

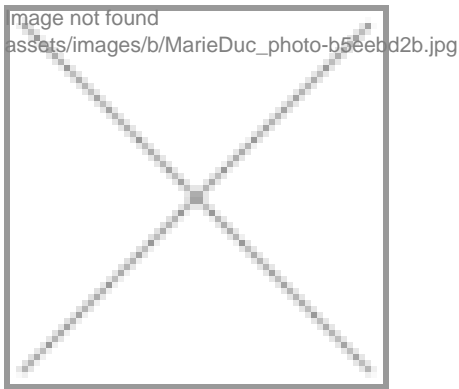
Machine Learning in Digital Histopathology

HOST INSTITUTION: Werner Siemens Imaging Center, Tübingen, Germany

The Werner Siemens Imaging Center (WSIC) is situated in the department for Preclinical Imaging and Radiopharmacy in Tübingen, Germany. The center is internationally renowned for its multidisciplinary research in imaging science.

The WSIC boasts a well-equipped laboratory which includes several imaging devices (PET, MRI, CT, SPECT, OI). The laboratory is equipped with all necessary cell culture and histology labs as well as onsite animal housing and surgery rooms. The in-house radiopharmacy unit is equipped with a cyclotron for the production of radioactive isotopes and can synthesize a number of radiotracers.

Close collaborations with the departments of radiology and nuclear medicine enable rapid clinical translation of research findings. The laboratory closely collaborates with the Max Planck Institute for Intelligent Systems in Tübingen.



DESCRIPTION OF THE PROJECT (ESR8 - Marie Duc):

The ESR will work in the field of image analysis and algorithm development for the automatic analysis of histopathology.

Tumor heterogeneity is an important parameter with clear links to outcome and prognosis. It can often be observed with imaging (e.g., PET, MRI) or detected through image analysis methods, but always requires confirmation with histology. Supervised machine learning methods would strongly benefit from a one-on-one alignment of histology with imaging, but this alignment is usually very complicated.

Histopathology can provide information about different biological properties in a tumor and provide a thorough view into the tumor biology. The objective of this project is the development of algorithms to analyze histopathological images, in particular to quantify heterogeneity and detect distinct regions within the tumor. In addition, the proper alignment of histology with imaging data is needed.

Within the project, several secondments at other HYBRID partners are planned.