Micromotion

PREDICTION OF HEAD MOVEMENT
BASED ON PREVIOUS MOVEMENT
AND MUSICAL STIMULI

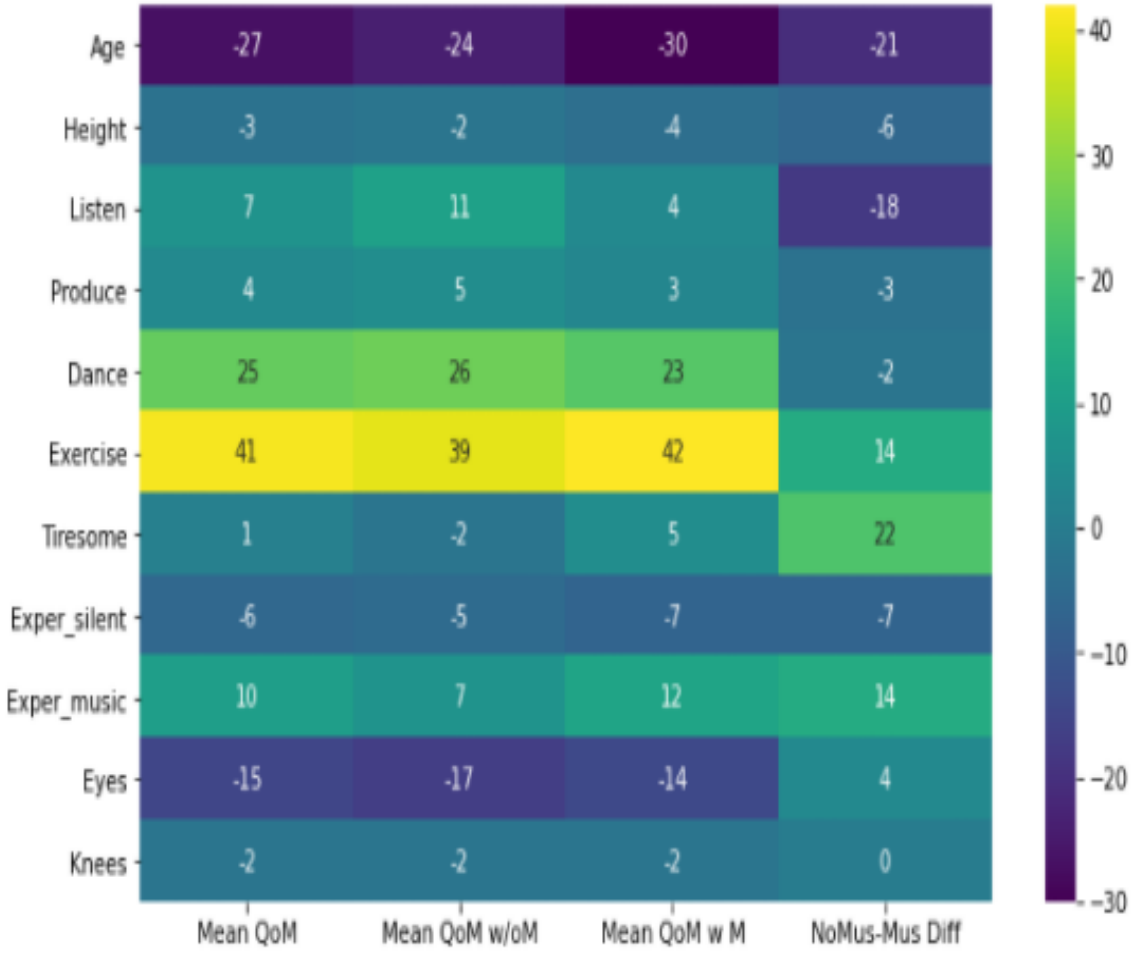
Problem Statement

- The project was based around data collected during a 2012 study conducted at the University of Oslo and resulted in a paper, Jensenius et al., "The Musical Influence on People's Micromotion when Standing Still in Groups", Proceedings of the 14th Sound and Music Computing Conference (2017).
- Can the collected data be used to predict the amount people will move when hearing different types of stimuli

Demographics

- Limited correlation to amount of movement

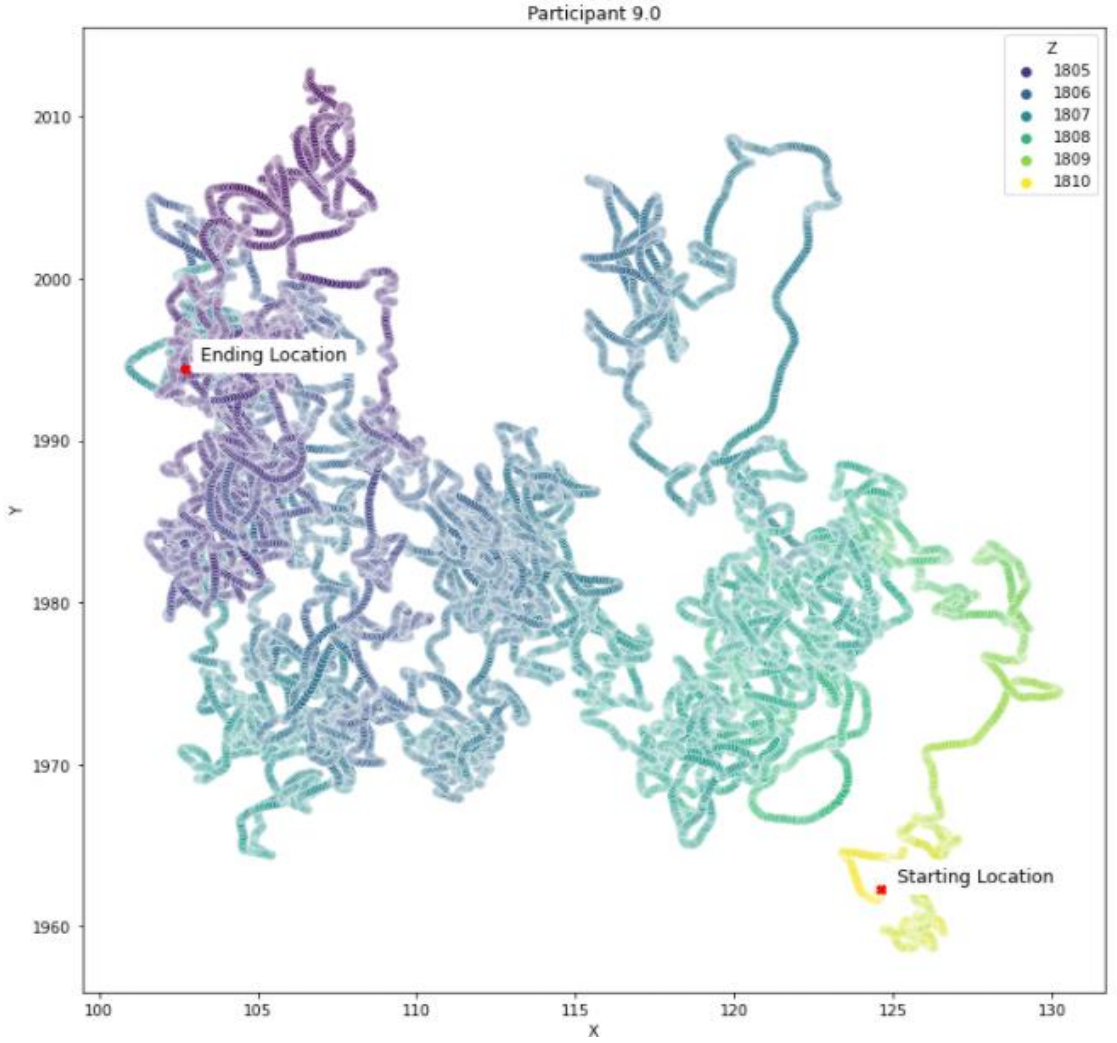
- Removal of ex-post data



Motion

- Visual looking down at top of head

- X – left to right, or side to side
- Y – front to back
- Z – height represented by color with lighter being higher and darker being lower



Musical Stimuli

- Lento (#3) from György Ligeti Ten Pieces for Wind Quintet (20s)

- Allegro con delicatezza (#8) from György Ligeti Ten Pieces for Wind Quintet (15s)

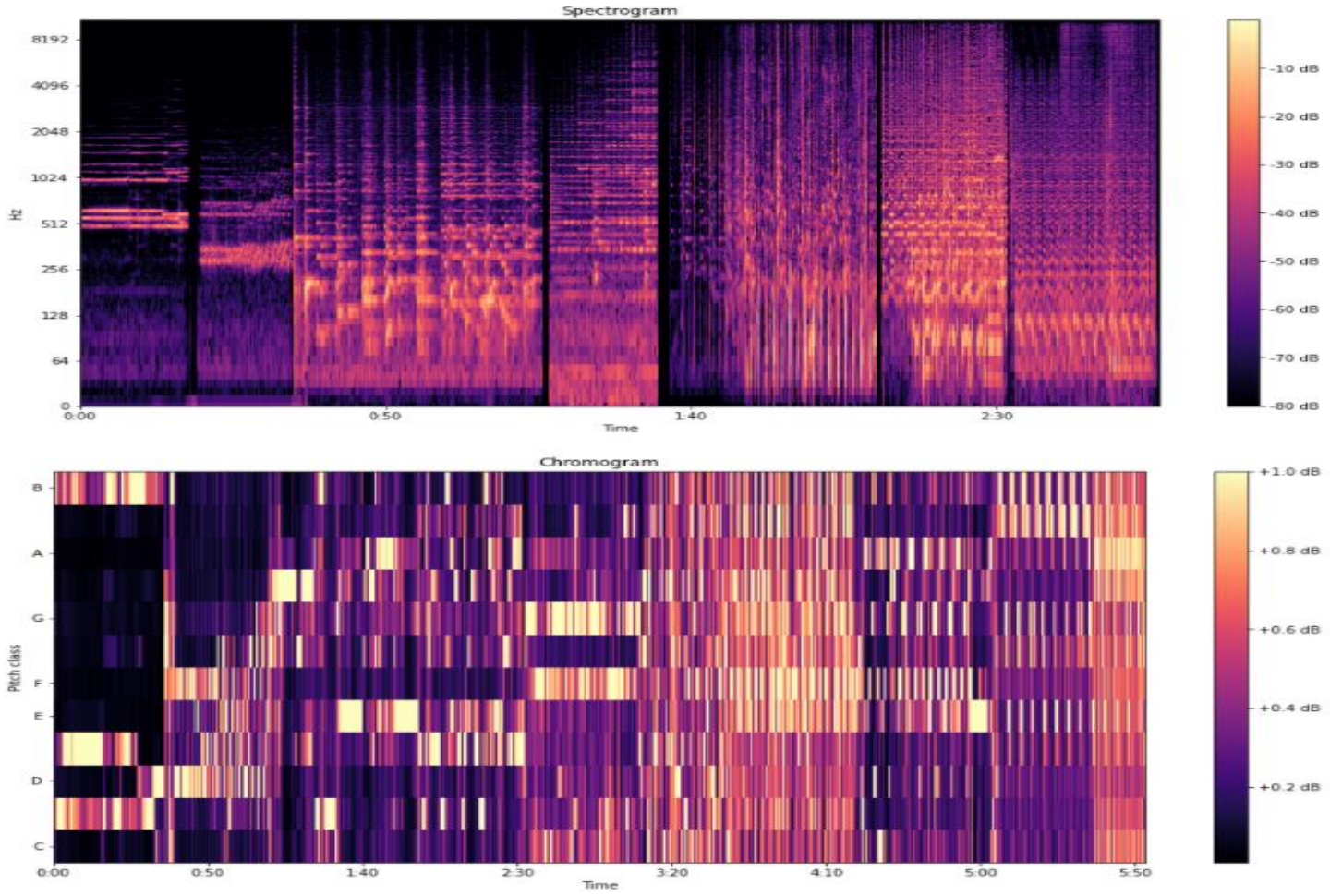
- Adagio from Joaquin Rodrigo's Concierto de Aranjuez (40s)

- Winter movement from Vivaldi's The Four Seasons (20s)

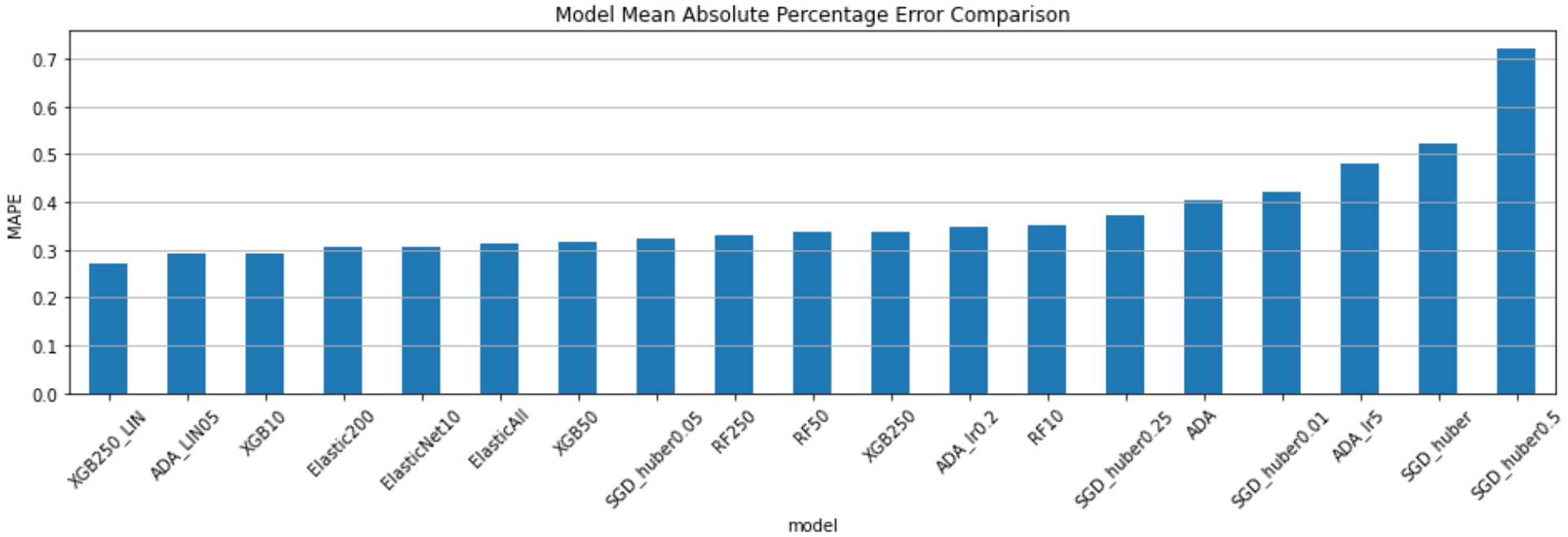
- Left & Right by D'Angelo, featuring Method Man & Redman (35s)

- Marcando la distancia by Manolito y su trabuco(20s)

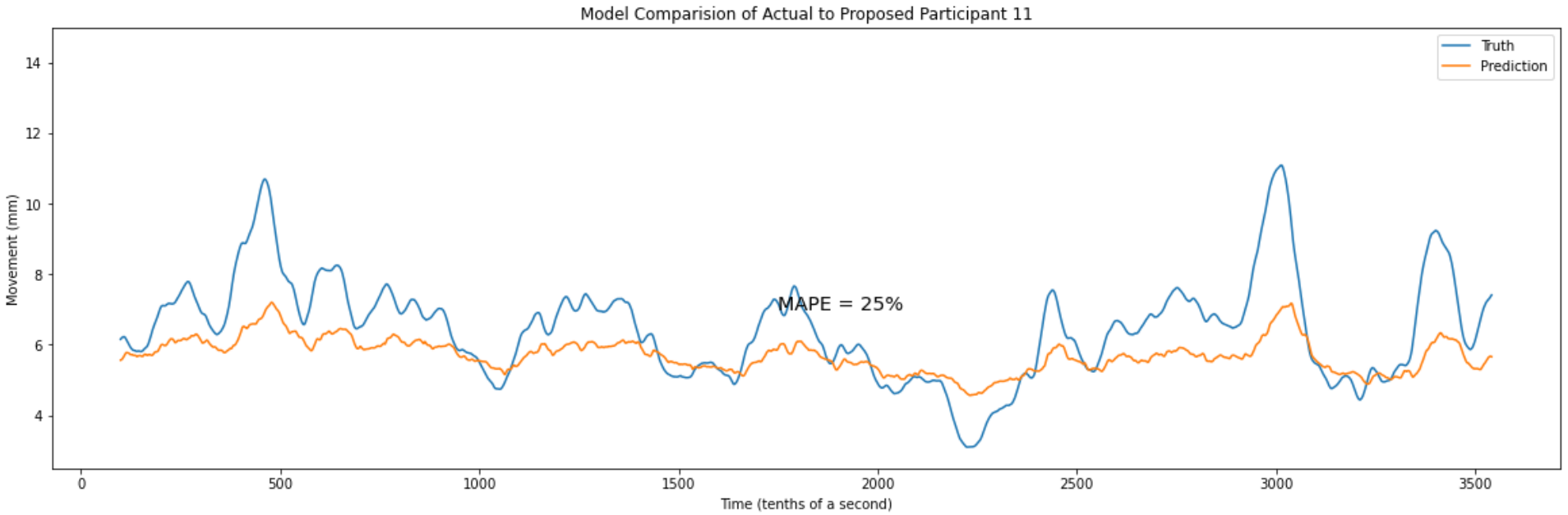
- Cubic by 808 State (30s)



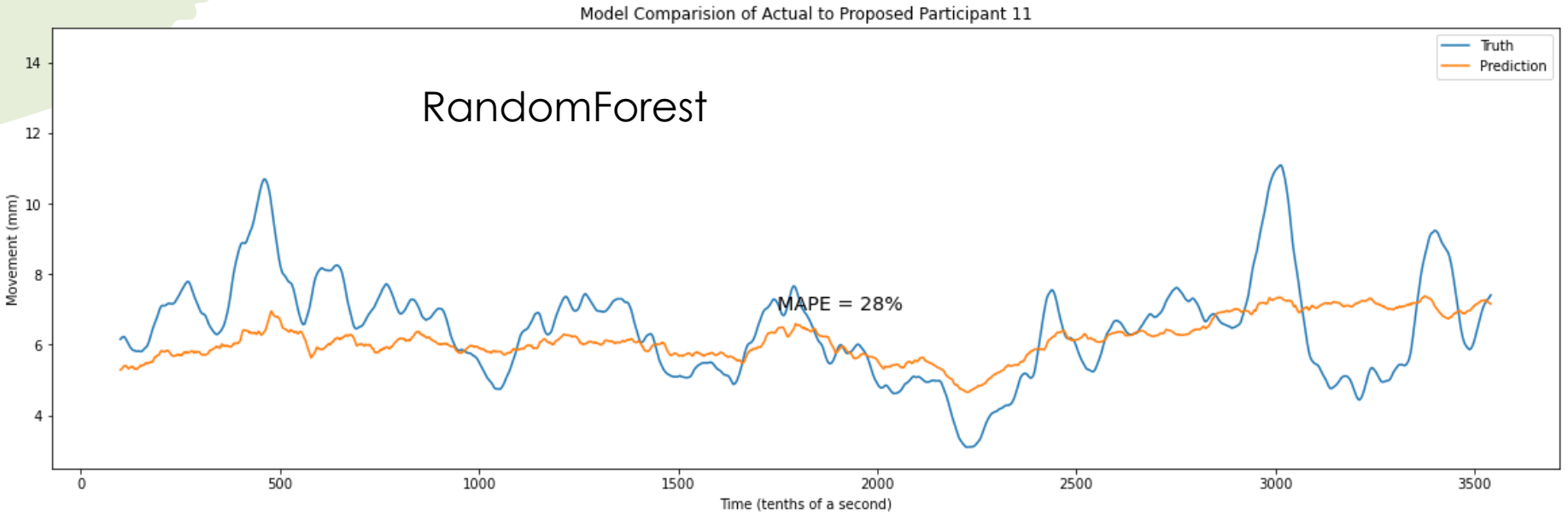
Model Performances

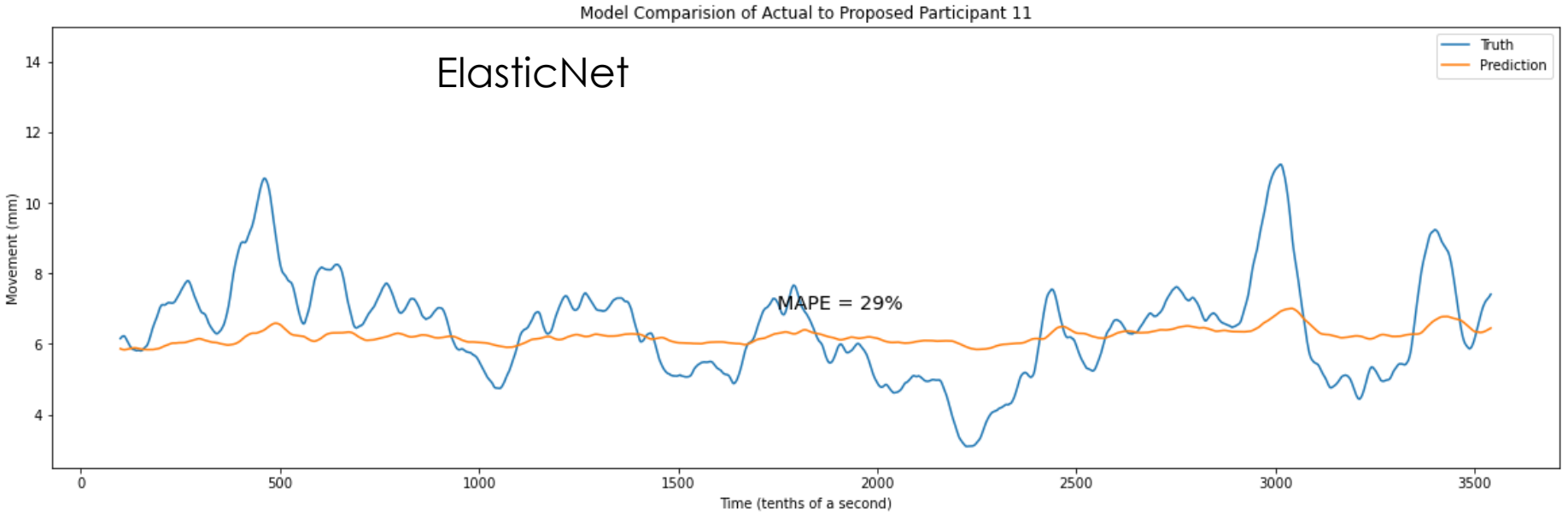


XGBoost Regressor – 250 Estimators – GBLinear Booster

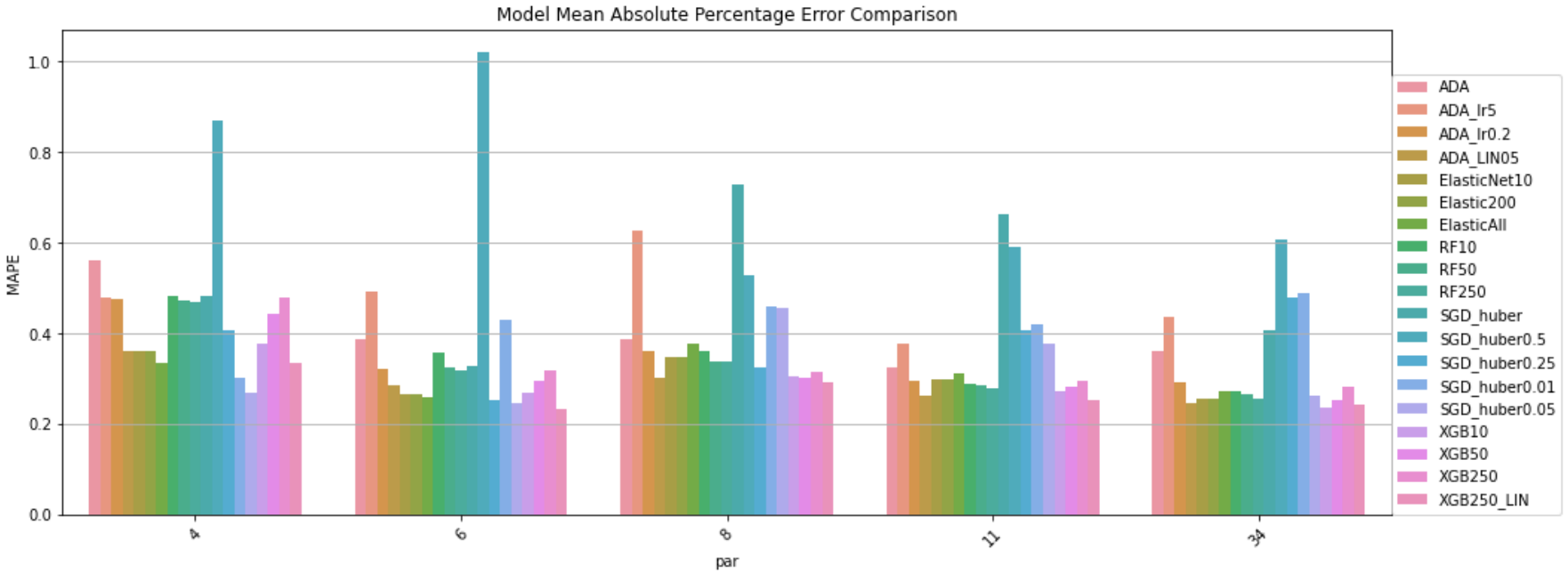


Linear Model Vs. Tree Based Model





Participant Model Performance



Conclusions

- Linear models performed better on a metric basis

- Tree based models better caught the amplitude

- Different lines of inquery are still available for study such as:
    - Men vs. women
    - Types of music (segments) broken out
    - Training on data from 2/3 of participants fully and testing on remaining