Geometric Relationships of Points in 3D Space

Over the past weeks, significant progress has been achieved in understanding and applying concepts related to the geometric relationships of points in 3D space. This study encompassed both theoretical research and practical implementation, with a particular focus on micro-assembly processes and robotic system integration.

During this period, I familiarized myself with the principles, challenges, and objectives of micro-assembly in optical systems. I conducted a literature review on CAD-based control interfaces for micro-assembly, gaining insights into improving accuracy and efficiency in robotic systems. Additionally, I developed technical skills by learning to operate Windows Subsystem for Linux 2 (WSL2) and installing and configuring ROS2 Humble on both Windows and Ubuntu platforms.

I set up a ROS2 project, integrating key packages such as `match_pm_robot`, `ros_assembly_manager`, and `ros_sequential_action_programmer`, and performed testing to ensure compatibility and seamless communication between components. Furthermore, I developed a Python function to calculate the position and orientation of a "restricted coordinate system" in 3D space based on geometric relationships, with plans for its integration into `ros_assembly_manager`.

The scholarship has had a positive impact on my research, allowing me to focus on deepening my knowledge and refining my technical skills, which has contributed to the overall success of the study.