

University of Applied Sciences Upper Austria

HEAL Research Group

Stefan Wagner

Short CV

Stefan Wagner

Stefan Wagner is professor for complex software systems at the Software Engineering Department located at the [University of Applied Sciences Upper Austria](#), Hagenberg Campus. In the last 15 years Dr. Wagner conducted research on the theory and application of evolutionary algorithms and metaheuristic optimization in general. He is the deputy head and co-founder of the [Heuristic and Evolutionary Algorithms Laboratory \(HEAL\)](#) research group and worked as project manager and key researcher in several R&D projects on production and logistics optimization with numerous scientific and industrial partners. He is also the head architect and project manager of the open source optimization environment [HeuristicLab](#), which is used by researchers and practitioners all over the world. His research interests reside in the area of combinatorial optimization, evolutionary algorithms, computational intelligence, and parallel and distributed computing.

Dr. Wagner received his MSc in computer science in 2004 and his PhD in technical sciences in 2009, both from the Johannes Kepler University Linz, Austria. From 2005 to 2009 he worked as assistant professor for software project engineering and since 2009 as professor for complex software systems at the Software Engineering Department of the University of Applied Sciences Upper Austria. From 2011 to 2018 he was also CEO of the FH OÖ IT GmbH, which is the IT service provider of the University of Applied Sciences Upper Austria and was a member of the university's executive board. Since 2019 he is the head of the [Josef Ressel Center for Adaptive Optimization in Dynamic Environments](#).

Dr. Wagner has (co-)authored more than 150 publications on the theory and applications of heuristic optimization and evolutionary algorithms. He serves as reviewer for several journals and conferences and organizes the annual workshop on Evolutionary Computation Software Systems (EvoSoft) at the Genetic and Evolutionary Computation Conference (GECCO) since 2012.

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Research Group

Heuristic and Evolutionary Algorithms Laboratory (HEAL)

The [Heuristic and Evolutionary Algorithms Laboratory \(HEAL\)](#) is the largest research group of the [School of Informatics, Communications, and Media](#) of the [University of Applied Sciences Upper Austria](#). It is located at the Hagenberg Campus of the University and is embedded within the [Softwarepark Hagenberg](#).

Founded in the year 2000, HEAL encompasses 5 professors and 20 research associates today and conducts numerous applied research projects in the areas of heuristic and evolutionary optimization, prescriptive analytics, logistics and production optimization, and machine learning.

HEAL strives to promote scientific research in the field of metaheuristics for solving business and engineering optimization problems. Combinatorial optimization, consisting of typical supply chain and operations management problems such as scheduling or routing, and data analysis, including machine learning and interpretable prediction, are the two main areas of research. HEAL is committed to the pursuit for excellence in teaching, science, and software development and encourages a close cooperation between scientists and experts in different application domains.

Recently, HEAL also hosts two of the prestigious Josef Ressel Centers, the Josef Ressel Center for Symbolic Regression ([JRC SymReg](#)) and the Josef Ressel Center for Adaptive Optimization in Dynamic Environments ([JRC adaptOp](#)).

HEAL also develops and maintains [HeuristicLab](#), an open source software system for heuristic and evolutionary algorithms.

Homepage: <https://heal.heuristiclab.com>

Research Project

Josef Ressel Center for

Adaptive Optimization in Dynamic Environments

The Josef Ressel Centre for Adaptive Optimization in Dynamic Environments (JRC adaptOp) researches on optimization algorithms for controlling dynamic production and logistics processes in steel and glass manufacturing. These open-ended optimization methods run online and synchronized with the real world and can continuously observe change events, adapt over time and react proactively.

Dynamic optimization problems in the areas of warehousing, production and intralogistics arise for example in the control of portal cranes, transport vehicles, or production lines. In the light of progressing digitalization in operations and supply chain management, the use of mathematical and simulation-based optimization models is an important field of research. When optimizing such processes, dynamic changes occur continuously and must be considered. Therefore, proactive and adaptive optimization algorithms are developed in the JRC adaptOp, which can observe and react on change events, are able to continuously learn in order to predict upcoming changes and adapt their search strategy over time. By combining heuristic algorithms and machine learning, optimization algorithms are developed which recommend reasonable and tailored actions in order to support and guide human operators.

In addition to the development of a software environment for adaptive optimization, the formulation of new dynamic problem models and the definition of corresponding benchmarks are key milestones in the JRC adaptOp. Machine learning methods are used as an integral part of the solution procedure in order to predict upcoming events, develop potential future scenarios, and automatically select and parameterize adequate optimization strategies. Finally, the performance of the developed methods is assessed in simulation experiments and evaluated at the company partners' test environments under realistic conditions.

Homepage: <https://www.adaptop.at>

Additional Information

Additional funding for 3 months can be provided.

Accommodation is available in the [Studentenheim Hagenberg](#), which is located at the Hagenberg Campus of the University of Applied Sciences Upper Austria and offers single rooms at a reasonable price.

Hagenberg is an idyllic town in the beautiful Mühlviertel, in the heart of Upper Austria. In the last decade, Hagenberg has established itself as an internationally recognized center for computing and software development.

The [University of Applied Sciences Upper Austria, Hagenberg Campus](#) is part of the [Softwarepark Hagenberg](#), the largest technology park for software in Central Europe. The university was founded by RISC (Research Institute for Symbolic Computation), one of the eight research institutes of the Softwarepark. The university and its students benefit from the vigorous interaction and synergy between the research institutes, the companies and the various educational institutions within the Softwarepark Hagenberg.

The outstanding mix of most modern technology combined with the picturesque setting of the Hagenberg castle gives the town its unique flair. Located just 20km north of Upper Austria's capital Linz, Hagenberg offers internationally recognized, application-oriented research and education in the field of software and information technology and currently hosts more than 1.500 students.