**Research Questions**

1. Research Questions
2. Can vision-based control systems replicate real-time human arm movement compared to traditional input devices?
3. Can the combination of VR and hand tracking give the user a better understanding of the robot's environment compared to a simple screen and controls?
4. Will there be challenges in applying these systems and machines to different situations, as well as training those who have used an old system for so long
5. Research Objectives
6. The development of a vision-based system capable of tracking and replicating human arm movement in real-time.
7. Comparing the performance and user experience of gesture-based systems with traditional controllers.
8. Conducting usability testing to assess accuracy, latency and responsiveness.
9. Analyse limitations and potential improvements
10. Research Philosophies, Approaches and Paradigms

The philosophy that was chosen is Interpretivist, which supports the understanding of the user experiences and the effectiveness of the technology. A deductive approach will be used to test hypotheses taken from existing theories. The reach paradigm will utilise a mixed-methods framework, using both qualitative and quantitative data.

1. Chosen Methodology

The methodology used in the experiment will be mixed-methods. This involves using both qualitative data from the program and output, and quantitative data by using questionnaires.

1. Chosen Methodology and Design

The research involves studying results acquired from a program designed to capture human arm movement through the use of a vision-based camera system and replicating it using a robotic or digital arm. The user will have their hand in front of a camera and have their hand movement tracked and copied onto a digital or robotic hand. To test the difference, a test will be conducted between vision-based control and traditional control methods.

1. Reflections on Validity, Reliability and Generalizability
2. Validity: Using real-world scenario testing and standard evaluation methods.
3. Reliability: Repeated testing through different environments and scenarios
4. Generalizability: These results can then be used a data for domains such as prosthetics, VR or hazardous environment operations.
5. Ethical Considerations
6. Informed Consent: The participants will be fully informed of the purpose of this study and procedures.
7. Data Privacy: Collected data will remain anonymous and stored securely
8. Participant Safety: The participants will be kept at a safe distance, and wearing safety equipment is necessary
9. Bias Avoidance: There will be no bias in diversity during the selection phase.