Machine Learning with Graphs - Final Project Proposal: KAN-GPSConv

Yuval Hanuka
yuvalhanuka@mail.tau.ac.il

Yair Pickholz Berliner
Pickholz.yair@gmail.com

August 2024

1 Project Description

In this project, we aim to design and evaluate various architectures of GPS networks, incorporating Kolmogorov-Arnold Network (KAN) layers to enhance their capabilities. The integration of KAN layers is motivated by their advantages as presented in the paper, such as increased expressive power, improved interpretability, and support for continual learning. By leveraging these benefits, we hope to build a model that not only matches the performance of GPS networks but also offers greater expressiveness and interpretability.

We also plan to evaluate our models on various benchmark datasets presented in the original GPS paper,(the extent of this evaluation will depend on the time available, so we will do as much as we can within the project timeline). By analyzing the results, we aim to gain a deeper understanding of what the models learn and how they compare to the original network's performance. This comparison will help us better understand the strengths and weaknesses of the different methods and provide insights into the effectiveness of our proposed modifications.

Finally, we will conclude the proposal with a brief literature review, summarizing the key developments and research in the fields of Kolmogorov-Arnold Networks (KAN) and Graph Neural Networks (GNN). This review will highlight what has been done so far in these areas, providing context for our work and illustrating how our approach builds upon and contributes to the existing body of knowledge.