

Master's Thesis: Validation of AI-based pulmonary nodule malignancy risk prediction models for lung cancer screening

Background

Screening for lung cancer with low-dose Computed Tomography (LDCT) is expected to reduce lung cancer mortality rates. Over the past years, many artificial intelligence (AI)-based tools for pulmonary nodule malignancy risk prediction have been developed to support radiologists in their decision-making. To assess the real-world performance and reliability of these tools, an external validation on large multicentric lung cancer screening data is important.

Task & Goals

The main goal of this thesis is to validate existing AI-based pulmonary nodule malignancy risk prediction models on data from a real-world lung cancer screening trial in Canada.

To achieve this, existing AI-based models for malignancy risk prediction must be implemented and deployed on a MLOps platform. This includes containerization of the models using Docker. Following deployment, an evaluation strategy must be developed to assess the clinical performance of the models. Lastly, the performance of multiple models should be validated and compared.

Your profile

- Highly motivated Master's student (data science, mathematics, informatics, statistics or similar) with a general interest for machine learning (ML) and medical image data
- Considerable experience in programming with Python
- Basic understanding of ML and common ML frameworks such as PyTorch

What we offer

- Excellent research environment in one of the largest university hospitals in Europe
- Interdisciplinary team of trained research experts (data scientists, physicists, statisticians, and radiologists)
- Challenging problems which require technical skills, creativity and an awareness for the subtleties of artificial intelligence research in medicine
- Guided access to real world medical image data

If you are interested or wish to learn more about the project, do not hesitate to contact Johanna Topalis (johanna.topalis@med.uni-muenchen.de), Dr. Katharina Jeblick (katharina.jeblick@med.uni-muenchen.de) or Prof. Dr. Michael Ingrisch (michael.ingrisch@med.uni-muenchen.de).