The Technische Universität München (TUM) is one of Germany's leading competence centers for nuclear applications. With the Forschungs-Neutronenquelle Heinz Maier-Leibnitz (FRM II), TUM operates one of the most powerful research reactors in the world. Being a nuclear facility, radiation protection and waste management are topics of major interest, for which gamma spectroscopy is always required to identify relevant nuclides. In addition, it is also used for environmental monitoring. With profound knowledge in neural networks and machine learning techniques, the Hochschule München is the perfect partner to develop novel methods for the evaluation of gamma spectra.

In this context, the FRM II and the Hochschule München corporately are looking for a

M.Sc. student in physics or informatics (m/f/d)

Your task

Embedded in the conversion program at the FRM II, the working group "High Density Fuels/Reactor Physics" operates a unique uranium laboratory, which allows the handling of nuclear fuel. For the operation of such laboratory, the waste management plays an utmost important role and gamma spectroscopy is the preferred method to identify nuclides in order to dispose of accruing trash packages. The increasing capabilities of artificial intelligence and machine learning, offer the development of new methods that allow for an automated and fast nuclide identification.

The proposed M.Sc. thesis aims to bring the evaluation of gamma spectra an important step forward by
- Thorough check of the quality of the available training data
- Set up of a suitable neural network to reliably identify nuclides in unassigned gamma spectra
- Identification of influences of different gamma detectors on the nuclide assignment

This position offers a stimulating scientific atmosphere within an international collaboration project with the leading experts in the field. The student will get access to high-performance computers to conduct the work. Day-to-day work is done under optimal supervision by scientists at FRM II and Hochschule München.

Your qualifications
- Sound programming skills in one of the following languages: Python or Matlab
- First experiences in dealing with artificial intelligence and machine learning, e.g. using TensorFlow

Application

Applicants should send a cover letter and motivation statement with research interests and expertise, including a curriculum vitae and a current attestation of grades to stefanie.vogl@hm.edu and christian.reiter@frm2.tum.de.