



Predicting Skill Level of Player based on Actions

Using Recorded Matches of Counter Strike: Global Offensive Games

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Business Understanding



Before the game starts, the players are matched with other players according to their **rank**.

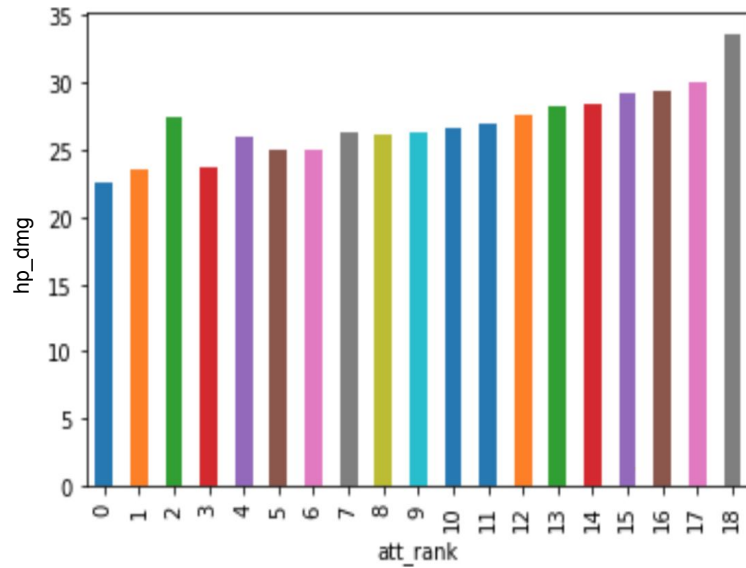
When a new player starts playing they don't have an assigned rank.

To provide the best **challenging experience** for new and old players it is necessary to get the new players rank as quick as possible to let them play against player of the same skill level.

Data Understanding

The dataset is composed of about 1 million entries and 33 attributes, we are going to use 5 of them.

- hp_dmg
- hitbox
- att_rank
- vic_rank
- avg_match_rank



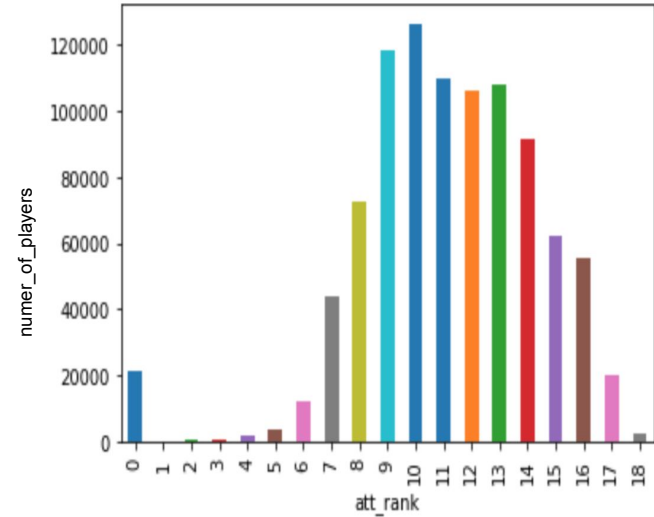
Data Preparation



- Conversion of categories of text values to numbers
- Normalization of all values
- Data randomization

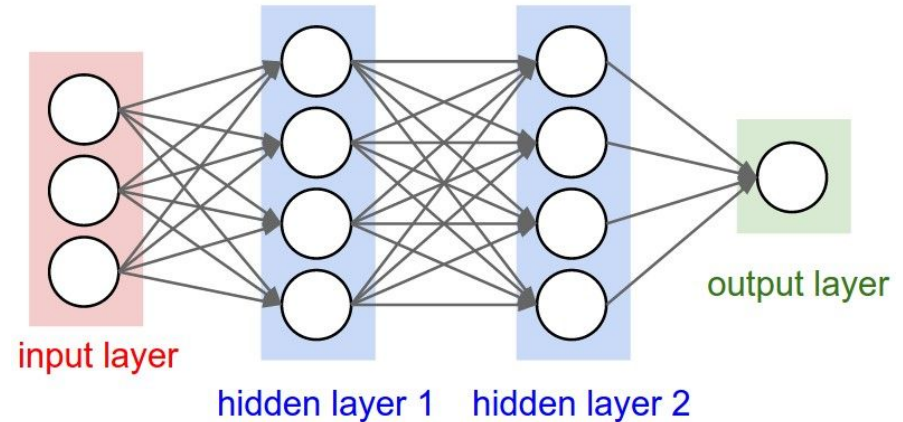
KNN

- Accuracy of 42% when trying to classify all 19 ranks
- Reducing output classes to three (low, mid and high skill level) ranks --> accuracy is now 84%



Neural Network

- Keras and Tensorflow
- Feedforward Network
- 4 Layers, 2 Hidden Layers
- 10-Fold Cross-Validation
- Trained on 700'000 Instances ~12 minutes
- ~84% Accuracy



Conclusion



- Most of the data has bad or no correlation to the player rank
- About the same accuracy with KNN and neural network
- Reducing output classes improved accuracy while still being valid for the business case
- Neural network takes more time for the training but is more faster for the prediction and this is what we want for evaluate new players.

Sources



Neural Network Image: <https://cs231n.github.io/neural-networks-1/>