Head pose and eye gaze estimation for human-robot interaction

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Intro

What’s this presentation about? Use this slide to introduce yourself and give a high level overview of the topic you’re about to explain.

Overview

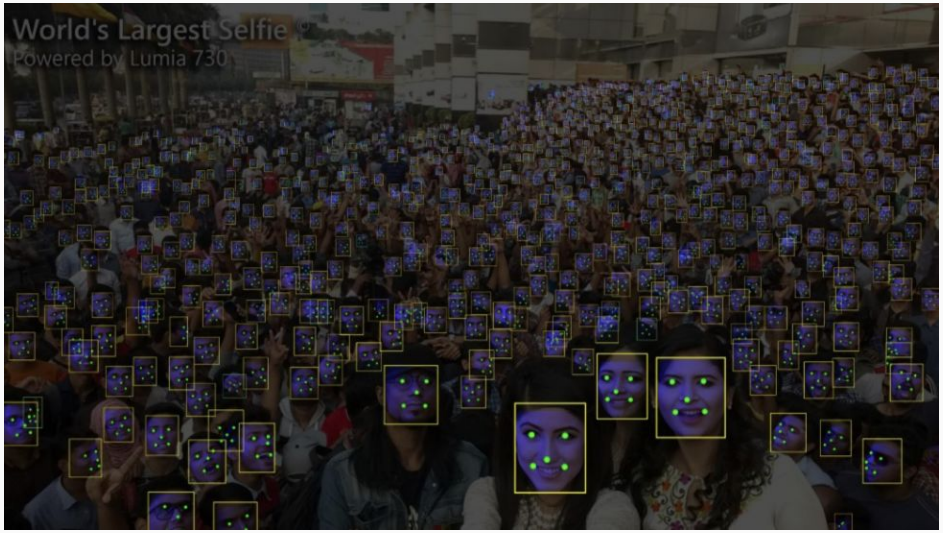
Eye gaze estimation is an important communication cue for successful interaction (human-human, human-robot).

In robotics, head pose is often used as a good approximation, since predicting eye gaze is a lot harder.

The main goal is to use neural networks to read the direction of humans eye and combine it with head pose estimation models to create a way for the NICO robot to understand where the person it is communicating with is looking.

What has been done

- Researched similar papers.
- Researched neural networks image processing and computer vision in general.
- Used 6DRepNet and RetinaFace models to find faces on the picture, find eyes and predict head pose.



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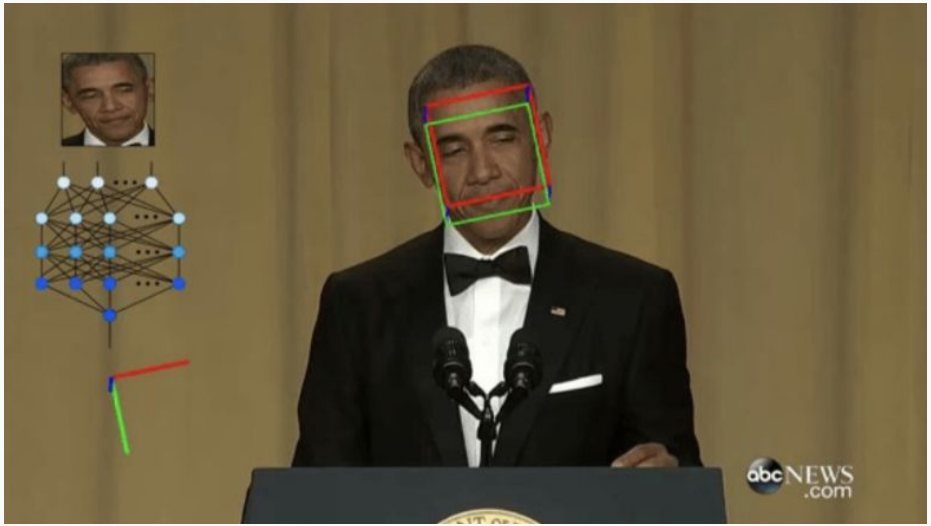
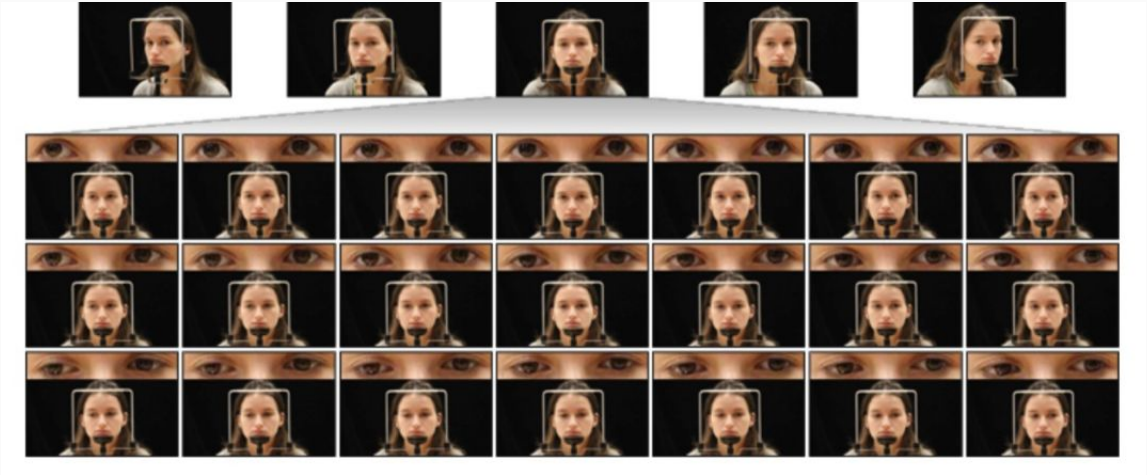


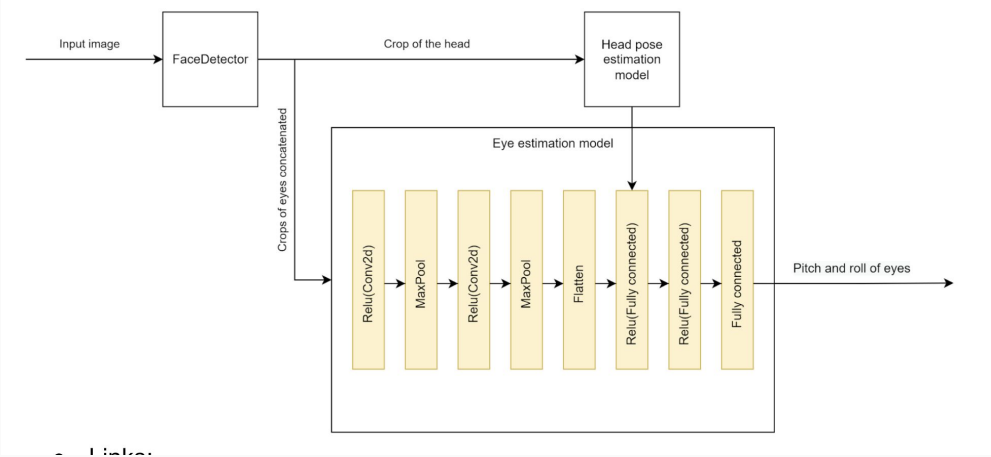
What has been done

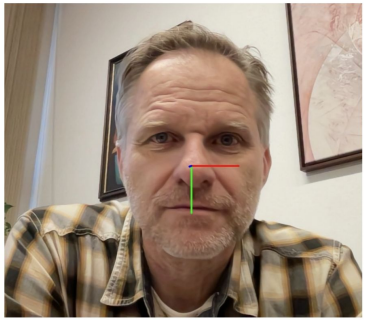
- Found Columbia gaze dataset.
- Created first model for eye gaze estimation.
- Optimized hyperparameters.
- Got to MAE 1.7

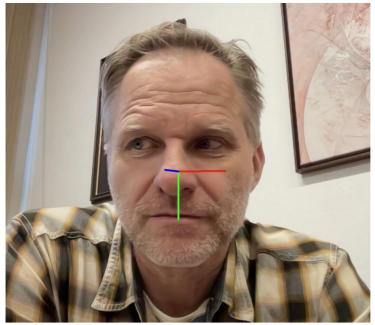


What has been done

- Model tested out with the robot







To-Do

- Cross validate results from the models.
- Use meta human to create an artificial dataset.
- Do a comparison of the results from real dataset vs the artificial one.
- Write a thesis.

Thanks!