

## Cloud and Edge Computing of Surgical AI Workflows



### Scope of work:

The "Translational Surgical Oncology" department at the National Center for Tumor Diseases (NCT) focuses on advancing computer- and robot-supported assistance systems for surgery, bridging the realms of computer science and medicine.

These systems heavily depend on intricate machine learning pipelines comprised of multiple models, each trained on extensive datasets. The utilization of edge and cloud computing is essential to enable real-time processing of data and inference tasks, facilitating faster decision-making and enhancing the efficiency and effectiveness of surgical procedures.

### Goal of the work:

This research aims to compare promising Confidential Computing approaches integrated with Federated Learning, as well as explore the potential of Cloud and Edge Computing with streaming pipelines such as GStreamer and storage systems like Pravega, to handle sensitive medical data in surgical AI workflows. This research is part of two European Union Research Projects; [CloudSkin](#) and [NearData](#).

### We are looking for:

Motivated students with an interest in interdisciplinary work in AI-based computer- and robot-assisted surgery. Applicants should demonstrate commitment, teamwork skills, and a passion for contributing innovative ideas. An intermediate level in Python, and PyTorch is required. Additionally, ROS knowledge is desirable.

### Contact:

Dipl.-Ing. Max Kirchner & M. Eng. Reuben Docea  
[max.kirchner@nct-dresden.de](mailto:max.kirchner@nct-dresden.de)  
[reuben.docea@nct-dresden.de](mailto:reuben.docea@nct-dresden.de)  
<https://www.nct-dresden.de/tso.html>