Intelligently Identifying and Locating Electronic Components in Power System Circuit Diagrams

Team members: Kyle Jones, Daniel Polen, Alex Kem, Erick Zheng | **Faculty adviser:** Changqing Luo | **Sponsor:** Changqing Luo | **Mentor:** Changqing Luo
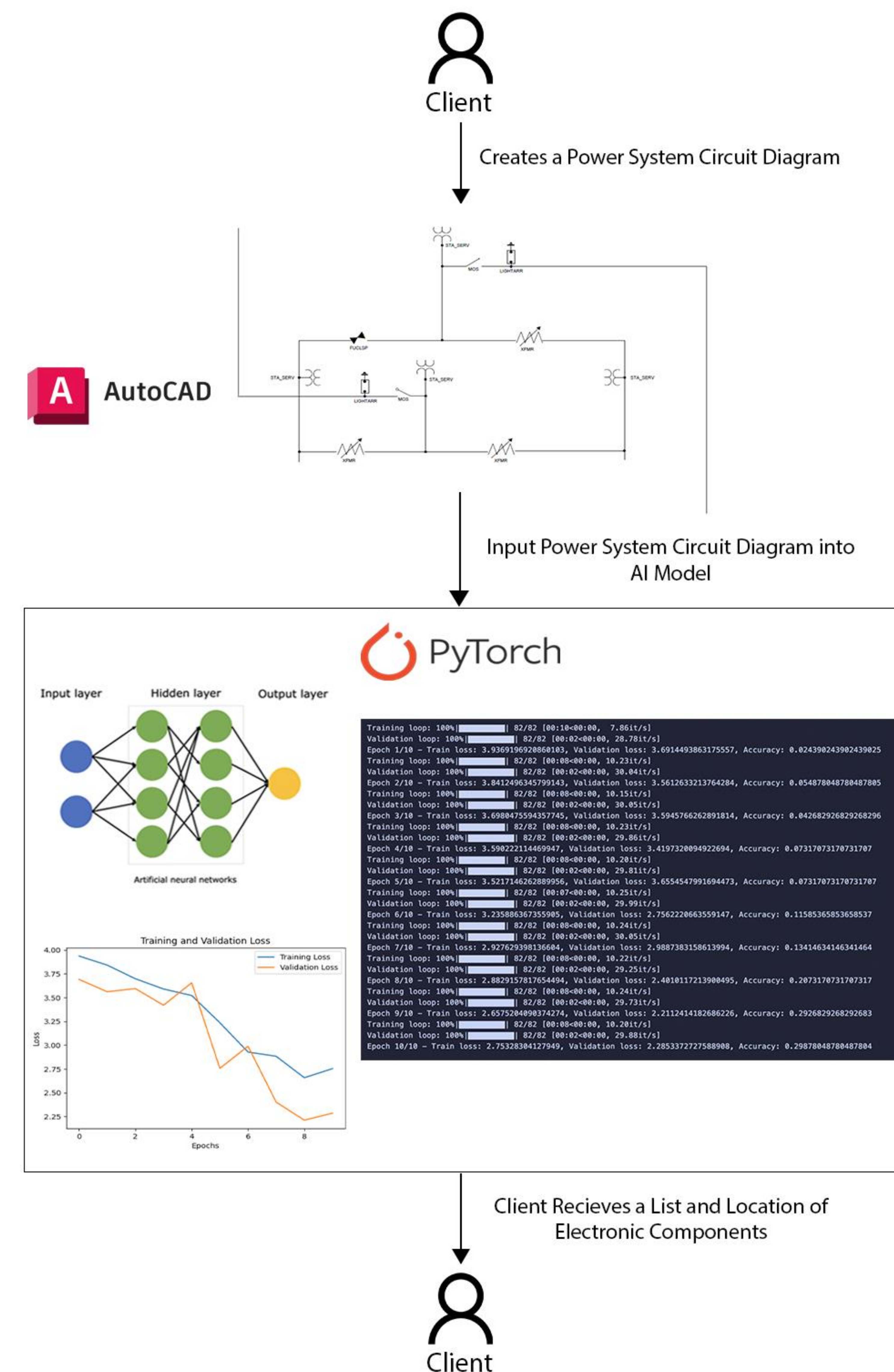
Problem Statement

- Given the large volume of diagrams handled by power companies, manual analysis is often inefficient and error-prone. By leveraging artificial intelligence and image processing techniques, this project seeks to detect various components and accurately determine their positions within these diagrams. This approach will enhance efficiency in power system design, planning, analysis, and troubleshooting.

Objectives

- Define key electronic components to be designed and collected into a dataset for training
- Process data into multiple formats suited to test and train the model on more images
- Design a machine learning model using PyTorch for image-based recognition
- Train the model on annotated diagrams while adjusting parameters to achieve desired accuracy
- Expand the ML model to be able to handle further information gathering from the diagrams regarding location of each component
- Develop more complex system diagrams using AutoCAD to be added to the dataset for further testing and training
- Conduct final testing after training on the new images to achieve the required level of performance and reliability

High Level Design

UML

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