Baseball Hall of Fame Project

TTK28 Modeling with Neural Networks Exam

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Goal

Determine if an eligible Major League Baseball (MLB) player will make it into the Baseball Hall of Fame (HoF) based on career statistics.

- BBWAA and Veterans Committee can nominate and elect individuals to HoF
- Subjective voting system
- MLB players are eligible after playing 10 years
- Player, managers, umpires and executives are eligible

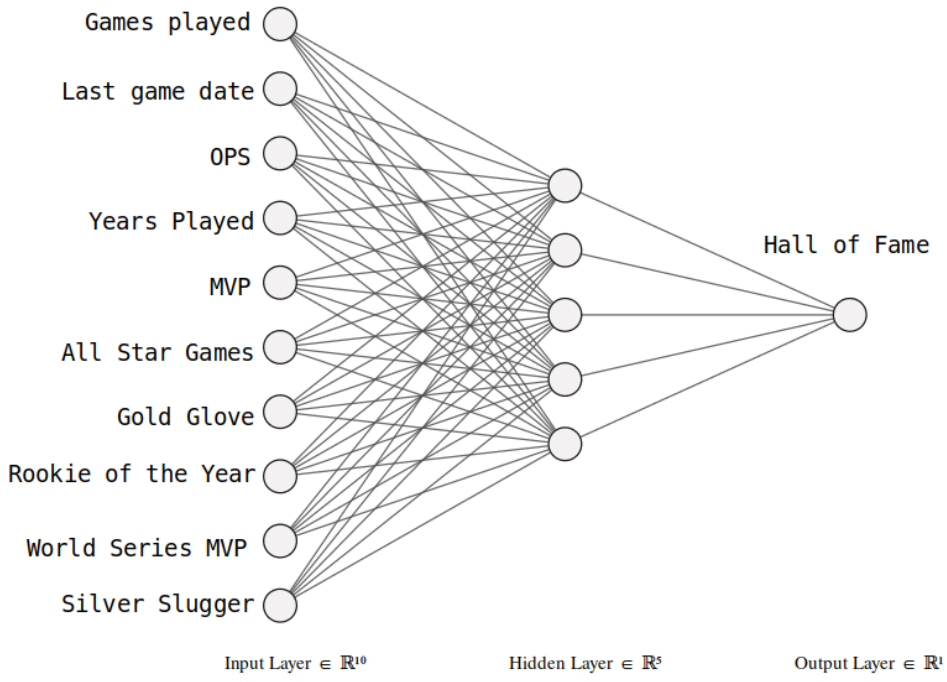
Dataset

- Sean Lahman's Baseball Archive[1]
- Imbalanced dataset:
  - 226 players in HoF
  - 3190 eligible players not in HoF
  - 14:1 ratio of non-HoF to HoF
- Hold-out split: Training 80%, Testing 20%
- Difference in quality features by positions
  - Good for batters (OPS, SLG, OBS, etc.)
  - Okay for pitchers (WHIP, K/BB, K/9, etc.)
  - Poor for other defense (FFRA, UZR, etc.)

[1] http://www.seanlahman.com/baseball-archive/

Model

- Depth: 3
- Width:
  - 10
  - 5
  - 1
- Activation:
  - ReLU
  - ReLU
  - Sigmoid
- Loss: Binary Cross-entropy
- Batch Size: 1
- Epochs: 50

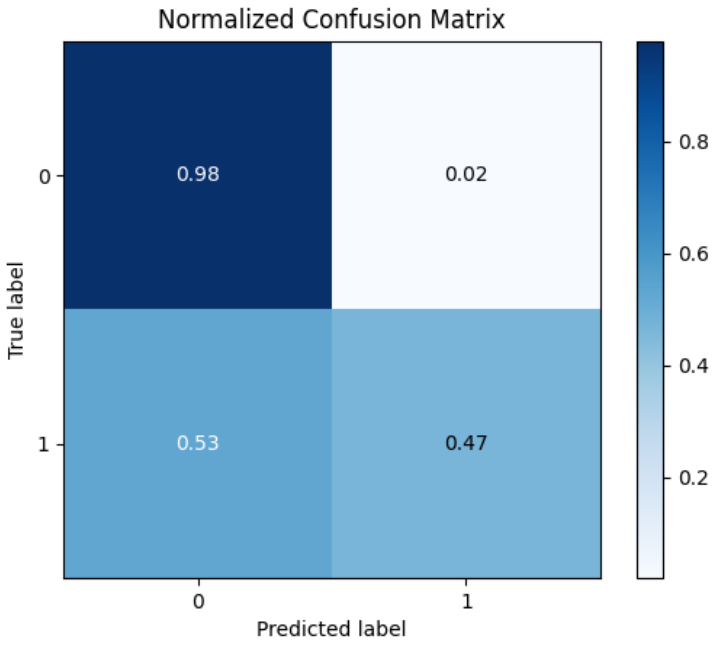


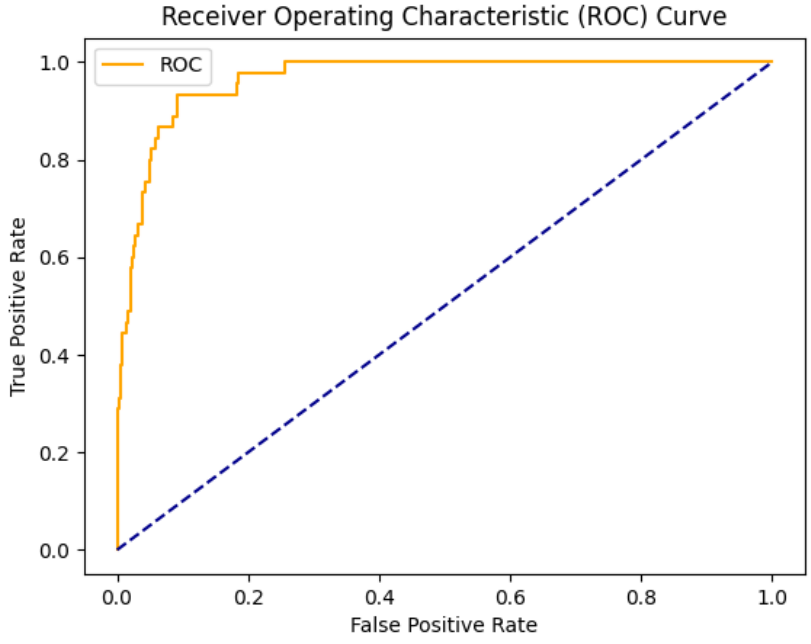
Implementation

- Fair amount of pre-processing
- Primarily used Keras and Scikit-learn tools
- Stratified 10-fold Cross-validation
- Final Test only done at the end.
- Handling and small imbalanced dataset:
  - Tried undersampling
  - Class Weights
  - Small Batch Size

Results

- Accuracy: 0.95
- AUROC: 0.73
- Precision: 0.66
- Recall: 0.47
- F1: 0.55





Thank you for your attention!