

Using Machine Learning to Improve Teamwork



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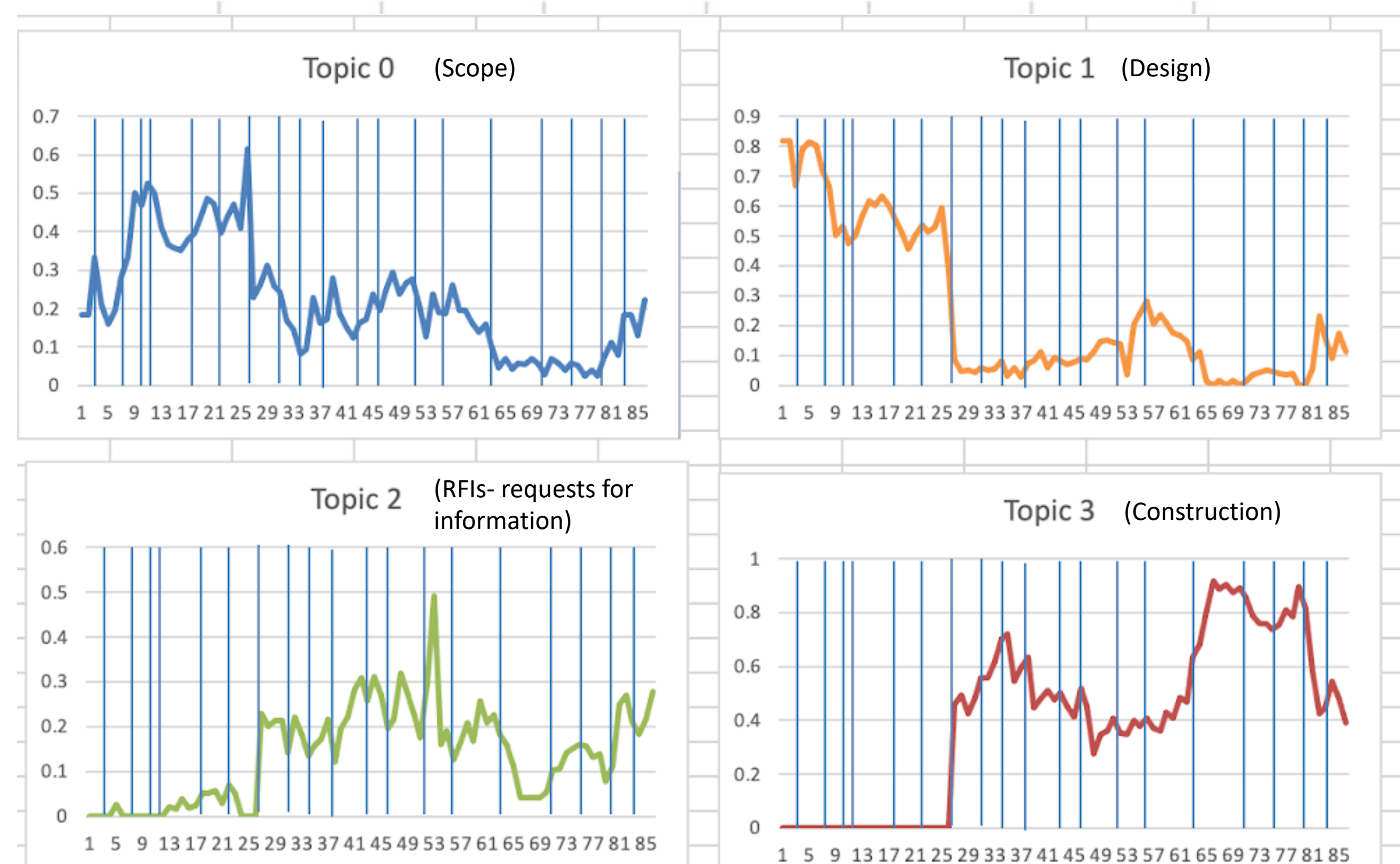
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Acknowledgement: This work was supported by NSF ACRES REU - OAC-1949912

BACKGROUND: When working in a team, proper teamwork and communication can have a major impact a team's success and efficiency in reaching a goal. This project aims to use machine learning to analyze team interactions and identify interventions that can be used to improve teamwork.

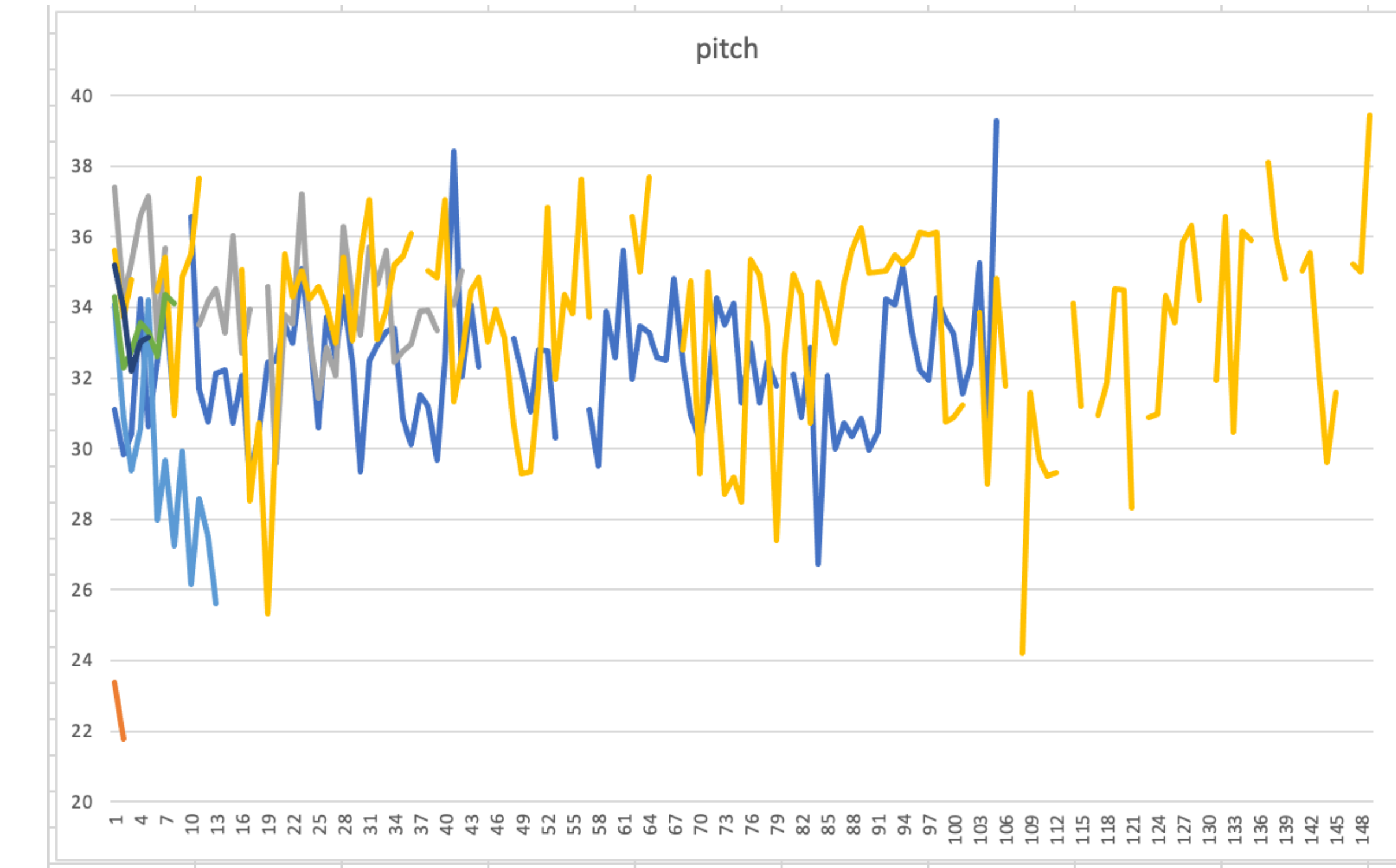
METHODS/RESULTS

1. Collected meeting videos, email correspondence, and demographic information from 4 construction teams and 18 student teams
2. Transcribed the meeting videos and used machine learning to do topic modelling on meetings, and analyzed topic importance over time

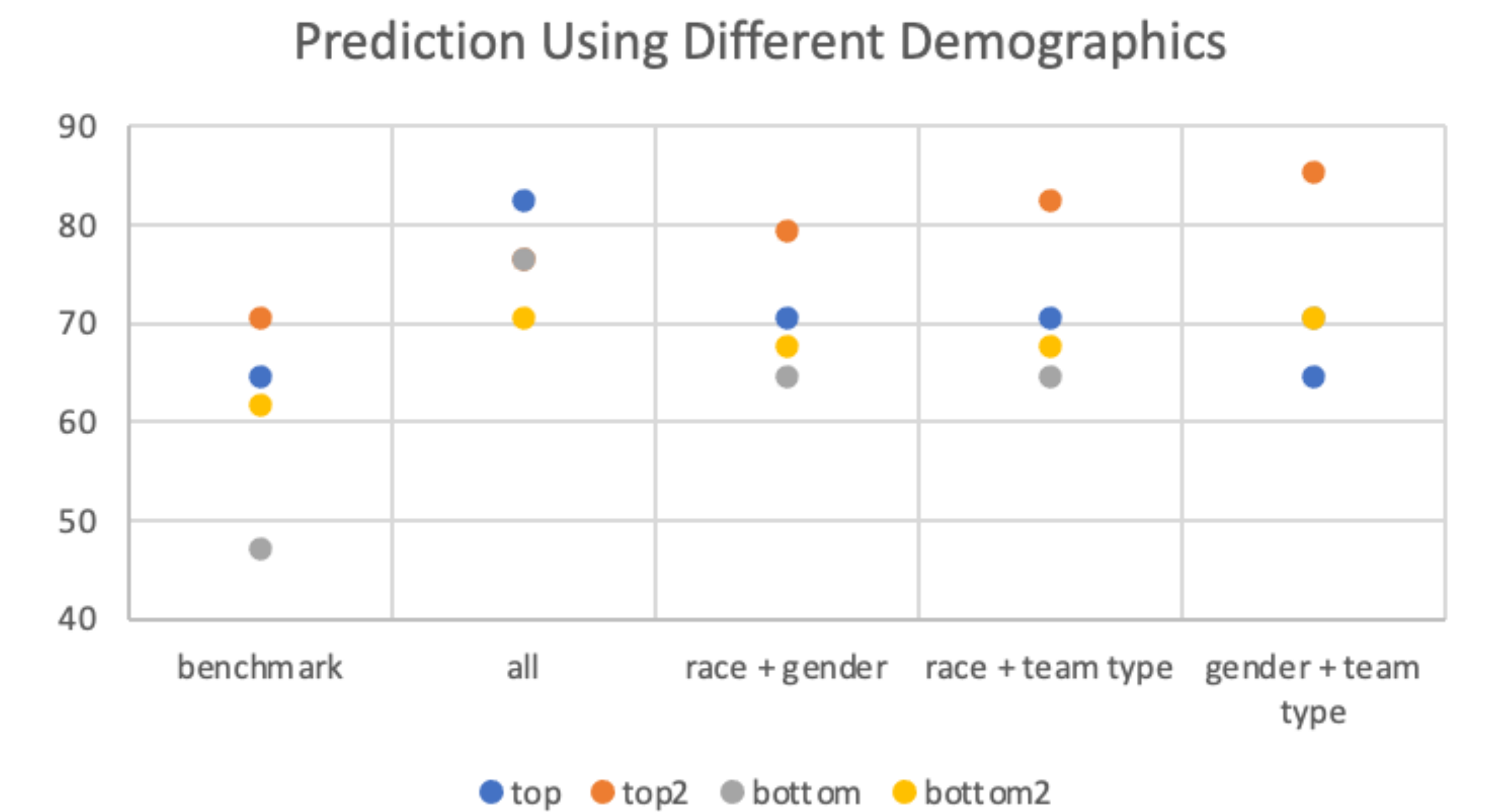
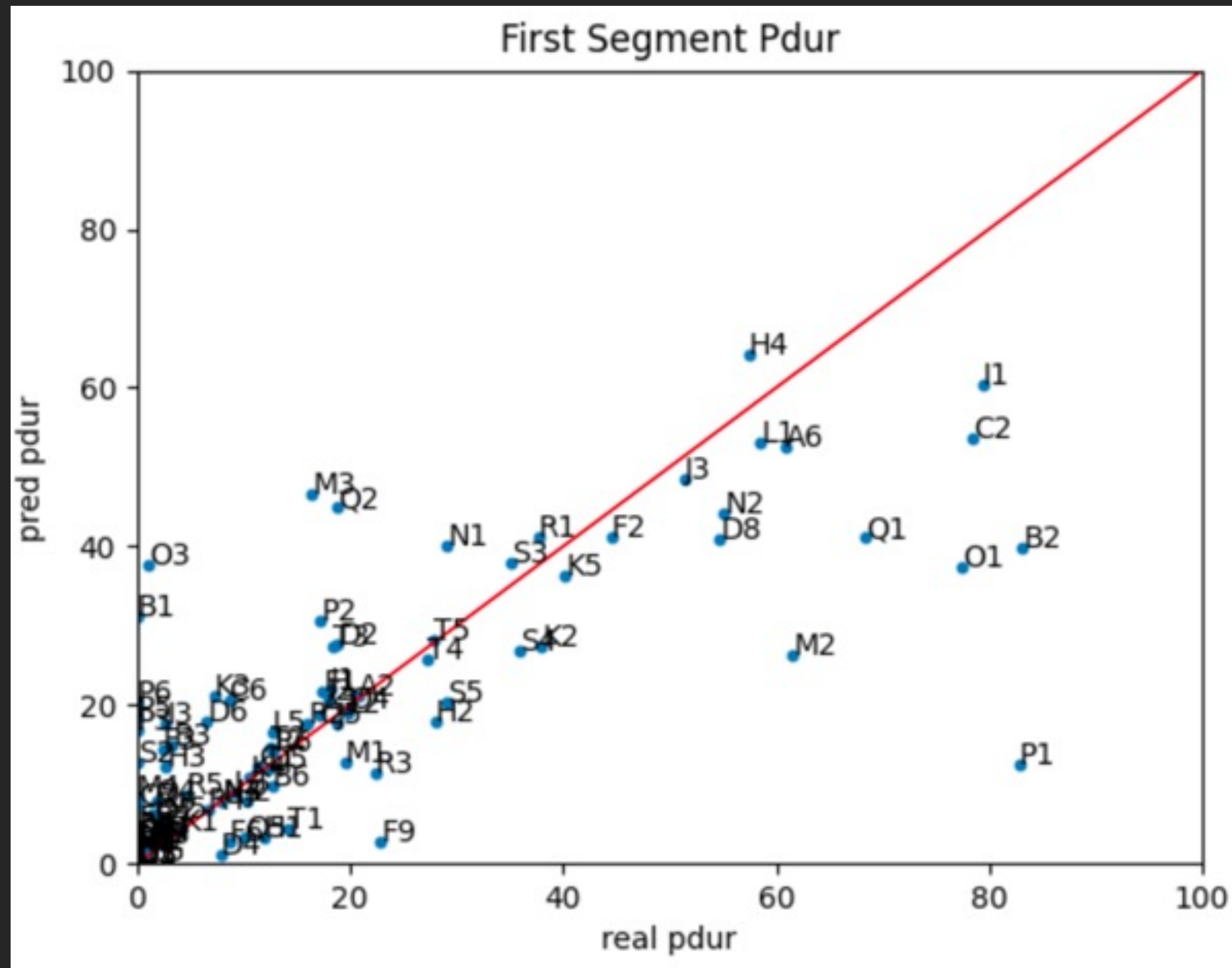


Machine learning can be used to predict future team engagement based on just 10 minutes of team interaction

3. Conducted 3 groups of analysis for each sentence in each meeting: sentiment (positive/negative), GAO (giving/asking/other), and prosodic features (pitch, jitter, shimmer, harmonics-to-noise ratio). We analyzed features over time



4. Used speaker diarization to quantify how much each team member contributes to the meetings by pdur (percent speaking duration)
5. Trained a machine learning neural network model to predict future team member engagement by pdur, including the most active and least active speakers
6. Tested ML with different combinations of demographic data and compared against the benchmark prediction of assuming pdur stays constant across meetings



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