

The **Vienna Graduate School on Computational Optimization (VGSCO)** is a joint research and training program of the **University of Vienna, TU Wien, IST Austria** and **Vienna University of Economics and Business** funded by the **Austrian Science Funds (FWF)**. Its main goal is to give PhD candidates a comprehensive training in different areas of optimization with special emphasis on algorithmic and numerical aspects. It fosters scientific collaboration between the PhD students and their advisors representing a broad spectrum of topics and areas in the field of optimization.

The VGSCO currently announces a PhD position in the area of

### **Optimization and Artificial Intelligence Techniques for Real-World NP-hard Problems (TU Wien, Supervisor: Nysret Musliu)**

*Real-life problems in domains as diverse as health care, logistics, production and education are frequently very challenging and their solutions impact the people involved as well as the efficiency and organizational cost of operations. Although the state-of-the-art techniques can solve problems in many applications, new and challenging problems are arising and there is a need for the development of efficient solving methods in these domains. The aim of this PhD thesis is to investigate new problem solving techniques for challenging real-world combinatorial optimization problems. The topics of interest include:*

- *Investigation of various solving paradigms (constraint programming, integer programming, (max)SAT, answer set programming and meta/hyper-heuristics) for new combinatorial optimization problems.*
- *New solving strategies based on hybridization of artificial intelligence and optimization methods.*
- *Exploiting machine learning in the process of automation of problem solving techniques.*
- *Automated algorithm selection and configuration.*
- *Problem solving techniques based on (Hyper)graph decomposition techniques such as tree decomposition and hypertree decomposition.*

*The candidates are expected to have a strong background in algorithms and data structures as well as strong problem-solving and programming skills.*

The advertised position is associated with the Faculty of Informatics of the **TU Wien** in the Christian Doppler Laboratory for Artificial Intelligence and Optimization for Planning and Scheduling, led by Priv.-Doz. Dr. Nysret Musliu. The successful candidate will become a member of the **Vienna Graduate School on Computational Optimization**. The duration of the employment is of 3 years with possibility of extension. The extent of employment is 30 hours per week. The annual gross salary is approximately 31,000 €. The planned start of the position is autumn 2020.

#### **Application Requirements and Procedure**

The candidates must have a master degree (or equivalent) in *Computer Science* or *Mathematics* at the moment the PhD position starts. The application documents should contain a letter of motivation; the scientific CV with publication list, if available; higher education certificates/diplomas; the diploma/master thesis and letter(s) of recommendation. Applications have to be submitted at: [vgSCO.univie.ac.at/positions/application](https://vgSCO.univie.ac.at/positions/application). The deadline for applications is **August 31, 2020**.