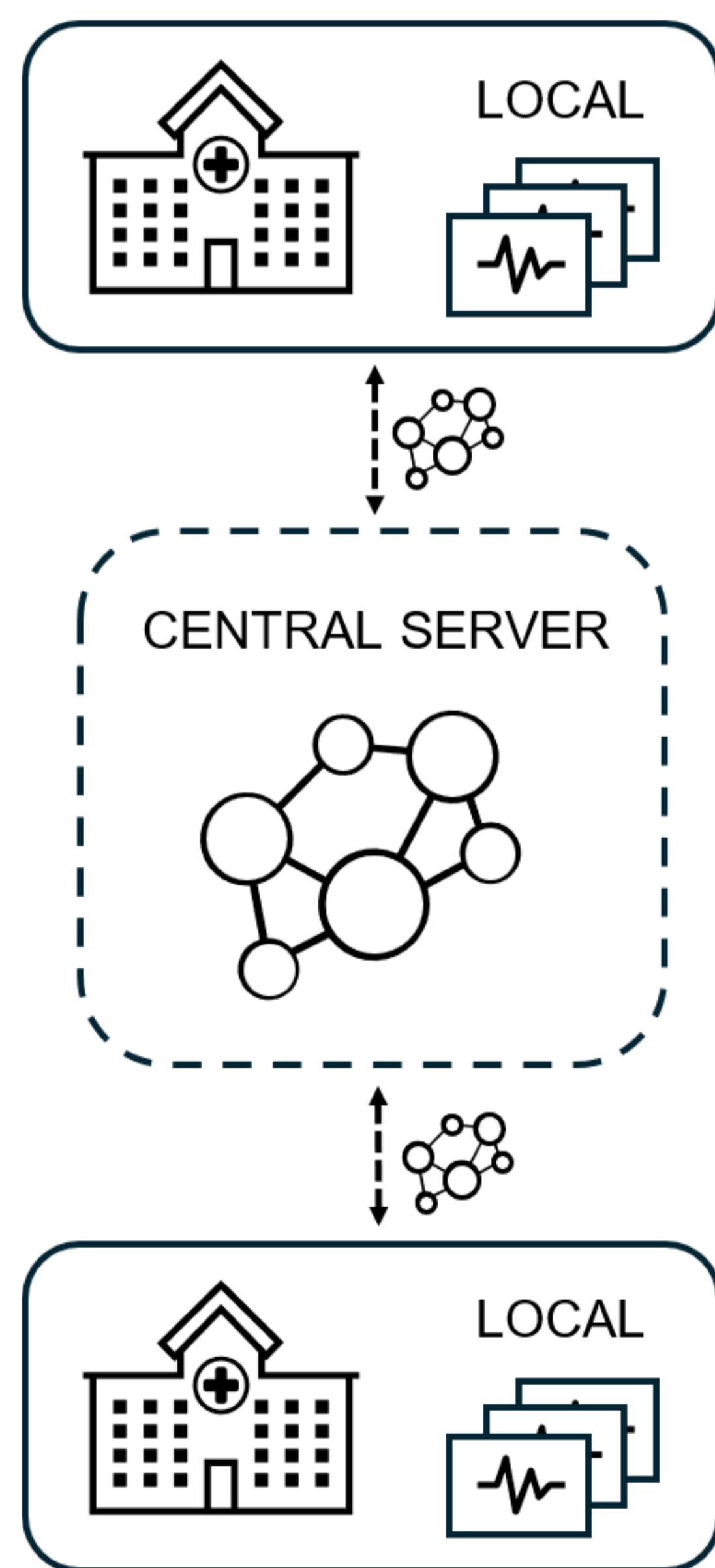


Federated vs. Centralized learning: A Comparative Analysis of CNN-Based Myocardial Infarction Classification

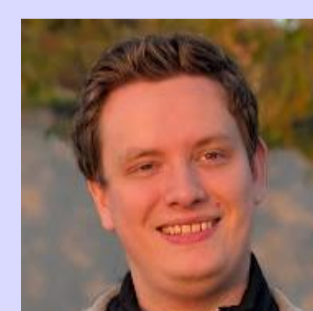
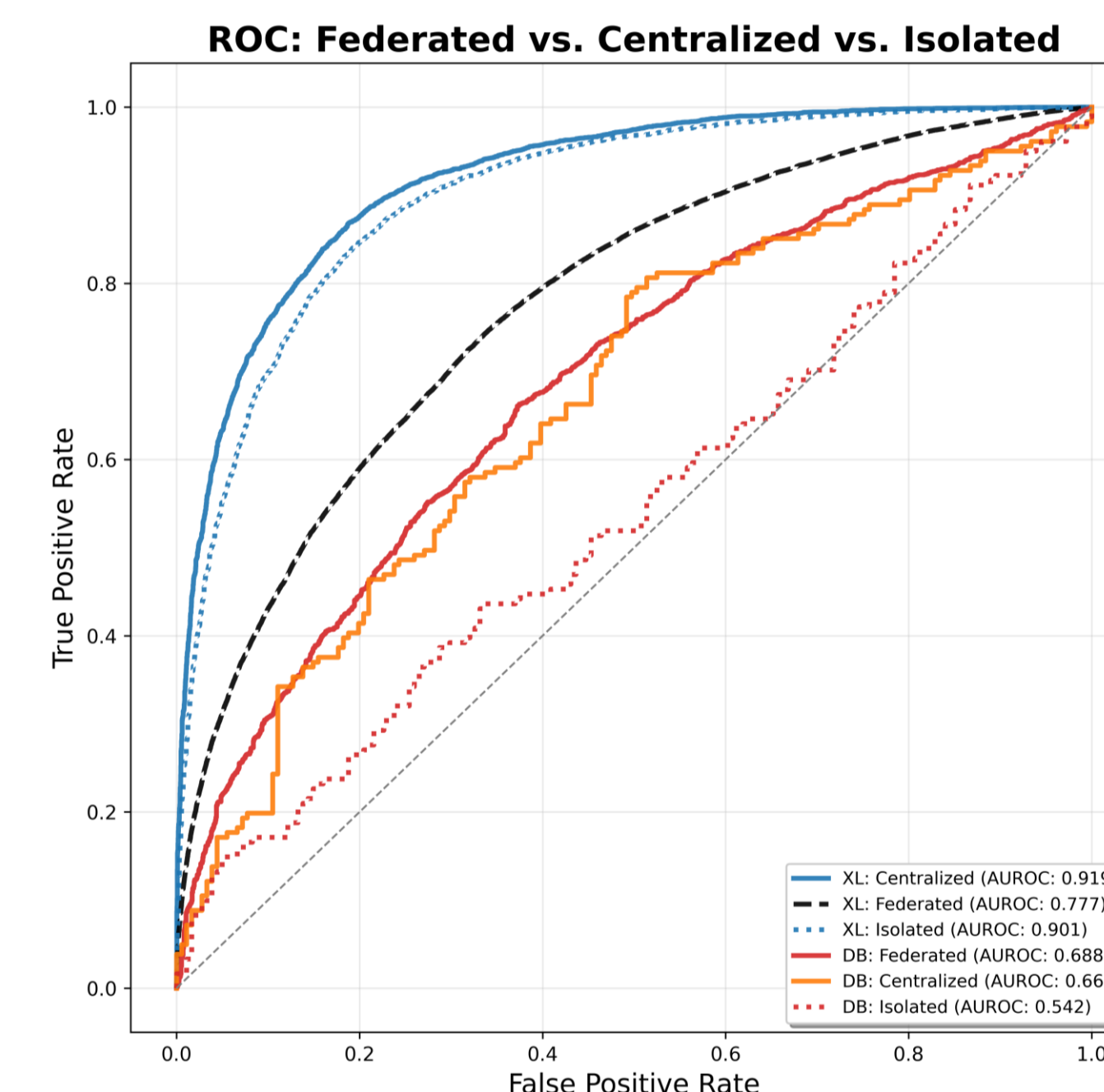


Purpose and aim

Today collaboration between hospitals for developing data-driven models is difficult. With privacy regulations, ethical concerns and legal restrictions like GDPR making sharing large and diverse datasets not possible. Therefore, this project aims to do research on the framework for federated learning (FL). Each hospital keeps its data locally and only shares model updates, ensuring privacy. The purpose is to look at the quality difference between conventional centralized machine learning and federated learning.

Results and important findings

The figure summarizes the outcomes of our experiments. While centralized training achieved the best performance on PTB-XL, FL exceeded both isolated and centralized training on PTB Diagnostic, and isolated training outperformed FL on PTB-XL. One possible reason PTB Diagnostic gains more from FL than PTB-XL is that PTB-XL is almost ten times larger; however, why FL surpasses centralized training on PTB Diagnostic remains unclear.



Daniel Vikan
240864@usn.no
 Cybersecurity and digitalization

Supervisor: Bjørn-Jostein Singstad (bjosin@siv.no)