

Seminar

# Graph Neural Networks in Electronic Design Automation

Various problems in electronic design automation (EDA) take use of data that can be modeled as graphs. This includes the structural view on the design (e.g. netlists of gates), as well as behavioral aspects (for example, the control and data flow with the C(D)FG).

In recent research, the use of machine learning is also of high interest in EDA. Neural networks are a well known example. Here, issues like feature selection or the interpretability of the learned model are relevant. Furthermore, it is questionable, if more details of the problem can be incorporated in the machine learning model. Here, graph neural networks (GNNs) may be a suitable approach for tasks based on the graph representations. A graph structure is directly incorporated in the structure of the neural network and used to exchange information between different nodes. In EDA, this has been used to obtain for example transferable power estimation (GRANNITE).

In this proposal, the concept of graph neural networks and its potential (and already done usage) in EDA should be investigated.

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