Alessio Staffini

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Research Interests

Computational Economics, Machine Learning, Deep Learning

Education

Catholic University of Milan — Milan, Italy
Ph.D. in Economics — *2018 – 2022*

Thesis title: "Essays on Complex Economic Systems and Artificial Intelligence"

- "Effects of skills gap in the labor market: an Agent-Based Modeling approach"
- "A CNN-BiLSTM architecture for macroeconomic time series forecasting"
- "Stock Price Forecasting by a Deep Convolutional Generative Adversarial Network"

Supervisor: Domenico Delli Gatti

Catholic University of Milan — Milan, Italy
II level Master in Economics and Finance — *2017 – 2018*

Thesis title: "Testing causality: the effects of immigration on unemployment and per capita GDP"
Supervisor: Luca Colombo

Bocconi University — Milan, Italy
M.Sc. in Economics and Management of Public Administration and International Institutions — *2014 – 2016*

Thesis title: "Jobless Growth: analysis of the Canary Islands (Spain)"
Supervisor: Nicola Fabbri

Bocconi University — Milan, Italy
B.Sc. in Economics and Social Sciences — *2011 – 2014*

Thesis title: "Sustainable Tourism. Analysis of Fuerteventura (Canary Islands, Spain)"
Supervisor: Valeria Belvedere

Additional Education

Tokyo Institute of Technology (Tokyo Tech) — Tokyo, Japan
Visiting Student — *September 2019 – November 2019*, *December 2020 – February 2021*

I attended two graduate courses from the Department of Mathematical and Computing Science: "Mathematical Optimization: Theory and Algorithms" (final grade: A+) and "Stochastic Differential Equations" (final grade: A+).

Hitotsubashi University — Tokyo, Japan
Visiting Student (Exchange Program) — *October 2015 – March 2016*

Exchange student at the Graduate School of International and Public Policy. I mainly took courses in economic history, globalization, and international political economy.
Average Evaluation: A

Tsinghua University — Beijing, China
Visiting Student (Campus Abroad Program) — *July 2015 – August 2015*

I attended one graduate course from the Department of Social and Political Sciences: "Comparative Business History: Competition and Globalization" (final grade: A).

Awards and Scholarships

Ph.D. Scholarship — Catholic University of Milan
November 2018 – December 2022

JASSO Scholarship — Hitotsubashi University
October 2015 – March 2016

Work Experience

KPMG Advisory Lighthouse — Tokyo, Japan
Senior Data Scientist — *July 2023 – present*

Senior Data Scientist at the Advanced Analytics & AI Labs Division. I am mainly working on Natural Language Processing and Causal Inference. Responsibilities include:

- Coordinating small teams of data scientists, establishing objectives and timelines to align with the strategic requirements and goals of our clients and internal teams.
- Actively engaging in hands-on coding and development of models to address and fulfill stakeholder expectations.
- Regularly keeping up-to-date with the latest advancements in data science by reviewing research papers, attending industry conferences, and participating in professional workshops.
- Mentoring junior and mid-level data scientists, regularly performing code reviews and providing them guidance and feedback to ensure effective problem solving and compliance to best practices.
- Participating in the hiring process, conducting technical interviews and contributing to candidate evaluation and selection.

ALBERT Inc. — Tokyo, Japan
AI Research Scientist — *July 2022 – May 2023*

AI Research Scientist at the Advanced Technology Department, where I conducted research on Reinforcement Learning and Vision-and-Language Navigation. My tasks mainly involved:

- Reading, summarizing, implementing, and presenting research papers.
- Conducting research, producing publications, and presenting such results at national and international conferences.
- Monitoring project outcomes and supporting interns in the department.

Data Scientist — *April 2019 – June 2022*

Data Scientist at the Data Solutions Division. I took part in several projects, primarily in the financial and healthcare sector. My tasks mainly involved:

- Data collection, data cleansing, and data visualization.
- Identification of missing, invalid values and outliers, analysis and categorization of variables in big datasets.
- Pattern recognition and statistical modeling.
- Implementation of machine learning algorithms for classification and prediction.
- Reporting results and creating supporting documentation for the client.
- Teaching basic Python programming for data science to the new employees.

In particular:

- I set up a collaborative research project between The University of Tokyo and ALBERT Inc., which resulted in multiple publications in peer-reviewed international journals.
- I cooperated with the data science team of a Japanese multinational company to provide tailored solutions on a wide range of healthcare-related problems.
- I built a fast recommendation system for a major Japanese financial services group in order to provide daily suggestions on which stocks to buy to millions of users, according to their past activities. The proposed recommendation system improved the considered metrics (Precision and Recall) over the baseline models of more than 100%.

European Commission Luxembourg City, Luxembourg
Intern *April 2016 – August 2016*

Intern at the DG for Economic and Financial Affairs of the European Commission. My tasks mainly involved:

- Identifying, extracting, and collecting relevant information from the documents.
- Providing statistics, producing charts and tables to support the Directorate-General in its research studies.

Research Experience

Studio Strata Tokyo, Japan
Founder and Principal Researcher *June 2025 – present*

Independent laboratory focused on mathematical economics, computational economics, and theoretical ML. Dedicated to developing rigorous theoretical frameworks and contributing original research to the scientific community.

The University of Tokyo Tokyo, Japan
Visiting Researcher *September 2020 – present*

Visiting Researcher in the Laboratory of Clinical Biotechnology (Graduate School of Medicine) and in the Laboratory of Precision Health (Department of Bioengineering, Graduate School of Engineering).
Main research areas include computational epidemiology and AI applications in the healthcare sector.

Publications

Journal Papers

1. Staffini A., "Endogenous Agreement Geometry in Nash Bargaining over a Continuum of Issues", *Games*, 17(4):41, 2026. doi:10.3390/g17040041.
2. Staffini A., "Tropical Geometry for Robust Mechanism Design", *Communications in Economics and Mathematical Sciences*, 5:1–20, 2026. doi:10.50906/cems.2025.001.
3. Staffini A., Svensson T., Chung U.-I., Svensson A.K., "A Disentangled VAE-BiLSTM Model for Heart Rate Anomaly Detection", *Bioengineering*, 10(6):683, 2023. doi:10.3390/bioengineering10060683.
4. Staffini A., Fujita K., Svensson A.K., Chung U.-I., Svensson T., "Statistical Methods for Item Reduction in a Representative Lifestyle Questionnaire: Pilot Questionnaire Study", *Interactive Journal of Medical Research*, 11(1):e28692, 2022. doi:10.2196/28692.
5. Staffini A., "Stock Price Forecasting by a Deep Convolutional Generative Adversarial Network", *Frontiers in Artificial Intelligence*, 5:837596, 2022. doi:10.3389/frai.2022.837596.
6. Staffini A., Svensson T., Chung U.-I., Svensson A.K., "Heart Rate Modeling and Prediction Using Autoregressive Models and Deep Learning", *Sensors*, 22(1):34, 2022. doi:10.3390/s22010034.
7. Staffini A., Svensson A.K., Chung U.-I., Svensson T., "An Agent-Based Model of the Local Spread of SARS-CoV-2: Modeling Study", *JMIR Medical Informatics*, 9(4):e24192, 2021. doi:10.2196/24192.

Conference Papers

1. Karvonen T., Staffini A., Maeda K., Arudchelvan M., Ozawa T., Tokunaga N., Hirokawa N., "Domain-Specific Reranking: When is Adaptation Worth the Cost?", in *Proceedings of the 49th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR '26)*, pp. 4706–4710, ACM, 2026. doi:10.1145/3805712.3808400.

2. Staffini A., "Tokenization Cost, Retention, and Orthography Robustness for Ladin and Italian Varieties," in *Proceedings of the Second Workshop on Language Models for Low-Resource Languages (LoResLM @ EACL 2026)*, pp. 570–583, 2026. doi:10.18653/v1/2026.loreslm-1.49.

3. Staffini A., "A CNN-BiLSTM Architecture for Macroeconomic Time Series Forecasting", *Engineering Proceedings*, 39(1):33, 2023 (presented at the 9th International Conference on Time Series and Forecasting, ITISE 2023). doi:10.3390/engproc2023039033.

Service to the Profession

Journal Refereeing

Springer Nature: *BMC Infectious Diseases*, *BMC Medical Research Methodology*, *BMC Public Health*, *Discover Artificial Intelligence*, *Discover Public Health*, *Journal of Healthcare Informatics Research*, *Journal of King Saud University Computer and Information Sciences*, *Scientific Reports*, *The Journal of Supercomputing*

Elsevier: *Neurocomputing*, *Technological Forecasting and Social Change*

JMIR Publications: *JMIR AI*, *JMIR Aging*, *JMIR Bioinformatics and Biotechnology*, *JMIR Dermatology*, *JMIR Formative Research*, *JMIR Infodemiology*, *JMIR Medical Informatics*, *JMIR Public Health and Surveillance*, *JMIR Research Protocols*, *JMIRx Med*, *Journal of Medical Internet Research*

MDPI: *Actuators*, *AI*, *Algorithms*, *Applied Sciences*, *Big Data and Cognitive Computing*, *Brain Sciences*, *Computers*, *Data*, *Diabetology*, *Electronics*, *Entropy*, *Games*, *Healthcare*, *Information*, *Journal of Clinical Medicine*, *Journal of Marine Science and Engineering*, *Life*, *Machine Learning and Knowledge Extraction*, *Mathematics*, *Processes*, *Robotics*, *Sensors*, *Stats*, *Sustainability*, *Systems*, *Technologies*, *Tomography*

Taylor & Francis: *Behaviour and Information Technology*

John Wiley & Sons: *Statistics in Medicine*

Frontiers Media: *Frontiers in Applied Mathematics and Statistics*, *Frontiers in Cardiovascular Medicine*, *Frontiers in Psychology*

Other Publishers: *Intelligenza Artificiale* (IOS Press), *International Journal of Intelligent Computing and Cybernetics* (Emerald Group Publishing), *Journal of Medical Artificial Intelligence* (AIMS Press), *PeerJ Computer Science* (PeerJ), *Qeios* (Qeios)

Conference Refereeing

The International Conference on Electrical and Computer Engineering Researches (ICECER) 2026

Language Skills

- Italian: native
- English: fluent (IELTS 7.5)
- Spanish: proficient
- Japanese: business proficiency
- Finnish: basic

Computer Skills

- Programming languages: Python, R, MATLAB, NetLogo, Java, C/C++
- Machine learning and data science libraries: PyTorch, scikit-learn, NumPy, pandas, Hugging Face Transformers
- Cloud platforms: Microsoft Azure, Amazon Web Services (AWS)
- Data processing and query technologies: SQL, Spark, Hadoop
- Statistical software: SPSS, gretl, STATA
- Network analysis tools: Gephi, Pajek
- Development tools: Linux/Unix, Git, Docker
- Other tools: Microsoft Office, CloudCompare, AutoCAD

Other Interests

Art, Music (playing bass guitar), Photography, Travelling, Reading.