Alexandros Tzanetos Ph.D.

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Education

Dpt. of Financial and Management Engineering, University of the Aegean — Chios, Greece
Ph.D. in Artificial Intelligence — 2014 - 2020

Dpt. of Financial and Management Engineering, University of the Aegean — Chios, Greece
Engineering Diploma in Financial and Management Engineering — 2008 - 2013

Academic Experience

Associated Professor	**Université de Sherbrooke**, Québec, Canada	2025.03 - to-date
Assistant Professor	**Jönköping University**, Jönköping, Sweden	2023.09 - to-date
Post-Doctoral Fellow	**Université de Sherbrooke**, Québec, Canada	2021.10 - 2023.08
Adjunct Professor	**University of the Aegean**, Chios, Greece	2020.10 - 2021.06
Teaching Assistant	**University of the Aegean**, Chios, Greece	2019.02 - 2020.06
PhD Candidate	**University of the Aegean**, Chios, Greece	2014.03 - 2020.03

Selected Publications

1. Öz, D., Altuntaş, T., **Tzanetos, A.** Interpretable metrics to get insight into algorithm search dynamics. *2026 IEEE Congress on Evolutionary Computation*, 2026
2. Ibehej, D., **Tzanetos, A.**, Juříček, M., Kůdela, J. An Investigation of Inherent Structural Bias in Established Benchmark Sets. *Proceedings of the Genetic and Evolutionary Computation Conference Companion*, 2025.
3. **Tzanetos, A.**, Kůdela, J. Working on the Structural Components of Evolutionary Approaches. *16th International Joint Conference on Computational Intelligence*, 2024.
4. Thymianis, M., **Tzanetos, A.** Is integration of mechanisms a way to enhance a nature-inspired algorithm?. *Natural Computing*, 2024.
5. **Tzanetos, A.** Does the Field of Nature-Inspired Computing Contribute to Achieving Lifelike Features?. *Artificial Life*, 2023.
6. **Tzanetos, A.**, Dounias, G. Nature inspired optimization algorithms or simply variations of metaheuristics?. *Artificial Intelligence Review*, 2021.

Grants

A streamlined environmental permitting process for construction projects related to critical infrastructure (SMARTE)
FORMAS, Innovation project, Strategic innovation programs — 2025 - 2028

Intelligent e-cargo bike-oriented deliveries
IT34379, Mitacs, Accelerate Program — (wrote the grant proposal)

Academic Citizenship

Section Editor: *Data in Brief, Elsevier* (2022 – 2025)
Editorial Board Member: *Data in Brief, Elsevier* (2020 – 2025)
Member:

Swedish Artificial Intelligence Society (SAIS)	since 2024
Swedish Operations Analysis Association (SOAF)	since 2023
Canadian Operational Research Society (CORS)	since 2023
SIGEVO, ACM	since 2021
Institute of Electrical and Electronics Engineers (IEEE)	since 2021
EU/ME, the EURO Working Group on Metaheuristics	since 2021
Technical Chamber of Greece	since 2019
Hellenic Artificial Intelligence Society	since 2017

SPECIES Scholarships 2026

Prospective advisor: **Alexandros Tzanetos**
Host institution: **Jönköping University**

Description of the research group

Dr. Tzanetos' research group is affiliated with the Jönköping AI Lab (JAIL) at Jönköping University, Jönköping, Sweden. Within JAIL, Dr. Tzanetos is leading the research on Evolutionary Computation (EC) and its applications to real-world problems. He is also affiliated with Université de Sherbrooke, Sherbrooke, QC, Canada, where he co-supervises graduate students and PhD candidates.

Description of the work to be carried out by the student

Context. Randomised Optimisation Algorithmss (ROAs), such as EC-oriented methods and Swarm Intelligence (SI) approaches, comprise a high-level, problem-independent algorithmic framework with configurable components that can be modified to tune the algorithm's search behavior. Properly selecting algorithmic components, such as initialization procedures, operators, and mechanisms, is crucial in designing ROAs.

Research on the selection of algorithm components focuses on the automated design of established paradigms [2] while neglecting the potential of integrating components from non-established approaches [6]. As recently noted, some novel ROA implementations can arise from combining components from other algorithms that are not yet integrated into a single algorithm [3]. Identifying such underexplored algorithmic components and illuminating their contributions to ROAs' performance and behavior enables automatic algorithm design methods to construct high-performance ROA implementations tailored to the problem or to known algorithmic defects.

Algorithmic components. Different types of algorithmic components exist in the various ROAs. Research introduces new versions of, e.g., evolutionary operators, to address different problems or improve ROAs' capabilities [4, 5], thereby increasing the number of potential operators. Due to the lack of a systematic overview of existing operators, researchers may overlook operators useful for their case, i.e., the application under study or the studied algorithm. Also, some ROAs contain promising mechanisms that can be used to overcome their known limitations [6, 8].

However, it remains unclear how to identify such promising mechanisms. For example, the usage of metaphorical language in recent ROAs does not fully enable researchers to comprehend a method's mathematical background [1] and, therefore, properly analyze their mechanisms.

Unified models. A recent idea is to describe ROAs in terms of their structural components, devising unified models. Unified models enable us to determine the similarities among ROAs and, therefore, to easily locate any unique components. For example, several ROAs can be expressed as a *Swarm Model* algorithm consisting of the structural components of Particle Swarm Optimization [7]. However, the various ROA structures substantiate that not all ROAs can be expressed as a Swarm Model algorithm. Therefore, it is necessary to introduce other unified models based on established ROAs, such as Ant Colony Optimization, Genetic Algorithm, and Variable Neighborhood Search.

Work to be carried out. In this project, the student will perform a comprehensive systematic overview of existing evolutionary approaches to identify those with unique algorithmic components. Specifically, they will focus on pinpointing recurring terms [7] and common components among Genetic Algorithms (GAs), Evolutionary Algorithms (EAs), and Evolution Strategies (ES) to construct a unified model that describes EC-oriented algorithms in terms of their structural components.

Then, they will use existing modular frameworks to create various configurations of the unified model algorithm they developed and collect empirical evidence on how the identified components affect the algorithm's performance and behavior.

Other relevant information

Jönköping University (JU) is an international university located in the heart of Sweden, renowned for its student entrepreneurship, strong research, and successful collaborations. It is located in Jönköping [/ˈjɜːn(t)ʃɜːpɪŋ/], which is approximately a two-hour drive from Gothenburg. Several bus options are available to commute easily to and from Landvetter Airport in Gothenburg, Sweden.

The School of Engineering, home to the Jönköping AI Lab (JAIL), offers a pleasant view of Lake Vättern.

If you want to take a look at the campus, feel free to take a virtual tour of JU.

Some housing options exist. Moreover, the host institution and the prospective advisor are committed to assisting the student with the accommodation.

References

[1] Claus Aranha, Christian L Camacho Villalón, Felipe Campelo, Marco Dorigo, Rubén Ruiz, Marc Sevaux, Kenneth Sörensen, and Thomas Stützle. Metaphor-based metaheuristics, a call for action: the elephant in the room. *Swarm Intelligence*, 16(1):1–6, 2022.

[2] Christian L Camacho-Villalón, Thomas Stützle, and Marco Dorigo. Designing new metaheuristics: manual versus automatic approaches. *Intelligent Computing*, 2:0048, 2023.

[3] Jesica de Armas, Eduardo Lalla-Ruiz, Surafel Luleseged Tilahun, and Stefan Voß. Similarity in metaheuristics: a gentle step towards a comparison methodology. *Natural Computing*, 21(2):265–287, 2022.

[4] Hamdi Tolga Kahraman, Sefa Aras, and Eyüp Gedikli. Fitness-distance balance (fdb): A new selection method for meta-heuristic search algorithms. *Knowledge-Based Systems*, 190:105169, 2020.

[5] Bernardo Morales-Castaneda, Oscar Maciel-Castillo, Mario A Navarro, Itzel Aranguren, Arturo Valdivia, Alfonso Ramos-Michel, Diego Oliva, and Salvador Hinojosa. Handling stagnation through diversity analysis: A new set of operators for evolutionary algorithms. In *2022 IEEE Congress on Evolutionary Computation (CEC)*, pages 1–7. IEEE, 2022.

[6] Marios Thymianis and Alexandros Tzanetos. Is integration of mechanisms a way to enhance a nature-inspired algorithm? *Natural Computing*, 23(3):567–587, 2024.

[7] Alexandros Tzanetos. Does the Field of Nature-Inspired Computing Contribute to Achieving Lifelike Features? *Artificial Life*, 29(4):487–511, 2023.

[8] Alexandros Tzanetos and Jakub Kudela. Working on the structural components of evolutionary approaches. In *IJCCI*, pages 375–382, 2024.