Members: Ruyao (Anthony) Tian, Kaiyang Weng, Le Fan (Ethan) Fang

Topic: Using Data to Predict Powerlifting Progress

In the weight-lifting community, many aspiring lifters are often discouraged from resistance training because they see not enough progress. One way we want to alleviate that is by creating a strong strength prediction model, because an external, accurate prediction guides expectation; which tempers satisfaction, because expectation is more frequently met. By taking in past data collected on hypertrophic and strength responses to resistance training, we aim to create a model that lifters can use as a reference throughout their weightlifting pursuit, keeping them motivated and on-track.

Currently, our idea is to train a model to predict elements related to strength training, such as surpassing personal records and fatigue. Current dataset prospects include sets from OpenPowerlifing (https://www.openpowerlifting.org/) and four personal logbooks of the past two months' worth of training data, from a group member. Using these, we can hopefully find trends in progression and stagnation, which can teach a machine to predict when pacing of future strength gains.

With the OpenPowerlifing datasets in specific, which contain top powerlifters' record lifts and personal info, we can potentially predict someone's genetic potential in powerlifting based on their weight, age, sex, and race. Here, there's an opportunity for us to employ what we learn about machine-learning, as regression models are involved in prediction.

Ethical Considerations

One ethical consideration we have is data anonymization, as the current datasets we've found contain some personally identifiable, such as name, location, and even their instagram handles. Along with this, we also want to steer away from drawing conclusions about specific athletes (ex: athlete x's records over their career) as this crosses privacy boundaries.

Division of Labor:
Ruyao (Anthony) Tian:

-Directing team's guiding questions
-Synthesizing findings, analyses, and predictions
-Making findings presentable/digestible for an audience

Kaiyang Weng:
Capturing trends through visualizing data
-Cleaning + manipulating dataset(s)
-Putting our data visualizations into context

Le Fan (Ethan) Fang:
Will handle all things machine-learning related:
-regression models for predicting 1) strength progression and 2) fatigue
-classification models to differentiate progress and stagnation periods

Databases:
https://www.openpowerlifting.org/
Ruyao Tian's Four Training Logbooks