Week 5 - HMI Research Group

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Long Phi Nguyen (뉀피롱), 한국전자통신연구원

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Summary

A new Python script/class was created to analyze motion from NAO's sensors. New, natural movements have been successfully generated.

Points

- Started over and collected 10,000+ sensor data reports from NAO (running on `webots`)—this data included `BodyTalk` gestures, which are meant to be used when NAO speaks casually, and `Emotions/Negative` gestures.
- Wrote a class that uses `numpy`, `seaborn`, and `naoqi` together to provide analytics and functional behavior for NAO's sensor data. This class plots sensor values with a kernel density estimate to indicate joint positions that NAO often has when performing certain types of gestures. By sampling random values close to the mean (± standard dev.) of NAO's joints, it generates new motions.
- Generated motion works beautifully for NAO (`BodyTalk` category). Motions are smooth, and each is entirely new.

Plans

- Clashing sensor distribution data from `Emotions/Negative` gestures causes NAO to fall down when generating new movements—need to fix this; new motions sampled from `BodyTalk` are fine.
- Analyze all the other subsets of gestures—currently only done with about 50/600+ gestures.

Addendum

Again, all progress made can be found `here`. Plots from the sensor data analysis can be found `here`.