



JOSEPH GIOVANELLI'S CV

Affiliation Alma Mater Studiorum - University of Bologna, Italy
Department of Computer Science and Engineering
Member of the Business Intelligence Group (BIG)
Address Via dell'Università, 50, Cesena (FC) 47522, Italy
Email j.giovanelli@unibo.it



CURRENT POSITIONS

Ph.D. Student in Computer Science and Engineering *November 2020 - January 2024*

Alma Mater Studiorum - University of Bologna, Italy

My research interests regard mostly the AutoML field: I've worked on supervised and unsupervised tasks, Data Pre-processing impact, warm-starting via Meta-learning, and recently I am particularly focus on explainability and Human-centered AutoML.

Member of the project Agro Big Data Science (ABDS) *November 2020 - January 2024*

Alma Mater Studiorum - University of Bologna, Italy

The project aims at improving the automation of the watering systems in Precision Farming. I have the opportunity to study, research, and devise solutions that suit the cases at hand.

Member of the Business Intelligence Group (BIG) *November 2020 - January 2024*

Alma Mater Studiorum - University of Bologna, Italy

The group studies techniques aimed at extracting value from data in the most diverse business contexts. I enhance the group with my AutoML knowledge; plus I am growing under the academia perspective, understanding how to conciliate research and company projects.

EDUCATION

Master's Degree in Computer Science and Engineering *October 2017 - March 2020*

Alma Mater Studiorum - University of Bologna, Italy

110/110 cum laude

The course of study was focused on providing a strong background in the Data Science field. I acquired a deep understanding of Data Mining algorithms, Big Data techniques, Business Intelligence & Data Warehouse design.

Bachelor's Degree in Computer Science and Engineering *October 2014 - March 2017*

Alma Mater Studiorum - University of Bologna, Italy

110/110 cum laude

The course aimed to offer a new educational opportunity: to study Computer Science in a more complete way, examining both the design/engineering and the mathematical/scientific aspects. I acquired the fundamentals of Computer Science, with a focus on Software Engineering and Business Intelligence.

TEACHING EXPERIENCES

Teacher in a Professional Degree *from February 2022*

Fondazione Istituto Tecnico Superiore Tecnologie Industrie Creative, Italy

I currently teaching the course of **NoSQL databases**, which includes the main theoretic concepts of NoSQL databases and some implementations such as Cassandra, Neo4j, and MongoDB.

Teaching Tutor in a Bachelor's Degree course *from October 2021*

Alma Mater Studiorum - University of Bologna, Italy

I currently support the teaching of the course **Software Engineering**, which includes the main theoretic concepts of software engineering and deepens the UML formalism.

WORK EXPERIENCES

Big Data Engineer

March 2020 - October 2020

Data Reply, Milan, Italy

I developed Data Platforms to improve customers efficacy, by leveraging Data Pre-processing and Post-processing techniques, Big Data architectures, and Machine Learning algorithms.

Full-stack Developer

January 2013 - June 2013

Sixtema Spa (Tinexta Group), Ancona, Italy

I have developed both back-ends and front-ends of companies that manage huge amount of data. In this first experience, I could better understand the reality of work, and the opportunity to grow in teamwork.

VISITING EXPERIENCES

Visiting Scholar

March 2023 - June 2023

Institute of Artificial Intelligence, Leibniz Universität Hannover, Germany

I addressed multi-objective optimization with a preference learning approach. The problem is relevant in several use-cases, such as ethics and green AutoML, and human-intervention is crucial to avoid harm at different levels.

Visiting Scholar

September 2019 - March 2020

Universitat Politècnica de Catalunya, Barcelona, Spain

I worked on enhancing AutoML tools by including a Meta Learning phase with the aim of favoring/proposing better Data Pre-processing pipelines. The collaboration results in two publications.

PATENTS

Method and system for soil-quantity monitoring

October 2023

Italian patent

We created a Big Data Smart-irrigation Platform to both monitor the crop field in its entirety and suggest watering schedules. It includes ingestion, integration, and discovery capabilities.

AWARDS

Best Paper Award

March 2021

DOLAP 2021 - Co-located with EDBT 2021, Nicosia, Cyprus

The paper *Effective data pre-processing for AutoML* was selected as the *Best Paper* of the conference.

Certificate of merit

June 2017

Alma Mater Studiorum - University of Bologna

I was selected as one of the top 50 students in the Computer Science and Engineering department.

PUBLICATIONS

AutoML in the Age of Large Language Models: Current Challenges, Future Opportunities and Risks

June 2023

A. Tornede, D. Deng, T. Eimer, J. Giovanelli, A., T. Ruhkopf, S. Segel, D. Theodorakopoulos, T. Tornede, H. Wachsmuth, M. Lindauer

Transactions on Machine Learning Research (TMLR)

We envision that Natural Language Processing and Automated Machine Learning can radically push the boundaries of each other through tight integration. To showcase this vision, we explore the potential of a symbiotic relationship between AutoML and Large Language Models, shedding light on how they can benefit each other.

Smart irrigation system for precision water management: effect on yield and fruit quality of yellow fleshed kiwifruit in northern Italy *July 2023*

E. Baldi, M. Quartieri, G.N. Larocca, M. Golfarelli, M. Francia, J. Giovanelli, E. Xylogiannis, and M. Toselli

Precision agriculture'23

The study aimed at evaluating the effect of the type of irrigation system and amount of water supplied on vine yield and kiwifruit quality at harvest and after cold storage.

HAMLET: A framework for Human-centered AutoML via Structured Argumentation

Francia M., Giovanelli J., Pisano P.

January 2023

Future Generation Computer Systems, Elsevier

We propose HAMLET, a Human-centered AutoML framework that allows to: (i) inject knowledge and constraints through a intuitive logical language into a Logical Knowledge Base (LogicalKB), (ii) represent (user) inputs and (AutoML) outputs in a uniform medium that is both human- and machine-readable (Problem Graph) and discover insights atop the AutoML output.

Towards Human-centric AutoML via Logic and Argumentation

March 2022

Giovanelli J., Pisano P.

DATAPLAT 2022 - Co-located with EDBT 2022, Edinburgh, UK

We propose a framework that helps the Data Scientist to redeem her centrality in the Machine Learning process. Logic is leveraged to structure the knowledge, Argumentation to deal with inconsistencies.

Multi-Sensor Profiling for Precision Soil-Moisture Monitoring

May 2022

Francia M., Giovanelli J., Golfarelli M.

Computers and Electronics in Agriculture, Elsevier

We propose PLUTO, an original approach that builds fine-grained 2D and 3D soil moisture profiles by relying on a grid of sensors. PLUTO largely overcome the accuracy of traditional sensor layouts.

Data pre-processing pipeline generation for AutoETL

December 2021

Giovanelli J., Bilalli B., Abellò A.

Information Systems, Elsevier

We study the impact of transformations in general, and the impact of transformations when combined together into pipelines. We leverage Meta-learning to discover (i) rules that define the order of transformations, and (ii) rules that guide the instantiation of the transformations.

Effective data pre-processing for AutoML

March 2021

Giovanelli J., Bilalli B., Abellò A.

DOLAP 2021 - Co-located with EDBT 2021, Nicosia, Cyprus

We develop a generic method that allows to find effective data pre-processing pipelines. Our approach has been evaluated using Scikit-learn, providing results that get 90% of the optimal predictive accuracy in the median, but with a cost that is 24 times smaller.

VOLUNTEERING

Team Leader

March 2018 and March 2019

Kids Ark International, San Pedro Sula, Honduras

I got the opportunity to see different realities from everyday life, and to help the neediest people.

ASSOCIATIONS

Amateur Astronomers Association

September 2014 - September 2019

Ancona, Marche, Italy

I got to meet other astronomy enthusiasts, enrich my curiosity, and witness numerous phenomena.