

## PERSONAL INFORMATION

Family name, First name: Eftimov Tome

URL for website: <http://cs.ijs.si/eftimov>

Google Scholar: 3463 citations, h-index 31

Publications: over 156 publications (from which 59 journal articles), one Springer book, 4 chapters in books, and other publications



## EDUCATION

He received his Ph.D. in Information and Communication Technologies in 2018 at the International Postgraduate School Jožef Stefan. In 2019 - 2020, he was a postdoctoral research fellow at the Department of Biomedical Data Science at Stanford University, USA, and a research fellow at the University of California, San Francisco, USA.

## CURRENT POSITIONS

He is a senior researcher at the Computer Systems Department, Jožef Stefan Institute, Slovenia, and an assistant professor at the Faculty of Computer and Information Sciences, University of Ljubljana, Slovenia.

## AWARDS

In 2018, he was selected as the best young scientist in North Macedonia (under 30 years). In 2019, he was a co-author of a paper that won the best poster award at the AI for Social Good workshop at ICLR 2019. In 2020, he was leading a team that was first ranked at the Open Optimisation Competition at GECCO 2020 and PPSN2020, organized by Sorbonne University and the Facebook AI research group, in Paris, France. In 2021, he was co-author of a paper that won the best paper award at the EvoApps 2021 conference.

## SUPERVISION OF GRADUATE STUDENTS

He co-supervised three Ph.D. theses, supervised two completed master's theses, and co-supervised three master's theses. Currently, he is supervising two Ph.D. students and co-supervising one master's student.

## TEACHING ACTIVITIES

From 2011-2012, he was a teaching assistant (probability and statistics, linear algebra, calculus, discrete math) at the Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University - Skopje. Since 2020, he has been a teaching assistant at the Faculty of Computer and Information Sciences, University of Ljubljana, Slovenia. Currently, he is teaching (as an assistant professor) a course on Artificial Intelligence in master studies at the University of Ljubljana, School of Economics and Business.

## ORGANISATION OF SCIENTIFIC EVENTS

One of the main organizers of the following workshops: Program Chair at the 10th International Conference on Bioinspired Optimization Methods and Their Applications (BIOMA 2022), Special Session on Automated Algorithm Design for Evolutionary Computation (IEEE WCCI 2022, IEEE CEC 2023), Workshop on Representation Learning meets Meta-heuristics (IEEE CEC 2021), Workshop on Good Benchmarking Practices for Evolutionary Computation at the Genetic and Evolutionary Computation Conference (GECCO 2020, 2021, and 2022, IEEE CEC 2021), as well as at the 16th International Conference on Parallel Problem solving from Nature (PPSN 2020), Special session on Benchmarking of Evolutionary Algorithms for Discrete Optimization (BEADO 2020) at the IEEE WCCI 2020, Understanding Evolutionary Optimization Behavior (UEOB 2019) at the IEEE CEC 2019.

## IMPACT

In recent years, he has co-presented several tutorials on comparative statistical analysis at renowned international conferences and co-organized several special sessions that took place at international conferences (GECCO, PPSN, SSCI, IEEE CEC). He also co-authored a Springer book entitled "Deep Statistical Comparison for Meta-heuristic Stochastic Optimization Algorithms".

## CURRENT ACTIVITIES

His research interests include statistical data analysis, metaheuristics, natural language processing, representation learning, and explainable machine learning. He organizes several workshops and tutorials related to AI at high-ranked international conferences. He led an ARRS ERC StG complementary scheme (2022-2024). He was also a Scientific Coordinator of a European Food Safety Authority (EFSA)-funded project (2021-2022) related to AI information extraction from textual data and task leader of several H2020 projects. In 2024, he was awarded the HE ERA Chair AutoLearn-SI project. In recent years, he has also focused on educating young researchers, which is reflected in a greater number of publications in co-authorship with doctoral students, and the acquisition of national and EU projects.

## **PERSONAL INFORMATION**

Family name, First name: Tuba Eva

Google Scholar: 4409 citations, h-index 39



## **EDUCATION**

She received her Ph.D. in Computer Science from the Faculty of Informatics and Computing at Singidunum University in Belgrade, Serbia, in 2019. Before this, she earned two Master of Science degrees: one from the Faculty of Mathematics at the University of Belgrade, Serbia, in 2018, and another from the Graduate School of Computer Science at John Naisbitt University in Belgrade, Serbia, in 2016. She initially graduated with a Bachelor of Science from the Faculty of Mathematics at the University of Belgrade, Serbia, in 2015.

## **CURRENT POSITIONS**

She is a senior researcher at the Computer Systems Department, Jožef Stefan Institute, Slovenia, and an assistant professor at Trinity University, San Antonio, TX, USA.

## **AWARDS**

She has been listed among Stanford University's top 2% of most-influential scientists worldwide across all disciplines for her contributions to artificial intelligence for five consecutive years (2020–2025). She received the 2024 ACM-W Rising Star Award, which recognizes a woman whose early-career research has had a significant impact on the computing discipline.

## **SUPERVISION OF GRADUATE STUDENTS**

She was also a co-supervisor of master's and Ph.D. students at the State University of Novi Pazar and at Singidunum University in Serbia. Currently, she will supervise three PhD students and two postdocs as part of the HE ERA Chair AutoLearn-SI.

## **TEACHING ACTIVITIES**

She began her teaching career as a Teaching Assistant at John Naisbitt University in Belgrade from 2016 to 2018, where she led tutorials and labs in Introduction to Programming, Data Structures and Algorithms, Computer Graphics, Analytic Geometry, Discrete Mathematics, Mathematical Analysis, and Probability. From 2018 to 2019, she served as a Teaching Assistant at Singidunum University in Belgrade, supporting courses in Discrete Mathematics, Calculus, Object-Oriented Programming, Programming Languages, and Quantitative Methods. She was then appointed Assistant Professor at the Faculty of Informatics and Computing, Singidunum University (2019–2022), teaching Discrete Mathematics, Calculus, Object-Oriented Programming (Java, C++), and Quantitative Methods. In 2022–2023, she joined Trinity University in San Antonio, Texas as a Visiting Assistant Professor in the Department of Computer Science, where she taught Principles of Computer Science 1, Artificial Intelligence, Digital Image Processing and Classification, and Optimization Problems in Artificial Intelligence. She is currently an Assistant Professor in that same department (2023–present), where she offers courses in Principles of Computer Science 1, Big Data and Machine Learning, and Digital Image Processing and Classification.

## **CURRENT ACTIVITIES**

Her research interests include machine learning and artificial intelligence, image processing, and nature-inspired optimization algorithms (including swarm intelligence and multiobjective optimization). In 2024, she was awarded and served as an ERA Chair Holder for the HE ERA Chair AutoLearn-SI project.

## PERSONAL INFORMATION

Family name, First name: Gjorgjevikj Ana

URL for website: <https://scholar.google.com/citations?user=mEqk6ZUAAAAJ>

Google Scholar: 650 citations, h-index 6



## EDUCATION

She received a BSc degree in Informatics and Computer Engineering from the Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje, North Macedonia and an MSc degree in Computer Networks and E-Technologies from the Faculty of Computer Science and Engineering at the same university in 2010 and 2014, respectively. She received a PhD degree in Computer Science and Engineering from the Faculty of Computer Science and Engineering, Ss. Cyril and Methodius University, Skopje, North Macedonia in 2023.

## CURRENT POSITIONS

She is a postdoctoral researcher at the Computer Systems Department, Jožef Stefan Institute, Slovenia, since 1st April 2024. From 1st June 2025, her position will be funded by Horizon Europe (HE) Marie Skłodowska-Curie Actions (MSCA) Postdoctoral Fellowship.

## PROFESSIONAL EXPERIENCE

She has been employed as a software engineer in an international software development company, Lazarov Consulting Engineering, located in Skopje, North Macedonia, for 12 years, since completing her BSc studies. During her career in industry, she had the chance to work on software development and maintenance projects for a variety of clients, acquiring strong software engineering and project management skills. Her tasks included full-stack software development, database design and administration, system maintenance (solving critical IT problems that affect large number of users and require quick decision making), project management (communication with clients and nontechnical users, project planning, task delegation, progress monitoring and reporting), team leading and mentoring employees, delivering technical presentations to technical and nontechnical audiences. She pursued the MSc and a PhD degree in parallel with her full-time job.

## AWARDS

HE MSCA Postdoctoral Fellowship for the project “AutoLLMSelect: Framework for Robust and Explainable Automated Large Language Model Selection” with duration of two years, 1st June 2025 – 31st May 2027.

## SUPERVISION OF GRADUATE STUDENTS

From October 2025 she will be supervising one master's student at the Jožef Stefan International Postgraduate School, Information and Communication Technologies program.

## TEACHING ACTIVITIES

In the fall semester 2024-2025, she participated in the mandatory course Contemporary ICT Approaches at the Jožef Stefan International Postgraduate School, by delivering a lecture on Software Engineering Methods. In 2010, she was a laboratory assistant in the courses System Software and System Reliability at the Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University - Skopje.

## ORGANISATION AND REVIEWING ACTIVITIES

One of the organizers of a panel on Automated Machine Learning at the 22nd International Conference on Informatics and Information Technologies (CIIT) 2025. Reviewer at the European Conference on Artificial Intelligence (ECAI) 2024, the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD) 2025, and BEComLLM Workshop at IEEE Conference on Artificial Intelligence (CAI) 2025.

## CURRENT ACTIVITIES AND IMPACT

Her research interests include machine learning, deep learning, representation learning, multi-task learning, natural language processing, and their application to the fields of sustainable development, food and nutrition. As a postdoctoral researcher at Jožef Stefan Institute, she has been involved in 2 EU-funded projects from the HE Program. Through the MSCA Postdoctoral Fellowship, she aspires to continue her future research in two highly impactful research directions for society, i.e., (1) robust, transparent, and unbiased large language model benchmarking and (2) transparent and responsible use of machine learning and natural language processing in promoting and achieving sustainable development. By transitioning from a more than a decade-long industry career to an academic career, she also aspires to put her industry experience and practical skills at the service of educating students and advancing her fields of research interest.

## Description of the research group

The research group AutoLearn-SI is a part of the Computer Systems Department (CSD) at Jožef Stefan Institute (JSI), Ljubljana, Slovenia. The JSI is the largest and leading Slovenian research organization. The staff of around 960 specializes in a broad spectrum of basic and applied research in physics, chemistry, biochemistry and materials, electronics and information science, nuclear technology, energy utilization, and environmental science. The JSI in-house research has been reinforced by building strong links to universities, other research institutions, and industry.

The CSD specializes in metaheuristic optimization, meta-learning, statistical data analysis, machine learning, and natural language processing. Its research has applications in mobility, transportation, energy, manufacturing, bioinformatics, and healthcare. The CSD has participated in numerous European initiatives—Horizon Europe, PRIMA, EFSA, and others - as well as many national projects. Currently, our research group has been awarded an HE ERA Chair project (~2.5 million EUR), AutoLearn-SI, for establishing a new research group. It has also undertaken four bilateral collaborations: with Sorbonne University (Paris, France), Leibniz Universität Hannover (Germany), the Faculty of Natural Sciences and Mathematics at the University of Banja Luka (Bosnia and Herzegovina), and Harvard University (USA). Moreover, its work is closely aligned with Slovenia's Strategic Research and Innovation Partnerships.

The current research team consists of an Asst. Prof. Dr. Tome Eftimov (TE), Asst. Prof. Dr. Eva Tuba (ET), Prof. Dr. Barbara Koroušič Seljak (BKS), MCSA-PF-funded postdoctoral researcher Dr. Ana Gjorgjevikj (AG) (HE MSCA-PF AutoLLMSelect), MSCA Cofund postdoctoral researcher Dr. Gianpaolo Toree (GT) (HE MSCA SQUASH), postdoctoral researcher Dr. Gjorgjina Cenikj (GC), Ph.D. students Ana Nikolikj (AN), Sara Gjorgjeva (SG), Ibrahim Kridi (IK), and Maryam Gholami Shiri (MGS), and two master students, Jan Drole (JD) and Denica Kjorvezir (DK). The group has competencies in benchmarking, explainable machine learning, transfer learning, natural language processing, continual learning, and optimization. In June 2026, two postdoctoral students will join the research group as part of AutoLearn-SI.

# Description of the work to be carried out by the student

**Project title:** Smart-sized Benchmarking for Bio-Inspired Optimization Algorithms

**Supervised by:** Tome Eftimov, Eva Tuba, Ana Gjorgejvikj

Nowadays, artificial intelligence (AI)—including machine learning (ML), deep learning (DL), and optimization—is widely used to extract knowledge from data and support decision-making. However, a major challenge remains in generalizing AI knowledge from controlled experimental settings to real-world applications. This issue is further amplified by biases in data quality and distribution, as well as the increasing use of large models such as large language models (LLMs).

These challenges are particularly relevant in the context of **bio-inspired optimization algorithms** (e.g., evolutionary algorithms, swarm intelligence methods), which are a central focus of this project. Such algorithms are typically evaluated through extensive benchmarking across diverse problem landscapes, where their performance is highly sensitive to the choice and representativeness of benchmark problems. As a result, ensuring fair, efficient, and generalizable benchmarking is essential for advancing bio-inspired AI methods.

A classical comparative experimental study in AI proceeds in three phases: (i) defining a representative set of problems, algorithms, and evaluation metrics; (ii) executing large-scale experiments across all combinations; and (iii) analyzing results to identify the best-performing algorithms and configurations. In the case of bio-inspired optimization, this process often requires thousands of runs due to the stochastic nature of the algorithms, leading to high computational cost and challenges in reproducibility and generalization.

The primary objective of this project is to improve the **trustworthiness and efficiency of benchmarking for bio-inspired optimization algorithms** by developing a smart-sized benchmarking framework. The framework will:

- (i) represent optimization problems using meta-features that capture landscape characteristics,
- (ii) select small but representative subsets of benchmark problems to reduce experimental cost while preserving diversity, and
- (iii) define quantitative indicators to estimate how well algorithm's performance generalizes to unseen problems.

By focusing on bio-inspired optimization algorithms, this project directly contributes to the development of more reliable and interpretable evaluation methodologies within bio-inspired AI. The proposed approach will be validated on single-objective continuous optimization benchmarks, with extensions to related learning tasks where appropriate.

## Other relevant information

Location information: The Jožef Stefan Institute (<https://ijs.si/ijsw>) is the leading Slovenian scientific research institute, covering a broad spectrum of basic and applied research. It has facilities in two locations. The main facilities and the headquarters are on Jamova cesta 39, Ljubljana, and the other location is the Institute's Reactor Center Podgorica located in Dol near Ljubljana. The candidate will work at the leading facilities in Ljubljana (Jamova cesta 39, Ljubljana, Slovenia), 1.8km from the city center (20 minutes walking). Ljubljana is the capital and largest city of Slovenia. It is the country's cultural, educational, economic, political, and administrative center. It is one of the smallest European capitals, but also one of the greenest and most livable. It has a vibrant and diverse cultural scene, with many festivals, museums, galleries, theaters, and other attractions. Some of the landmarks of Ljubljana include the Dragon Bridge, the Triple Bridge, the Ljubljana Castle, the Central Market, and the Tivoli Park. Ljubljana is also a great base for exploring the rest of Slovenia, as it is located at the intersection of major European transportation routes. Furthermore, we will assist the student in finding suitable housing and provide extra financial funding to offset the cost of student dormitories for PhD candidates in Ljubljana.