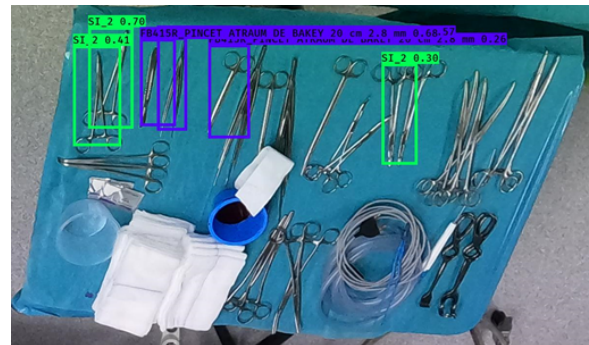


Master Thesis project *In Biomedical Machine Learning*

Analyse video images of surgical instruments in operating rooms (OR's) using machine or deep learning.

Project overview

Within hospitals, optimizations in the operating room (OR) and Central Sterile Supply Department (CSSD) could lead to improved efficiency, better working conditions for medical professionals, lower costs and a reduction in CO2-emissions. Surgical instruments affects both areas, with the potential of optimizing the content of surgical trays. The utilization rate is an appropriate indicator for surgical tray optimization, but until now this data has only been acquired manually. The application of computer vision for the recognition of surgical instruments is a promising technology. It fits within the workflow in the OR, as it does not interfere with the work of the OR personnel and requires no additional tasks, and there is no need to modify the surgical instruments. Limited research has been performed previously on this subject. As they have only tested the application of computer vision in a laboratory setting, the challenges that come along with the implementation are excluded. An additional challenge will be to couple the utilization of the surgical instrument to the phase in which the procedure is. This information can be used for the registration of the length of the procedure which can be used for future planning of surgical procedures.



For this project, data already has been acquired in a real OR setting and the challenge will be to develop video analysis techniques to recognize surgical instruments outside the surgical field in the operating room. Given all the advances in the field of artificial intelligence, deep learning is a good candidate to be used to accomplish this task.

Where and when?

The project will take place at the Division of Image Processing, Department of Radiology, LUMC, <https://lkeb.lumc.nl/>, and the Operating room center. You will be supervised by dr.ir. Anne van der Eijk and dr.ir. Jouke Dijkstra. Start date of the project is flexible, duration is 6 – 12 months.

Who?

Students with a major in computer science, mathematics, biomedical engineering, artificial intelligence, physics, or a related area in the final stage of master level studies are invited to apply. Basic knowledge of Python programming is required, as well as interest and experience with machine learning and deep learning.

Interested?

Contact: dr.ir. Jouke Dijkstra (j.dijkstra@lumc.nl) or dr.ir. Anne van der Eijk (a.c.vandereijk@lumc.nl)