Week 7 - HMI Research Group

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Long Phi Nguyen (뉀피롱), 한국전자통신연구원

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Summary

A *huge* bug was found when going through the codebase this week: this whole time, wrong sensor names were being assigned to angle/data points. NAO only fell down because of this, and it explains weird animations being triggered when trying to replicate motion with collected data.

Points

- Reread the low-dimensional embedding paper and experimented with Python package `GPy` (Gaussian process modeling package).
- Reparsed sensor and data correspondence and finally debugged NAO falling down.
- Wrote an $O(n)$ algorithm incorporated into sensor data collection to bridge data points by intervals of 0.3s. These points can then all be interpolated sequentially with 0.3s transitions to replicate the original movements.
- Tested original method of statistical sampling within the mean by a standard deviation—movements are fine now and replicate original Aldebaran gestures well, but with their own exaggerations for natural effect.

Plans

- Need to determine a way to sample a trajectory and map it back to 26-dimensional space to generate new motions while preserving old trajectory sequences.
- Refactor `nao_script.py` and `motion_analyzer.py` together into a new, modular class, preferably derived from `naoqi`'s `ALModule` class.

Addendum

The repository can be found `here`. Time series plots for gestures from `BodyTalk` were redone with the correct sensor relations and can be found `here`.