Week 4 - HMI Research Group
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Summary

A fully modular speech program was completed for NAO and can classify/predict user inputs, adding one gesture for NAO to perform as he speaks the text. Data was gathered from NAO's body sensors and converted to feature vectors.

Points

- Looked at the NAO API and learned how to use `ALBehaviorManager` to track NAO's behaviors during runtime and `ALMotion` to gather sensor data.

- Parsed NAO's motion (see previous point) data to tabulated data involving stiffness, command, and sensor attributes. Converted this data to 5406 feature vectors classified under the 9 groups established in earlier work.

- Trained a multilayer perceptron with an average of 80%+ accuracy on training data during cross-validation (only 5000 samples).
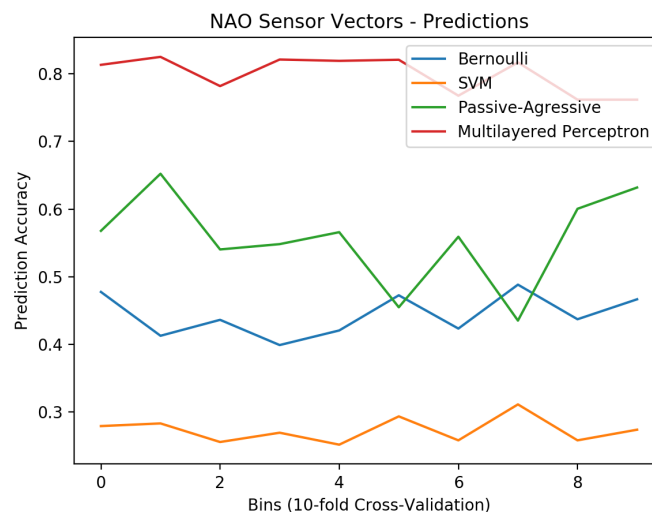
- Set up Webots and Choregraphe together. Installed 636 behaviors for the simulated NAO—data analysis still supported.

Plans

- Find some way to go backwards from the model to generate new movements/gestures that stay true to their classifications as NAO speaks.

- Learn how to use `ALMotion`'s other functions to manually control NAO's physical movement.

- Collect hundreds of thousands of new motion feature vectors from the simulated NAO for more accurate training.

- Find any other ways to gather data regarding NAO's sensors and spatial information.

Addendum

All past progress (functions, scripts, etc.) and data made on this project can be found at `https://github.com/longnguyen1997/nao_animations`.