Fast and Accurate PPA Modelling Using Transfer Learning

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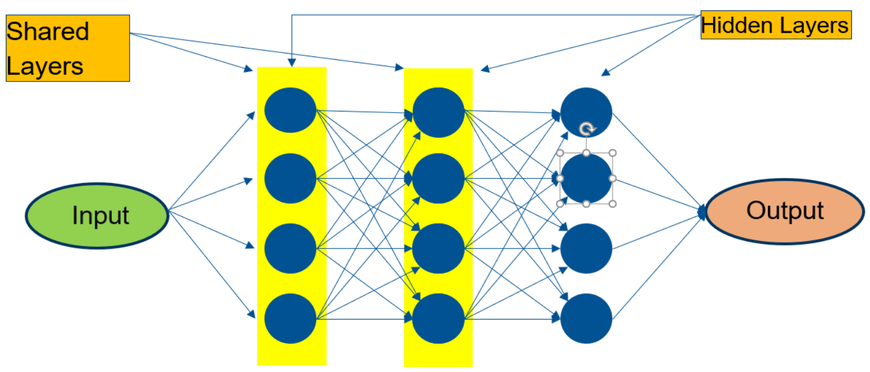
Introduction

- Machine Learning(ML) models: lot of data and high training time
- Transfer Learning: knowledge sharing, less data, less training time, higher accuracy

Neural Networks

- Shared layers for Transfer Learning



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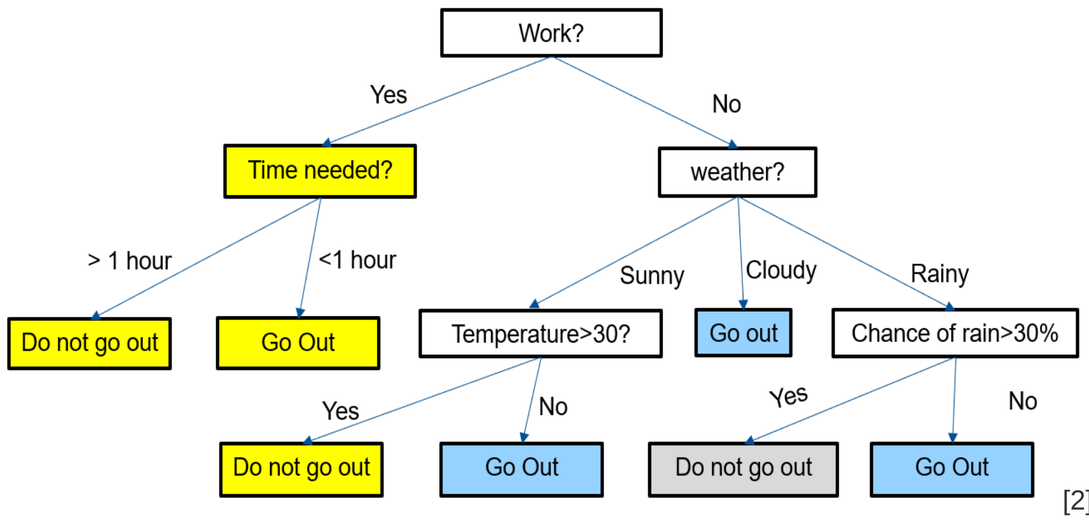
Decision Trees

- New branches added to base model



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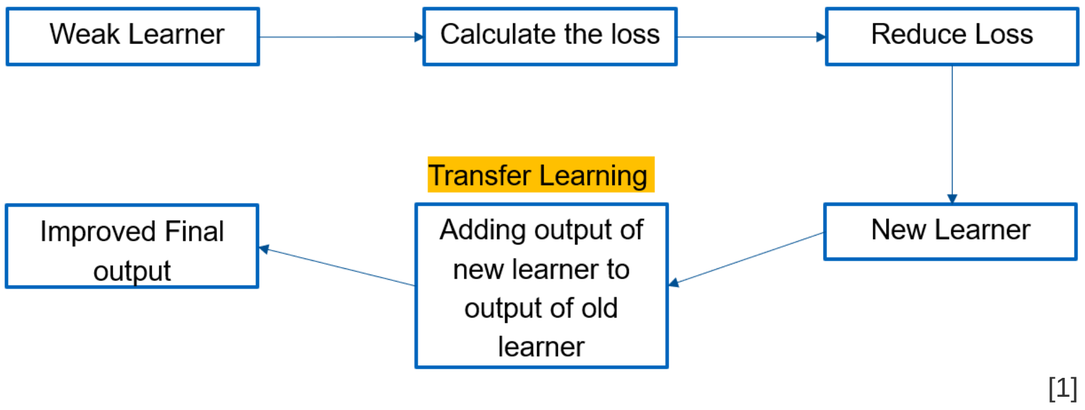
Gradient Boost Regressor

- Combination of weak learners



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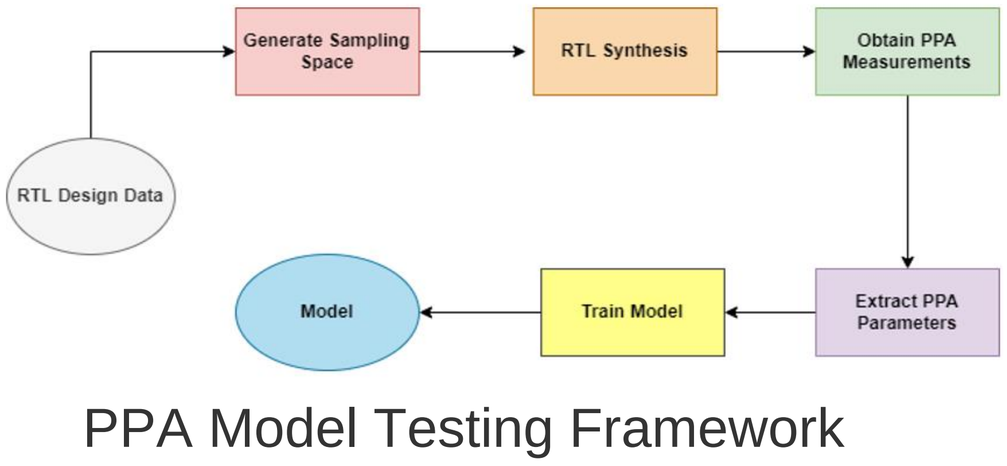
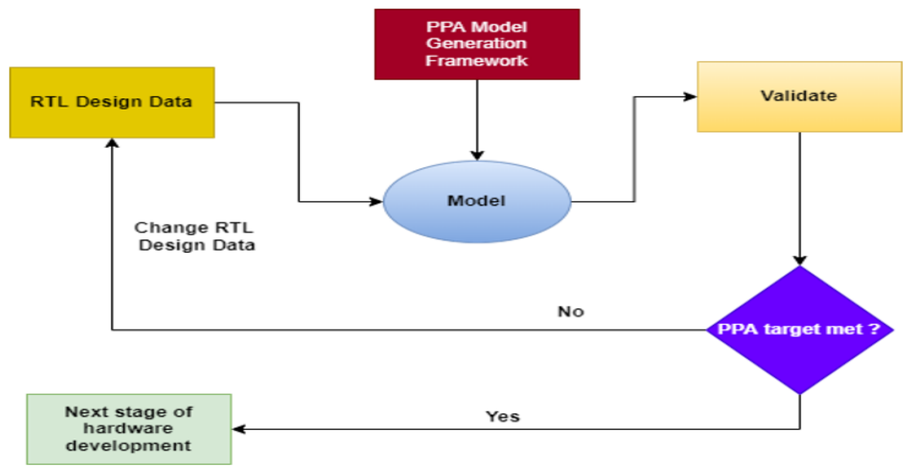
PPA Model

- PPA Model Generation Framework



- PPA Model Testing Framework



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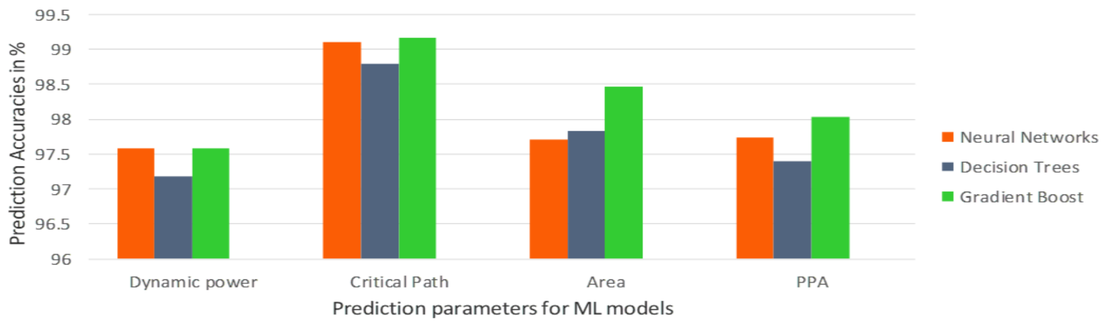
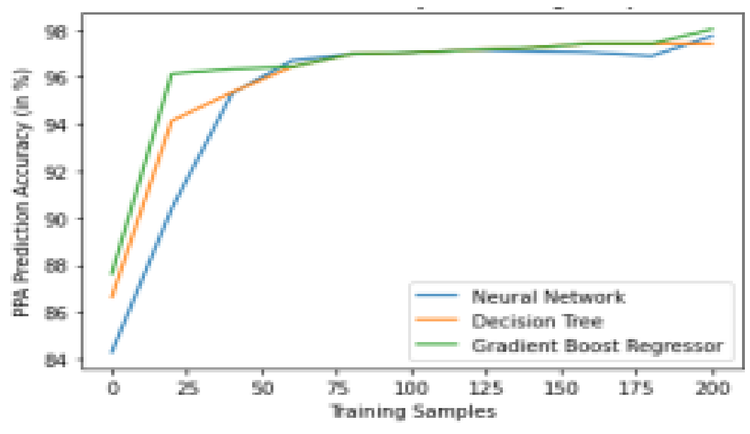
Results

- PPA Prediction accuracies



- Accuracy vs training samples



[1]

Reference

[1] W. R. Davis, P. Franzon, L. Francisco, B. Huggins and R. Jain, ”Fast and Accurate PPA Modeling with Transfer Learning,” 2021 IEEE/ACM International Conference On Computer Aided Design (ICCAD), 2021, pp. 1-8, doi: 10.1109/ICCAD51958.2021.9643533

[2] J. w. Lee and C. Giraud-Carrier, ”Transfer Learning in Decision Trees,” 2007 International Joint Conference on Neural Networks, 2007, pp. 726- 731, doi: 10.1109/IJCNN.2007.4371047.