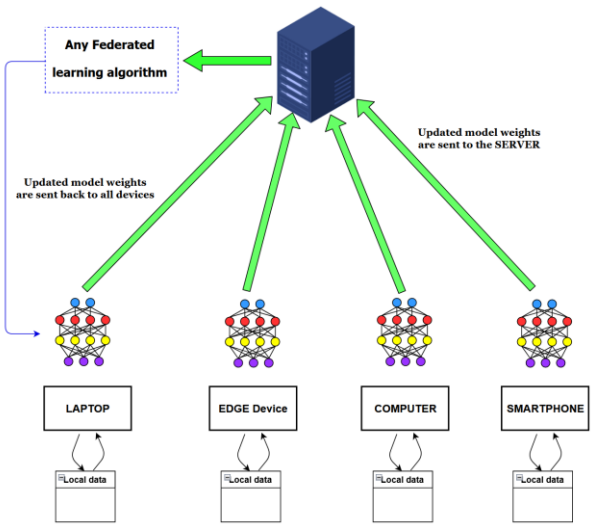
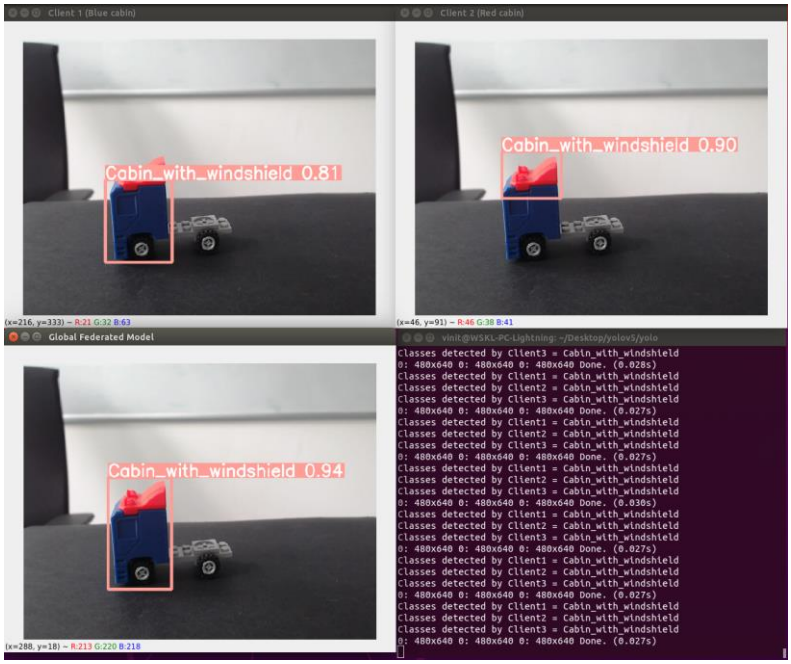
Werkzeugmaschinen und Steuerungen KAISERSLAUTERN

Studien- / Masterarbeit

Hyper-parameter tuning of federated learning use-case for various scenarios

Federated learning (FL) is rapidly gaining popularity as a promising solution for decentralized machine learning. In FL, multiple clients collaborate to train a global model that performs optimally on each client's local test data. The application of FL in the manufacturing industry holds great potential. However, fundamental challenges related to hyperparameters remain unanswered within the scientific community. Questions such as the optimal number of clients in a communication round, the requirement of specific amounts of data for each client, and the impact of new clients joining on the global model are yet to be addressed. At WSKL, we aim to provide answers to these critical questions.





Aufgabenstellung/Tasks:

- Literature research for SOTA (state of the art) federated learning (FL) algorithm
- Automating the previously written code and running various test
- Training various instances of federated learning models, and detailed documentation of various hyper parmeter effects on the global model
- Implementation of FL algorithms

Aufgabenstellung / Pre-requisites:

- Basic knowledge of Deep learning and Computer vision
- Coding in python and knowledge of Frameworks like TF/Pytorch
- (Good to know YOLOv5, image classification, server-client models)

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The scope is adapted to the nature of the work

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