

PhD project

Robustness of Artificial Intelligence

PhD Simon Lyck Bjært Sørensen siso@mami.sdu.dk
SDU Robotics, The Maersk Mc- Kinney Moller Institute,
University of Southern Denmark

Abstract

Artificial Intelligence (AI) based Software as a Medical Device (SaMD) is used more in the medical world than ever before. Currently, the algorithms used in medical AI have only been in a locked state when deployed, where the same input would always give the same output. Medical AI models are deployed in a locked state due to the approval system is not suitable for continuous learning since a change in the model will need a new premarket review.

An AI-based SaMD deployed with continuous learning will train on the presented data. Continuous learning will make the SaMD gain a better performance overall, and on the specific population, the model is deployed on. Continuous learning is also a subject of the catastrophic forgetting problem, where the model tends to forget what it has learned previously as new unseen data is presented to it. This problem will have to be monitored and handled to ensure that a SaMD system with continuous learning will not overfit the presented situation while deployed.

This Ph.D. project will facilitate continuous learning in medical AI by creating a framework that can ensure that continuous learning-based SaMD is kept within certain boundaries while being deployed.