

SUMMARY

In this thesis, a goal to create an extended reality environment for the purpose of learning and practicing robotic kinematics was set. An overview of the growth potential, current uses, benefits and weaknesses of these technologies were analyzed, and the conclusions of their use were pointed out. Additionally, a background of robotics was analyzed, and the current uses for these. The step by step process to achieve this goal was followed. The prototype of the extended reality environment was successfully developed, with the integration of previous projects [3], [4].

The results of this work will provide students and robotics enthusiasts to practice their knowledge and test their understanding of this subject in a safe environment, providing visual aid without the need of physical models of the robots.

As for future developments:

- Integrate the ROS communication and digital twin connection for the Yaskawa Motoman GP8 robotic arm.
- Improve the FK solver.
- Implement other robotic kinematic exercises such as calculation of Jacobian matrices.

To conclude, the author sincerely hopes that this work will aid the users to better understand the kinematics of robotic arms in a safe, fun, and practical environment