

AI Powered “Smart” Robotic Teammates

FSU

UNDERGRADUATE RESEARCH
OPPORTUNITY PROGRAM

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I. Introduction

- Many machine learning (ML) models already exist that can create AI models.
- There is a lack of general form AI model that can dynamically work with humanoid robots.
- AI models must be made to fit the specific technology, past models cannot be inserted.
- This research aims to create an AI model that allows a humanoid robot to physically move around an environment on its own without programmed responses.

II. Methods

- This research consists of programming functions. Firstly, processing raw data gathered by a human moving their arm. Then the data is recorded in milliseconds to record how far the arm moved between time frames.
- The raw numbers is then turned into training data, by using the sliding window technique.
- With the training data, it is fed into a LSTM model to see how accurately a ML model makes predictions compared to the actual result.
- Prediction numbers are compared to real numbers.

III. Results

- I turned the raw time series data into training data and visualized the movement of a human wrist, elbow, and shoulder in *figure 1*.
- Then used the new data in a LSTM model to see how accurate the ML model predicted new movements to what the real numbers are, shown in *figure 2*.



Figure 1) 3D graph of all 3 joint coordinates during movement.

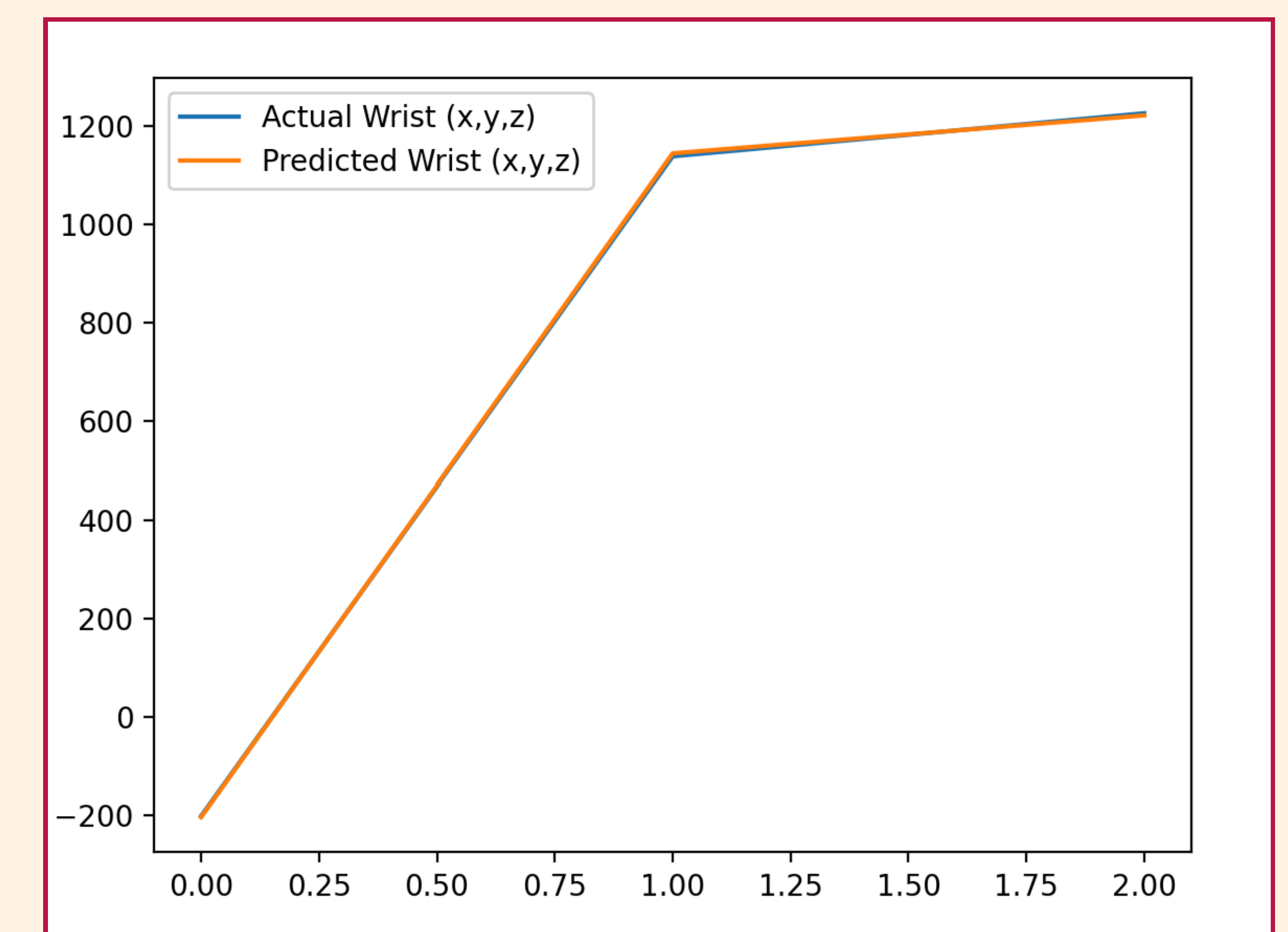


Figure 2) A graph comparing how close the predicted values are to the real values.

IV. Future Work

- Research is still ongoing. Only new motion data prediction has been made.
- Further development is needed like having an AI model generate new points and moving a robot.
- The robot also requires AI imaging software.
- Eventually, robots can fill in hard labor tasks.

V. References

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