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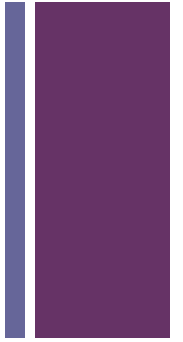


Kathy Yu

Stepping Shop | Team 5

+ Status Updates

- Understood the Cartesian plane of the Xtion Pro
- Project is portable, due to SSH
- Produced a graphical outline of basic body shape, movement and depth. (That is Sairam down there).





Test Case I

■ Requirement

- Timing & Reproducibility

■ Use Case

- Differentiating a dominant hand from other objects on screen
- How fast is the hand recognized

■ Metric

- Specificity & Sensitivity
- Time taken for hand recognition

■ Test Sequence

- 1) Place hand in front of Xtion Pro
- 2) Box appears roughly around hand on screen
- 3) Move hand off camera
- 4) Repeat with varying people, distances, and orientations

■ Configuration/Deployment Issues

■ Known Problems

- Currently box is drawing around largest object on screen
- If person is too close, Xtion Pro throws errors



+ Experiment Description I

- Hypothesis
 - Can recognize dominant hand in multiple environments
- Test Setup
 - Project components + 1 human
- Metrics
 - (x,y) center position of the box on the screen
- Workload
 - Only one hand ever
- Parameters
 - Size of hand, orientation, distance of hand from camera
- Test run
 - Kathy places right hand in front of the screen and a box draws around it. Vary the distance from camera but keep palm facing camera
- Experiment
 - Distance from camera (in), length of hand (in), number of runs, percentage of accuracy, how long it takes for hand recognition (s), minimum, average, and maximum times of recognition



Test Case II

- Requirement
 - Reliability & Timing
- Use Case
 - Screen is responsive to user movement
 - Regression testing
- Metric
 - Specificity & Sensitivity
- Test Sequence
 - 1) Place hand in front of Xtion Pro
 - 2) Move left, right, up, and down
 - 3) Repeat with varying people, speed and direction sequence of hand movement
- Configuration/Deployment Issues
- Known Problems
 - None, not implemented





Experiment Description II



- Hypothesis
 - Screen moves with respect to hand movement at all times
- Test Setup
 - Project components + 1 human
- Metrics
 - How fast it takes for the screen to respond
 - Direction taken by screen and how much
- Workload
 - Only one hand and direction at a time (e.g. cannot move up and left simultaneously)
- Parameters
 - Direction and speed of hand
- Test run
 - Vary hand direction but keep speed constant
- Experiment
 - Distance from camera (in), number of runs, percentage of accuracy, movement speed of hand, direction of hand movement, how long it takes for screen to respond (s), minimum, average, and maximum times of recognition



Reproducibility and Automation



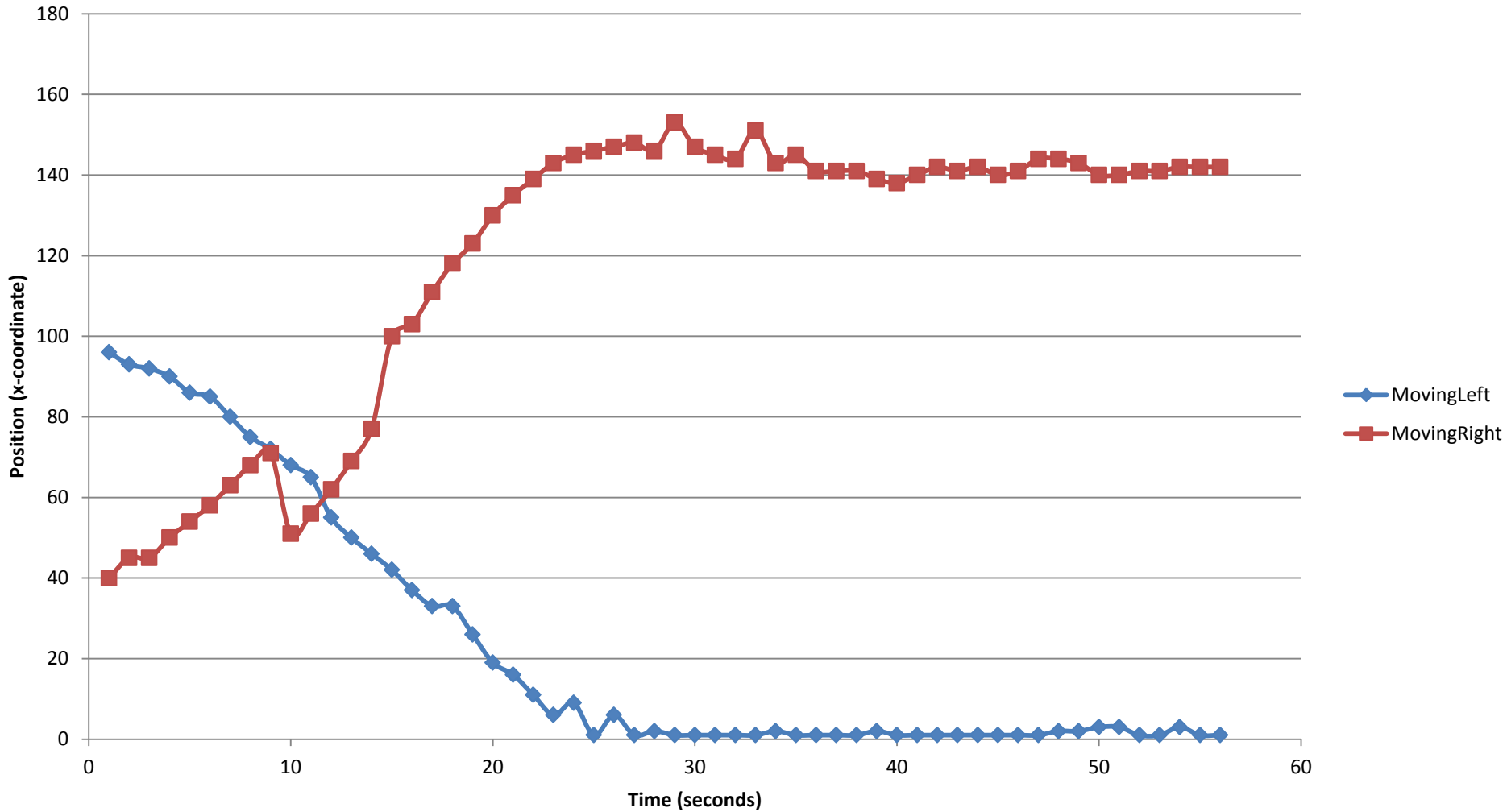
- Test Case I and II results can be reproduced with the same person, distance from camera, and hand motions.
- However, these tests cannot be automated because visual confirmation is needed.



Initial Results



Horizontal (X) Position vs. Time

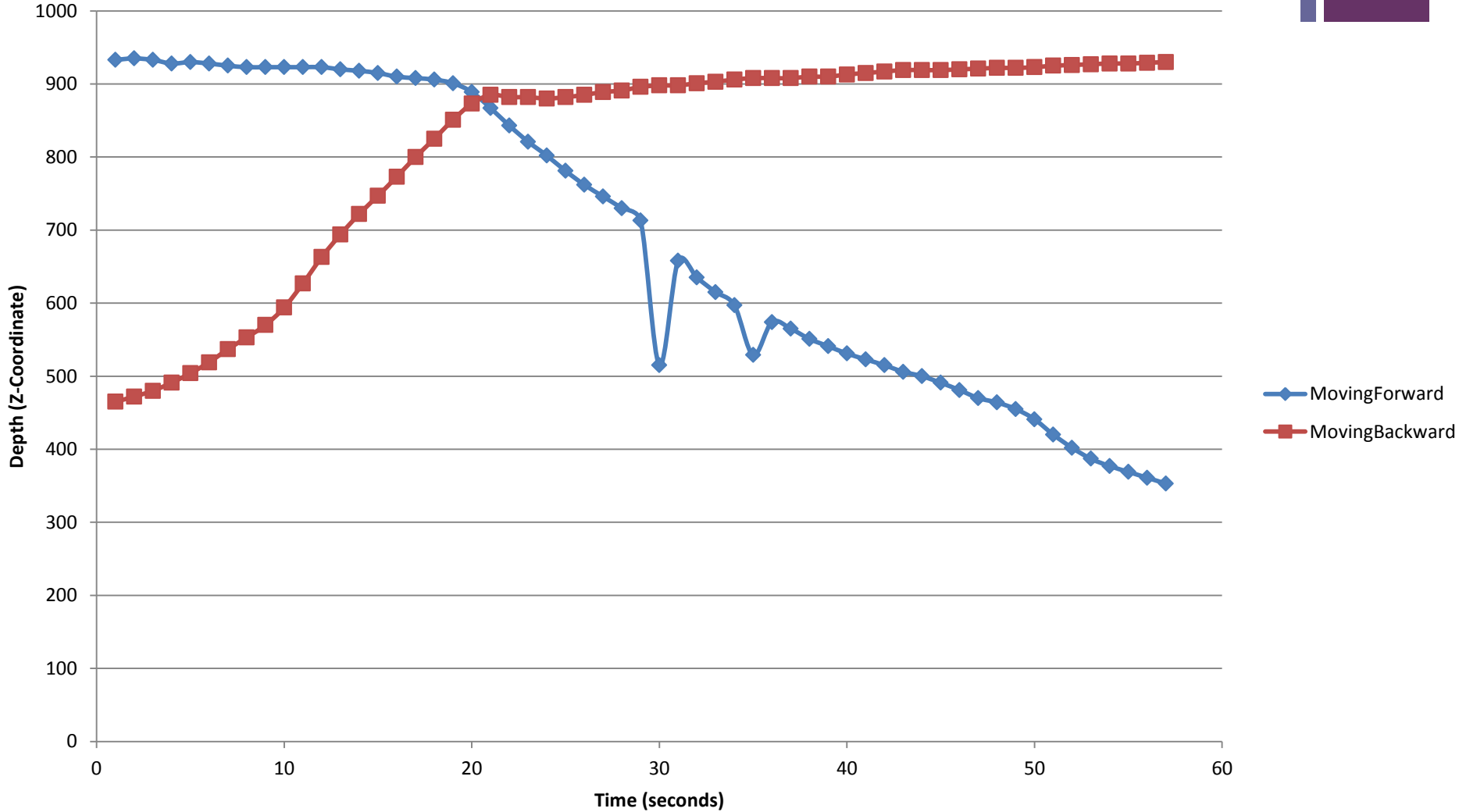




Initial Results



Depth (Z-Coordinate) vs. Time



+ Progress

- What have you learned so far?
 - We figured out which module is best suited for our project, not to trust open-source embedded boards, how to best divide up the project, and work as a team.
- What's next?
 - More specific hand recognition, with the help of a free SDK found online and simple scrolling of pictures on a monitor with left and right hand movement
- How do you plan to spend the rest of the semester in this project?
 - Completing hand recognition with screen movement
 - Testing for reliability and timing on users
 - Refining project according to test results and user experience for final demo





Questions, Comments, Concerns?

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