## Master Thesis Topic

# Medical Images Classification using Semi-supervised Learning Algorithms

## Keywords

Machine Learning, Deep Learning, Semi-supervised Learning, Medical Image Classification, Python, Tensorflow, Pytorch.

## Description

Nowadays, machine learning and AI systems can be seen in almost every aspect of life. One active research aspect is medical image classification, which aims to classify medical images into different categories to help doctors with disease diagnosis or further research. Recent deep learning methods, relying on having large-scale and annotated datasets, provide an effective way to construct an end-to-end model that can compute final classification labels. However, acquiring these datasets is usually very expensive, time-consuming, and requires human experts, especially in the medical field. Semi-supervised learning (SSL) is one track of machine learning that aims to reduce the reliance of machine learning models on just labeled data and tries to exploit further the unlabeled data in the training process.

In this Seminar topic, the student is expected to learn the cutting edge techniques and algorithm for SSL and how they perform in the problem of medical image classification. The student will gain lots of practical experience as well as good knowledge of state-of-the-art research in the fields of deep learning and end-to-end AI systems.

The tasks are as follows:

- Analyze and understand the state-of-the-art deep learning architecture (DNN, CNN, VAE, ...).
- Review and understand the latest literature on the topic of semi-supervised learning and medical image classifications.
- Research the effect of using various SSL algorithms in the classification of different medical images.

## Contact

Mahdi Barhoush, Room 340 (ICT Cubes), E-mail: mahdi.barhoush@inda.rwth-aachen.de