Presentation Video

Video Link:

<https://youtu.be/lfax5g83UvQ>

Video Script

# Slide – Cover – Vince

(5 Seconds)

Hello everyone. Today, we are thrilled to present our collaborative journey on the DoBot Robot Hand-Eye Calibration project.

# Slide – Meet the Team – Vince

(10 Seconds)

I’m Vince and along with my teammates Seb and Britney, we will be walking you through our experience traversing this project.

# Slide – Group Project 4 – Seb

(15 Seconds)

The team was assigned the task of completing Group Project 4, which aimed to calibrate the relative pose between the camera end effector, pattern end effector or robot base-global RGB-D sensor.

# Slide – Project Brief – Seb

(20 Seconds)

By completing the project, the team aimed to bridge the gap between perception and action by achieving precise hand-eye calibration between a mounted camera (eye) and the DoBot Magician’s end-effector (hand).

# Slide – Project Plan – Seb

(15 Seconds)

The team crafted a detailed project plan outlining our milestones, tasks and individual responsibilities. This plan evolved as the team's understanding of the project developed.

# Slide – Methodology – Vince

(15 Seconds) Read the slides

Maintaining foundational elements, the team employed the following methodology outlining extensive research into calibration techniques while conceptualising project requirements, simulating robot movements, physical data collection, and calibration.

# Slide – Experiments - Seb

(20 Seconds)

Before working with the physical robot, the team conducted simulated work utilising MATLAB and elements of the Peter Corke Robotics Toolbox. This simulation phase aimed to comprehend the DoBot Magician’s work environment and identify valuable poses crucial for calibration.

# Slide – Physical Hand-Eye Data Collection – Vince

(10 Seconds)

We then performed data collection with the physical DoBot robot and a strategically mounted camera that observed the positioning of the checkerboard pattern.

# Slide – Calibration – Britney

(15 Seconds)

The calibration results were achieved closely following the resources and steps provided in Canvas. Such steps involved converting the image file extension to .jpg file types, extracting the grid corners of the checkerboard pattern in the images and calibrating the camera.

# Slide – Conclusions and Recommendations – Britney

(30 Seconds)

To conclude, this project aimed to calibrate the relative pose between the camera end effector, pattern end effector or robot base-global RGB-D sensor as provided by the task. The project team achieved success in this task by completing a dedicated project in DoBot Robot Hand-Eye Calibration. We achieved research endeavours, simulations, data collection and calibration to obtain results.

In future works, this project could be improved by including code that automates the pattern corner extrapolation process. Including this process will decrease the requirement for user input and minimize the overall calibration time.