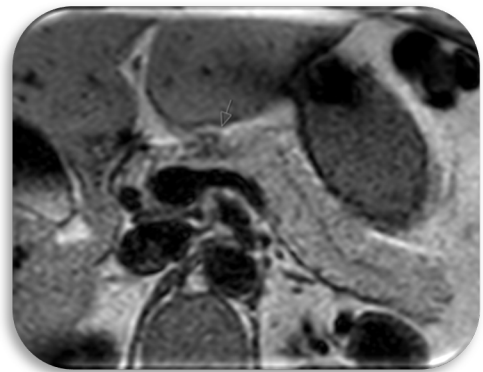


Master Thesis project *In Biomedical Machine Learning*

Artificial Intelligence for Early Pancreatic Cancer Detection

Project overview

Individuals with a *CDKN2A* (p16) mutation have an estimated 15-20% lifetime risk of developing pancreatic cancer (PC). Since 2000, approximately 340 individuals with a *CDKN2A* (p16) mutation were offered pancreatic surveillance in the Leiden University Medical Center using annual magnetic resonance imaging (MRI). The main goal of surveillance is to identify high-grade dysplastic (HGD) precursor lesions and stage 1 PC that are associated with a survival benefit in comparison to later stage diagnosis. Published studies of surveillance programmes highlight the potential of finding early stage PC, but it remains extremely challenging to detect HGD. The majority of HGD originates from microscopic lesions and do not cause specific imaging findings. We hypothesize that deep learning (DL) algorithms would enable us to detect and monitor subtle changes associated with development of pancreatic cancer on longitudinal MRI, allowing intervention at an earlier, curable stage.



Goal

To develop AI methods to be applied to longitudinal MRI of individuals with a *CDKN2A* (p16) mutation to identify and indicate changes associated with development of pancreatic cancer.

Where and when?

The project will take place within the Departments of Radiology and Gastroenterology & Hepatology, LUMC. You will be supervised by J. Dijkstra, M. Engels and D. Klatte. The start date of the project is from January or February 2022, duration is 8-12 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. Jouke Dijkstra (j.dijkstra@lumc.nl) or dr. Derk Klatte (d.c.f.klatte@lumc.nl)