

<https://www.sciencedirect.com/science/article/pii/S1566253521002360>

- Notes:

- DNN face challenges with tabular data because of lack of locality and mixed feature types
- In most cases, a deep model performs best on the datasets used in the respective paper, but significantly worse on other datasets. In these situations XGBoost usually outperforms on the alternate datasets
- Deep Learning is currently not all we need for tabular data, despite recent progress

- Ensemble Learning - improve performance and reduce variance by training multiple models and combining their predictions.
- Deep Model's performance is sensitive to the specific dataset
 - Useful when creating a specific classifier for your current dataset - Why it outperforms for our diabetes dataset
 - Underperforms when generalized to other datasets - Why we included the XGBoost dataset in our package in case others wanted to use it for other condition classification.
- The differences in performance are largely based on the hyperparameter optimization. Without proper hyperparameter optimization, XGBoost almost always outperforms DNN. But with proper hyperparameters for a specific dataset, the DNN can outperform XGBoost
- Hardest part of DNN in this case is optimizing the hyperparameters for the necessary dataset.