

## **MSc project in Medical Physics**

### **Development and validation of a real-time interface to intrafractional x-ray images for tumor motion monitoring**

@ Medical University of Vienna / AKH Wien

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The Department of Radiation Oncology at the Medical University of Vienna offers a master project in medical physics starting from March 2023.

#### **Motivation:**

Breathing motion during irradiation is a challenge in radiation oncology, impeding precise dose deposition to tumours near the diaphragm. A possible solution is online tumor tracking. The basis for online tumour tracking is real-time tumour motion monitoring in combination with motion prediction for compensation of latencies (e.g. from image acquisition or data transfer and processing). To obtain all data in real-time a interface between the treatment machine an a PC in the control room is required.

#### **Work description:**

The goal of this MSc project is to implement and validate a real-time connection of our research hardware and the clinical treatment machine. This is done in close collaboration with the vendor of the treatment machine. The validation of the connection should include latency measurement of data transfer and test measurement using a breathing phantom.

The main tasks of this project are:

- Implementation of the vendor software for real-time connection
- Development of data stream to research software
- Measurements of latecy of data connection depending on different image acquisition parameters
- Validation of the real-time connection using a breathing phantom

#### **Qualifications:**

- Student of computer science, physics, biomedical engineering or similar technical studies
- Fluent in English (oral and written)
- Analytical skills and ability to work independently on a project basis
- Programming experience in Python and C++

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