



ALESSANDRA STRAMIGLIO

PhD Student in Data Science and Computation

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SUMMARY

I am a Ph.D. student at the University of Bologna with a project co-funded by Automobili Lamborghini S.p.a. on the use of AI in the automotive industry focused on vehicle and customer data. I am currently following the XAI (Explainable Artificial Intelligence) strand of research. Previous to this I completed my studies in Artificial Intelligence at the University of Bologna, where I acquired a comprehensive understanding of machine learning and deep learning. In particular, my academic journey was enriched by my thesis conducted in France at a research center, where I delved into predicting human movement through the analysis of neural multivariate time series signals. My skills enable me to deal with a wide range of tasks and my adaptable and hard-working mindset allows me to thrive in dynamic and ever-changing environments.

EDUCATION

PHD IN DATA SCIENCE AND COMPUTATION

November 2023 - ongoing

PHD @ UNIVERSITY OF BOLOGNA

I am a PhD student at the University of Bologna with a project co-funded by Automobili Lamborghini S.p.a on the use of AI in the automotive domain focused on vehicle and customer data. I am currently following the research strand of XAI (Explainable Artificial Intelligence).

ARTIFICIAL INTELLIGENCE

September 2020 - March 2023

MASTER'S DEGREE IN ARTIFICIAL INTELLIGENCE @ UNIVERSITY OF BOLOGNA *FINAL EVALUATION: 109/110*

Specific courses as: Computer Vision, Machine Learning for Computer Vision, Deep Learning, AI in Industry, Natural Language Processing, Combinatorial decision-making and optimization.

I really enjoyed taking the courses offered by the master's program and pursuing group projects and evaluate areas where artificial intelligence could be applied. As a matter of fact, I chose to do my thesis abroad in a research center that applies machine learning techniques on medical data.

Dissertation Title: Predicting human movement from neural multivariate time series with ResNet

| Research Supervisors: Dr. Marine Vernet, Dr. Pauline Mouches | Academic Supervisor: Prof. Samuele Salti

My objective encompassed the creation of deep learning models aimed at addressing the challenge of identifying motor preparation within brain signals acquired through Magnetoencephalography (MEG), a neuroimaging method renowned for its exceptional temporal precision (<1ms). Successfully detecting such patterns could bear significant implications in the realm of neurology, particularly in enhancing the control of neuro prostheses. Additionally, this endeavor held potential interest within cognitive neuroscience, enabling investigations into action control and the concept of agency – the subjective sensation that attributes our voluntary actions, and consequently their outcomes in the world, to our own origination. Throughout my internship, I was mentored by: Pauline Mouches, a post-doctoral researcher expert in Deep Learning, and Marine Vernet, a CNRS researcher who holds expertise in Cognitive Neuroscience. This experience allowed me to become acquainted with the conventions and toolsets commonly employed in Cognitive Neuroscience analysis, notably the MNE Python framework. I took existing code designed for data preprocessing and tailored it to suit the project's needs. Subsequently, I implemented a deep neural network based on a ResNet architecture known for its proficiency with time series data. Engaging in weekly meetings, I shared my methodology and systematically assessed the viability of the outcomes achieved at each phase.

COMPUTER ENGINEERING

September 2016 - March 2020

BACHELOR'S DEGREE IN COMPUTER ENGINEERING @ UNIVERSITY OF BOLOGNA *FINAL EVALUATION: 93/110*

Specific courses as: C, Java, Operating Systems, Web Development, Logical Networks, Computer Networks, Telecommunications, Electronics..

I liked the course and it trained me in the main basics of engineering and programming languages. I then decided to do my thesis in the field of telecommunications.

Dissertation Title: Study of a variant of the CGR/SABR routing algorithm for resolving possible loops

| Supervisor: Carlo Caini

The purpose of this thesis was to analyze the CGR (Contact Graph Routing) algorithm implemented by NASA-JPL (National Aeronautics and Space Administration, Jet Propulsion Laboratory) in ION 3.7.0 (Interplanetary Overlay Network), believed to be the most important framework to implement the DTN (Delay-/Disruption-Tolerant Networking) architecture. This architecture allows communications in space where networks are subject to intermittent connections and long delays. The study focused mainly on the "ipnfw" thread that deals with packet forwarding and routing choices. Since in the standard version of ION there are no countermeasures, this thesis attempted to design and implement a possible countermeasure to occurring loops in ION. Modifications made to the original code were tested to verify its proper functioning.

DIPLOMA, SCIENTIFIC SPECIALIZATION

September 2011 - July 2016

DIPLOMA AT LICEO SCIENTIFICO A. RIGHI, CESENA (FC)

Final Evaluation: 93/100

WORK EXPERIENCE

RESEARCH - AUTOMOBILI LAMBORGHINI S.P.A.

2023 - ongoing

PHD PNRR

Research on AI application in automotive domain

RESEARCH - LYON NEUROSCIENCE RESEARCH CENTER

2022-2023 / France

ERASMUS+ TRAINEESHIP PROGRAM, 6 MONTHS

Research for master thesis project. Predictions on neural multivariate time series brain recordings.

TUTORING

2016-2022

PRIVATE LESSONS IN IT AND MATHEMATICS

Help and support for students from high school to university.

TECHNICAL TUTORING - UNIVERSITY OF BOLOGNA

2020-2021

UNIVERSITY JOB, 4+4 MONTHS

Supported professors with software and hardware needed for distance learning.

DESIGN AND PROGRAMMING - ALEXIDE SRL

2019

INTERNSHIP, 2 MONTHS

Research project on indoor positioning.

PAST PROJECTS

KEY-POINTS MATCHING IN NLP

2022

NATURAL LANGUAGE PROCESSING

Argument mining involves automatically identifying argument structures in free text, such as the argument's conclusion, premises, and reasoning scheme. One of the tasks that composes argument mining's pipeline is key-point matching: given a sentence (typically an argument) and a key-point, determine whether the latter matches the proposed sentence. In this scenario also the topic and the stance of the argument have been integrated to provide context to the models. We experimented both unsupervised and supervised methods. In particular, clustering with GloVe embedding, BERT vector representations and tf-idf have been endeavoured.

FLATLAND PROJECT

2021

REINFORCEMENT LEARNING

Flatland is a challenge organized by AICrowd in collaboration with the Swiss Federal Railways (SBB) aimed at managing dense traffic on complex railway networks in efficient way. The goal of the challenge is to plan the path of an arbitrary number of trains inside a rail environment by guiding them towards a target station with minimal travel time by minimizing the number of steps that it takes for each agent to reach its destination. We tackled the problem by starting with an Actor-Critic approach implementing a PPO network. Then we developed a DQN with the two improvements Double-DQN and Dueling-DQN.

COMBINATORIAL DECISION MAKING OPTIMIZATION

Very large-scale integration (VLSI) is the process of creating an integrated circuit by combining multiple circuits on a single chip. We designed the VLSI of the circuits minimizing the final length of the device. We have developed different solutions both in CP (Constraint Programming) and SMT solvers, which can reason natively at higher level of abstraction, while still retaining the speed and automation of boolean engines.

DIGITAL SKILLS

- Programming Languages:
Experienced: Python (2.7, 3.9) | Java | C | C++ | C# | Scala
Familiar: Javascript | SQL | Bash | Kotlin | Prolog | MiniZinc
- Complete management and use of the following OS: Windows | GNU/Linux | MacOSX
- Frameworks and libraries: Tensorflow | Pytorch | Matplotlib | Numpy | Pandas
 | Scikit-Learn | MNE-Tools | opencv | ...

LANGUAGE SKILLS

Italian (Native)

English - IELTS 2022

Listening	Reading	SpokenProduction	SpokenInteraction	Writing
C1	C2	C1	C1	B2

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

MANAGEMENT SKILLS

Working experience within both academic and commercial environments. Excellent relation and communication skills. Ability to manage teamwork.

HOBBIES AND INTERESTS

In my spare time I like to read and watch films. I dabble in cooking and in winter I like to go snow-boarding. I also like to keep my mind entertained by learning new things, currently I am studying French and Dutch.