



CAS in Artificial Intelligence in Medical Imaging

Program Plan

Note that the minisymposium is a public event, while the other on site sessions are only open for CAS participants. Except for module 2, which consists only of an e-learning part, the other modules are taught as blended learning courses (i.e. in general consisting of a kick off session followed by an e-learning block and a wrap up session). On site events are indicated in red.

- **Mini-Symposium: Artificial Intelligence in Medical Imaging (public)**
 The study program starts with a public mini-symposium in September 2019, providing an overview and current trends of Artificial Intelligence in Medical Imaging.

 - **Date:** **09.09.2019**

- **M1 Artificial Intelligence Project**
 The first module introduces data sets for a concrete AI project in Medical Imaging. It teaches participants on how to use tools to prepare imaging data for analysis with Artificial Intelligence.
 After introducing basic principles and procedures for data preparation, participants will be able to take part in data collection processes as well as in the evaluation of large amounts of medical data by the use of Artificial Intelligence. Throughout the period of the CAS, participants will use different AI methods to analyze the data.

 - **Kick off:** **10.09.2019**
 - **Wrap up:** **03.07.2020**

- **M2 Prerequisites for Statistics and Programming (e-learning)**
 Module 2 is providing preliminary knowledge on statistics and programming necessary to tackle the following modules. Participants will acquire basics in Python programming that are relevant for data analysis.

 - Starting date: 10.09.2019
 - Ending date: 10.11.2019

- **M3 Fundamentals in Artificial Intelligence**
 Module 3 teaches basic knowledge in AI models including mathematical concepts that are relevant for “building blocks” of neural networks. Participants will learn about basic elements of AI models including e.g. data representations, strategies for optimization and methods for the evaluation of AI models.

 - Starting date: 08.11.2019
 - **Workshop:** **13.12.2019**
 - **Wrap up:** **16.01.2020**

- **M4 Applied Artificial Intelligence in Medical Imaging**

Participants will learn about the relationship between a clinical problem and a machine learning problem as well as the influence of training data quality and annotation errors on the ability of algorithms to learn.

Participants will be introduced to state-of-the-art AI models and learn how to apply and validate them in practice.

 - Kick off: 17.01.2020 and 18.01.2020
 - Wrap up: 16.03.2020
- **M5 Applications of Artificial Intelligence**

Module 5 reviews applications of AI-assisted image interpretation technologies in radiology, neuroradiology, and nuclear medicine.

In order to integrate AI in the clinical workflow for improved efficacy, participants will be able to select and benchmark the required hard- and software for AI.

 - Workshop: 21.04.2020 and 21.04.2020
- **M6 Legal and Ethical Challenges**

New and emerging medical technologies and devices are regulated for safety and efficacy by competent authorities such as Swissmedics in Switzerland. In module 6, participants will be able to identify and solve legal ethical, and regulatory challenges related to the whole life cycle of AI technologies in the medical sector.

 - Kick off: 15.05.2020
 - Wrap up: 02.07.2020