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

Large-Scale Optimization for Machine Learning
(Institute of Science and Technology Austria, Supervisor: Dan Alistarh)

Machine learning has made considerable progress over the past decade, matching and even surpassing human performance on a varied set of computational tasks. This progress has been enabled by the widespread availability of large datasets, as well as by improved algorithms and models. At the heart of this progress stand advances in the ability to perform complex optimization tasks on large-scale datasets and machine learning models, in particular deep neural networks. One key aspect of large-scale optimization is the ability to run instances in a distributed manner, for example via multi-node parallelism.

The focus of this project is to investigate new techniques for large-scale optimization in the context of machine learning applications. On the theoretical side, we plan to focus on developing scalable optimization methods, in particular methods which use second-order information, as well as on understanding the relationship between the training accuracy of the resulting models and their generalization properties. On the practical side, we plan to focus on applications to training deep neural networks, but also on methods for model compression via pruning or quantization. The ultimate goal is to develop a well-reasoned and computationally-efficient set of methods, which exceed the state-of-the-art in this area.

The candidates are expected to have a solid computer science background, with focus on algorithms or optimization. Strong implementation skills would be a plus.

The advertised position is associated with graduate school program at **IST Austria** in the research group of **Prof. Dr. Dan Alistarh**. 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. Employment is as a full-time PhD student at IST, and the planned start of the position is fall 2020.

Application Requirements and Procedure

The candidates must have a BSc or MSc degree (or equivalent) in *Computer Science* or *Mathematics* at the start of the PhD position. Application documents should contain a letter of motivation; 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. The deadline for applications is **June 15, 2020.**