
BIOGRAPHICAL SKETCH

NAME: Salvatore, Christian

POSITION TITLE: Associate Professor at IUSS Pavia

EDUCATION/TRAINING:

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
University of Milano Bicocca, Milan, Italy	BSc	2009	Physics
University of Milano Bicocca, Milan, Italy	MSc	2012	Physics (Applied to Medicine)
University of Milano Bicocca, Milan, Italy	PhD	2015	Physics (Applied to Medicine)

A. Personal Statement

Christian Salvatore, Ph.D. is Associate Professor of Artificial Intelligence and Applied Physics at the Scuola Universitaria Superiore IUSS Pavia and Founder & CEO of DeepTrace Technologies, a research-driven company developing certified AI-based medical software. His research focuses on machine learning and artificial intelligence for healthcare, with emphasis on neuroimaging, early disease detection, and predictive modeling in neurodegenerative disorders and other clinical conditions. His academic contributions include development of machine learning methods for structural and functional imaging and AI-driven diagnostic and prognostic tools; his work has been applied to Alzheimer's disease, movement disorders, and oncological imaging, among other domains. His publications are widely cited (h-index 25; >3 500 citations) and include peer-reviewed studies on MRI biomarkers and AI classification models for neurodegenerative diseases.

As a technology innovator, he co-developed TRACE4AD™, the first CE-cleared AI-based risk prediction software for Alzheimer's dementia from MRI, and other CE-certified solutions for cancer screening. He holds a Ph.D. in Physics and previously conducted research at the Italian National Research Council (IBFM-CNR). He serves as Associate Editor and reviewer for international journals, and his work has been recognized with awards including Forbes 30 Under 30 and national research prizes.

B. Positions and Honors

2022- Associate Professor of Applied Physics, Medical Imaging and Artificial Intelligence at the University School for Advance Studies IUSS Pavia, Italy; Head of the Artificial Intelligence Research Group at IUSS Pavia (Ailice Labs).

2018- CEO and Founder of DeepTrace Technologies, Milan (Italy)

2019-2022 Senior Researcher in Applied Physics, University School for Advance Studies IUSS Pavia, Italy

2019-2020 Adjunct Professor Adjunct Professor at the University of Milan-Bicocca, Milan (Italy)

2012-2019 Doctoral and post-doctoral research fellowship at the Institute of Bioimaging and Molecular Physiology, National Research Council (IBFM-CNR), Italy

Honors

- FORBES 30 UNDER 30 EUROPE Award, at European level, for Science and Health, the only Italian researcher among over 15,000 applications;
- Scientific Award of the Department of Biomedical Sciences of the National Research Council;
- "Youth in Action for Sustainable Development Goal" Award by the Italian Accenture Foundation, the Eni Enrico Mattei Foundation and the Giangiacomo Feltrinelli Foundation, received at the Chamber of Deputies, in the presence of the President of the Republic, Sergio Mattarella, the President of the Chamber of Deputies, Laura Boldrini, the President of the Conference of Rectors of Italian Universities, Gaetano Manfredi, the Minister of Labor and Social Policies, Enrico Giovannini, and other important authorities.
- Peres Heritage Initiative Award, received received from the Prime Minister, Paolo Gentiloni, at the European House - Ambrosetti (Villa d'Este, Cernobbio) during the gala dinner, on the occasion of the annual Forum "Intelligence of the world, Europe, Italy" (1-3 September 2017), an international that has brought together, since 1975, Heads of State and Government, top representatives of international institutions, Ministers, Nobel laureates, entrepreneurs, managers and experts to discuss issues impacting the global economy and society as a whole.
- Civic Merit Luit d'Oro City of Nova Milanese 2017, awarded by the City of Nova Milanese "for the prestigious national and international results in scientific research".
- Angelo Marai 2017 Award, by ASIS (Association of Health Industry Studies) and the Carlo Erba Foundation to a research doctor who during his doctoral period has carried out particularly innovative research and which can form the basis of programs future in the field of neurodegenerative diseases.
- "Progetto Diventerò" 2017-2018 Award, assigned by the Bracco Foundation and aimed at accompanying talented young people in their training and professional process.
- "Startup World Cup 2019" finalist (top-20 listmaker), December 2018, organised by StartupItalia! and Fenox Venture Capital.
- "Top-100 italian-startups" listmaker, December 2018, as selected by StartupItalia.
- "OpenItaly DemoDay" finalist, April 2019 (top-20 listmaker).
- Winner of the "LifeScience Unicredit StartLab", June 2019.
- "Marzotto Award" finalist, September 2019.

Patents

- *CASTIGLIONI, I., INTERLENGHI, M., POLIDORI, A., & SALVATORE, C. (2025). U.S. Patent No. 12,288,326. Washington, DC: U.S. Patent and Trademark Office.*

Reviewer Experience

Christian Salvatore has served as external referee for competitive international research grants since 2018, including for The Royal Society (London). He was a member of the Scientific Editorial Board of European Radiology Experimental (European Society of Radiology) from 2021 to 2023 and has acted since 2017 as Guest Associate Editor (by invitation) for Frontiers in Neuroscience (section Brain Imaging Methods), coordinating the special issue "Imaging Biomarkers for the Diagnosis and Prognosis of Neurodegenerative Diseases" published across multiple Frontiers journals. He regularly serves as peer reviewer for leading international journals, including Human Brain Mapping, Journal of Neuroscience Methods, Frontiers in Aging Neuroscience, Frontiers in Computational Neuroscience, NeuroImage: Clinical, and Scientific Reports (Nature Portfolio).

C. Contributions to Science

Christian Salvatore's research focuses on the development and clinical translation of artificial intelligence and machine learning methods for medical imaging and digital phenotyping, with a primary emphasis on neurodegenerative diseases, including Alzheimer's and Parkinson's disease. His work has contributed to the identification of quantitative MRI, radiomic, and language-based biomarkers for early diagnosis, differential diagnosis, staging, and prognosis. He has combined methodological innovation in machine learning (e.g., support vector machines, transfer learning, multimodal integration)

with rigorous validation on multicenter clinical cohorts. Salvatore has played a leading role in translating AI research into clinical practice through the development of CE-certified Software as a Medical Device, including TRACE4AD™ for dementia risk prediction and TRACE4OC™ for cancer screening. His recent work also extends to natural language processing for digital phenotyping, reinforcing a trustworthy, interpretable, and clinically actionable AI paradigm in healthcare.

Selected publications:

- Aresta S, Nemni R, Zanardo M, ... Salvatore C et al. AI-based staging, causal hypothesis and progression of subjects at risk of Alzheimer's disease: A multicenter study. *Frontiers in Neurology* (2025).
- Aresta S, Battista P, Palmirotta C, Tagliente S, ... Salvatore C. Digital phenotyping of Parkinson's disease via natural language processing. *npj Parkinson's Disease* 11:182 (2025).
- Battista P, Nemni R, Vitali P, ... Salvatore C et al. Alzheimer's dementia early diagnosis, characterization, prognosis and treatment decision via a Software-as-Medical Device with an AI agent. *Alzheimer's & Dementia* (2024).
- Castiglioni I, Rundo L, Codari M, ... Salvatore C et al. AI applications to medical images: From machine learning to deep learning. *Physica Medica* (2021).
- Castiglioni I, Ippolito D, Interlenghi M, ... Salvatore C Machine learning applied on chest x-ray can aid in the diagnosis of COVID-19. *European Radiology Experimental* (2021).
- Battista P, Salvatore C, Castiglioni I. Artificial intelligence and neuropsychological measures: The case of Alzheimer's disease. *Neuroscience & Biobehavioral Reviews* (2020).
- Nanni L, Interlenghi M, Brahnam S, Salvatore C, et al. Comparison of transfer learning and conventional machine learning applied to structural brain MRI for early diagnosis of Alzheimer's disease. *Frontiers in Neurology* (2020).
- Salvatore C, Cerasa A, Castiglioni I. MRI characterizes the progressive course of AD and predicts conversion to Alzheimer's dementia 24 months before probable diagnosis. *Frontiers in Aging Neuroscience* (2018).
- Battista P, Salvatore C, Castiglioni I. Optimizing neuropsychological assessments for cognitive, behavioral, and functional impairment classification: A machine learning study. *Behavioural Neurology* (2017).
- Nanni L, Salvatore C, Cerasa A, Castiglioni I, et al. Combining multiple approaches for the early diagnosis of Alzheimer's disease. *Pattern Recognition Letters* (2016).

D. Past and Ongoing Research Support

Christian Salvatore has coordinated and participated in numerous competitive research, innovation, and technology-transfer projects funded by national, regional, and European institutions, both in academic and industrial contexts.

He was Coordinator of the Brevetti+ 2021 project (2021–2023, financed in 2021), carried out by DeepTrace Technologies S.r.l. and funded by Invitalia – Agenzia nazionale per l'attrazione degli investimenti e lo sviluppo d'impresa, with a total grant of €77,041.54.

He participated as Collaborator in the Case delle Tecnologie Emergenti 2022 project (2023–2024, financed in 2022), carried out by DeepTrace Technologies S.r.l. and funded by the Ministero delle Imprese e del Made in Italy, with a total grant of €251,500.00 (<https://www.mimit.gov.it/it/incentivi/casa-delle-tecnologie-emergenti-nuovo-bando-2>).

He is Collaborator in the project Accordi per l'Innovazione – Secondo Sportello 2023 (2024–2027, financed in 2024), carried out by DeepTrace Technologies S.r.l. and funded by the Ministero delle Imprese e del Made in Italy, with a total grant of €100,406.25 (<https://www.mimit.gov.it/it/normativa/decreti-direttoriali/decreto-direttoriale-17-febbraio-2023-accordi-per-innovazione-secondo-sportello-graduatorie-definitive>).

He served as Coordinator of the case-study carried out by DeepTrace Technologies for the project FAIR – Future Artificial Intelligence Research, Spoke 4 “Adaptive AI”, Bando 2 (2024–2025, financed in 2024), funded within the PNRR framework and coordinated by Politecnico di Milano, with a total grant of €92,750.53

(https://www.polimi.it/fileadmin/user_upload/ricerca-scientifica/PNRR/bandi-a-cascata/FAIR/FAIR_Imprese/FAIR-Graduatoria.pdf).

He participated as Collaborator in the MIUR-funded project “Next Generation UPP: nuovi schemi collaborativi tra Università e uffici giudiziari per il miglioramento dell’efficienza e delle prestazioni della giustizia nell’Italia nord-ovest” (2022–2023), carried out by IUSS Pavia within the Governance e Capacità Istituzionale 2014–2020 programme.

During 2017–2019, at the Institute of Bioimaging and Molecular Physiology (IBFM-CNR), he was Coordinator of the project “Artificial intelligence applied to biomedical imaging for the identification of new biomarkers for the early diagnosis and prediction of neurological diseases”, funded by the Department of Biomedical Sciences of CNR (DSB-CNR; CDR/GAE 009.000.000/P0000249), with a grant of €10,000.

In the same period (2017–2019), he was Collaborator in the MIUR-funded project “Invecchiamento: innovazioni tecnologiche e molecolari per un miglioramento della salute dell’anziano e popolazioni isolate”, contributing to Work Packages 2.1 and 2.2 for a total allocated budget of €418,800, at IBFM-CNR.

From 2016 to 2019, he participated as Collaborator in the project MOBARTECH – Una piattaforma mobile tecnologica, interattiva e partecipata per lo studio, la conservazione e la valorizzazione di beni storico-artistici, funded by Regione Lombardia, with a total grant of €401,532, at IBFM-CNR.

In 2015, he was Collaborator in the projects Smart Care Giver and IMAPRINT, both funded by Regione Lombardia, each with a grant of €12,500, at IBFM-CNR.

Between 2013 and 2016, he participated as Collaborator in the project MbMM – Metodologie di base per l’innovazione nella diagnosi e nella terapia di malattie multifattoriali, funded by Regione Lombardia, with a total grant of €170,625, and in the project Care-G – Una piattaforma di servizi per la cura della salute e la qualità della vita degli anziani (2013–2015), funded by Regione Lombardia, with a total grant of €183,750.02, both carried out at IBFM-CNR.

Through DeepTrace Technologies, Christian Salvatore is Collaborator (subcontractor) in the European initiative EUCAIM – European Federation for Cancer Images, a flagship project under the Digital Europe Programme supporting federated cancer imaging infrastructures and AI development.

He is also involved as Partner and Steering Committee member in the European project BreastScan – Pan-European Breast Image Platform for Advanced AI-based Breast Cancer Screening, carried out within the Cancer Image Europe / EUCAIM ecosystem.

Additional research and innovation projects carried out through DeepTrace Technologies as partner and/or coordinator include: Brevetti+ (MISE, 2021), Calliope (MIMIT, 2023), NeuroSuite (MIMIT, 2023), FAIR (2024), Trace4MUSK (MIUR, 2024), COPAILOT (2024), and OMAI (2025).

E. Experience as a research supervisor

Christian has served as supervisor/advisor for >5 undergraduate or Master’s theses and as academic coordinator for 4 university internships, conducted at IUSS-Pavia, University of Milan–Bicocca, and at the 2nd-level University Master in Hadrontherapy (National Center for Oncological Hadrontherapy – CNAO and University of Pavia). He is a member of the PhD Faculty Board of the doctoral program Science and Technology for Advanced Therapies (STAT) at IUSS Pavia, which also includes the former “The Hadron Academy” PhD program, and currently supervises 3 PhD students.