

## **Structured Numerical Methods for PDEs Based on Low-Rank Tensor Networks and Artificial Neural Networks (University of Vienna, Supervisor: V. Kazeev)**

The topic of the proposed project is structured numerical methods for PDEs based on tensor networks and artificial neural networks.

A low-rank factorization of a matrix provides its low-parametric bilinear parametrization in terms of two factors. Tensor networks generalize this to the case of many dimensions, a notable example being known as matrix-product states (MPS) in the simulation of quantum systems and as tensor-train (TT) decomposition in numerical analysis. The goal of the project is to develop, analyze and implement adaptive, data-driven numerical approximations and algorithms for PDE problems based on the separation of variables and iterated function composition, combining tensor networks with techniques from machine learning.

We are looking for an independent scientist with interests in numerical mathematics and computational science. Applications have to be sent via the Job Center of the University of Vienna at the [Reference number 10483](#). The deadline for application is **March 5, 2020**.