Project Descriptions

Project 1: Binary Semantic Segmentation
Explored semantic segmentation using pre-trained deep learning models with transfer learning. Implemented U-Net models with various encoders (ResNet34, EfficientNet-B0, MobileNetV2) on the Oxford-IIIT Pet Dataset, including custom data loaders and preprocessing pipelines. Models were trained and evaluated using metrics such as accuracy, IoU, and F1 score.

Project 2: Chord Implementation
Implemented a simple distributed storage system on top of the Chord protocol, allowing text files to be stored and retrieved across multiple peers. Developed a command-line client to create or join a Chord ring, perform file lookups, store files, and display the node's local state.

Project 3: Computer Vision
Completed lab exercises and a project as part of a Computer Vision course. The work included four labs and one larger project covering key computer vision techniques and applications.

Project 4: Computational Methods in Bioinformatics
Implemented various bioinformatics methods from scratch as part of course assignments. Topics included sequence alignment, main chain modeling, systems biology, protein clustering, and Markov state models for molecular dynamics.

Project 5: Deep Machine Learning
Completed four course assignments focused on deep learning, gaining hands-on experience with neural network architectures, training techniques, and model evaluation.

Project 6: ML Attacks (Master Thesis)
Developed code for multiple machine learning models used during my master thesis, including both off-the-shelf models and AutoML frameworks like AutoGluon. The project also includes feature extraction and filtering pipelines for analyzing IoT update network traffic.

Project 7: HTTP Server in Go
Implemented a concurrent HTTP server in Go capable of handling GET and POST requests from multiple clients using goroutines. The server serves local files, validates requests, returns appropriate HTTP status codes for errors, and manages up to 10 concurrent client connections.