and Future Trends of Information and Communication Technologies in Healthcare (ICTH 2018), November 5-8, 2018, Leuven, Belgium.

PATENTS

Method for generating and verifying security information obtained by means of biometric readings

S. Cimato, M. Gamassi, V. Piuri, D. Sana, R. Sassi, and F. Scotti, **Publication number WO/2007/113888: Method for generating and verifying security information obtained by means of biometric readings**. Deposited: 29 March 2007. Property: Università degli Studi di Milano. PCT extension of the MI2006A000641 patent. http://www.wipo.int/pctdb/en/wo.jsp?WO=2007113888

Metodo di generazione e di verifica di una informazione di sicurezza ottenuta mediante letture biometriche

S. Cimato, M. Gamassi, V. Piuri, D. Sana, R. Sassi, and F. Scotti, **Patent number MI2006A000641: Metodo di generazione e di verifica di una informazione di sicurezza ottenuta mediante letture biometriche**. Deposited: 31 March 2006. Property: Università degli Studi di Milano.

Milan , 29 Jul 2025