PREAL 2.0

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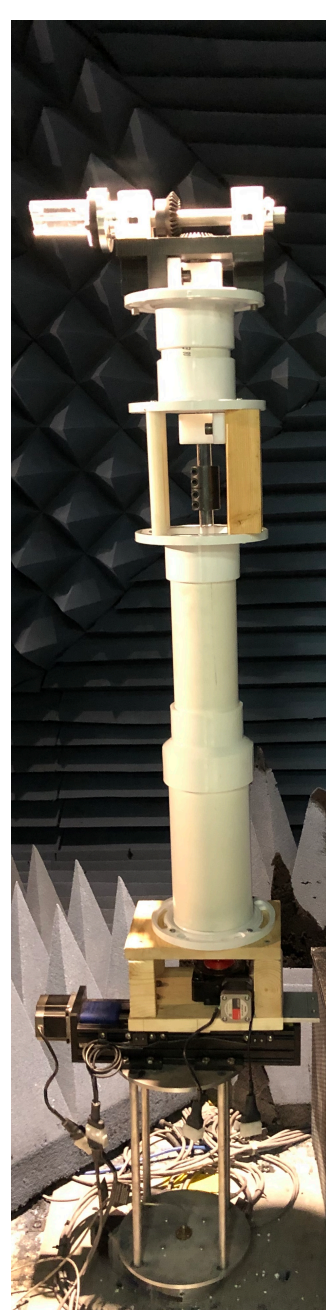Mentors: Dr. Jacob Adams, Dr. Dan Stancil. Instructor: Bobby Compton

Problem Statement

- Implement a new system to improve remote user experience, expand options for instrument control, and better perform data storage and analysis functions for users
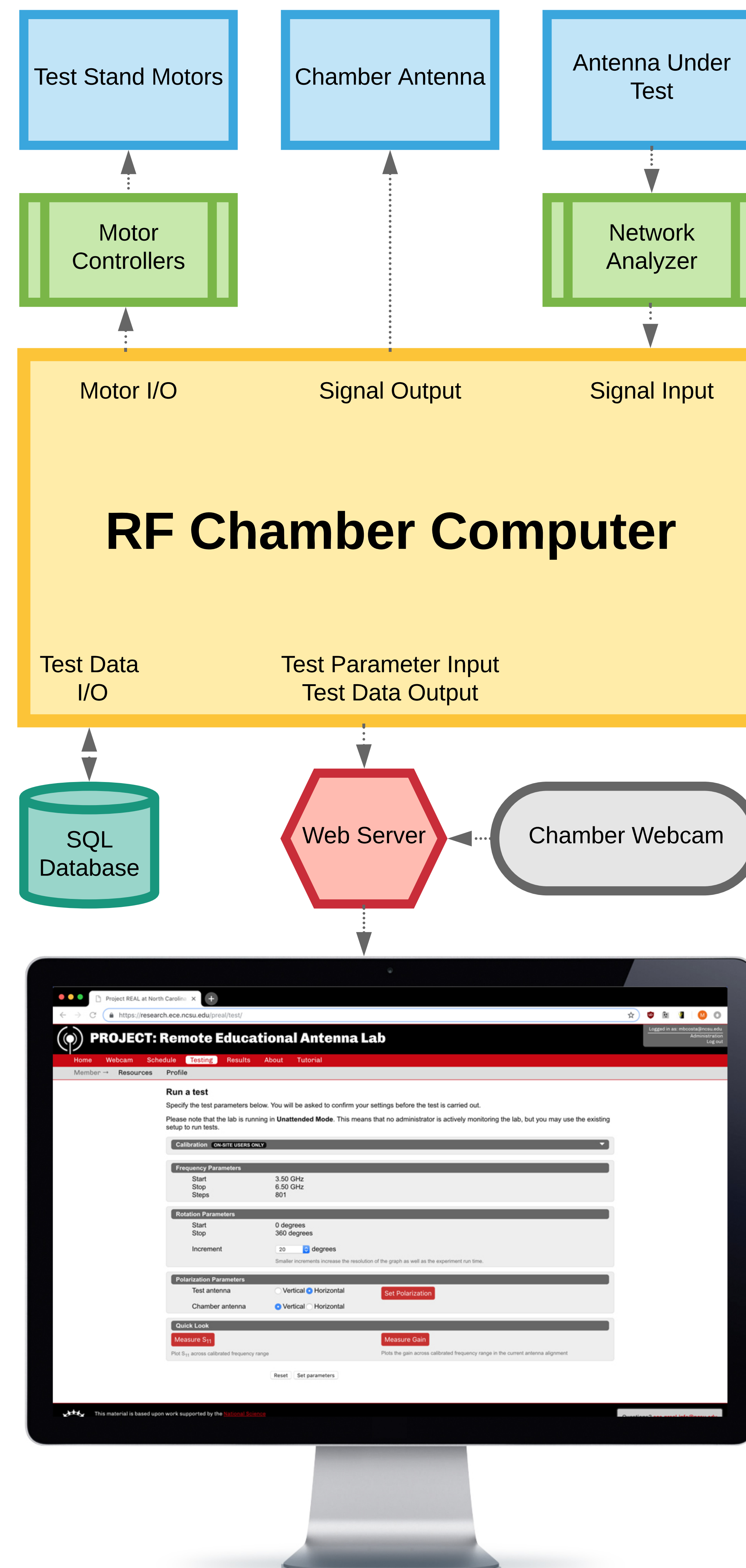
Project Requirements

- Must replace metal stand
- Must improve system speed
- Must add a functioning network camera
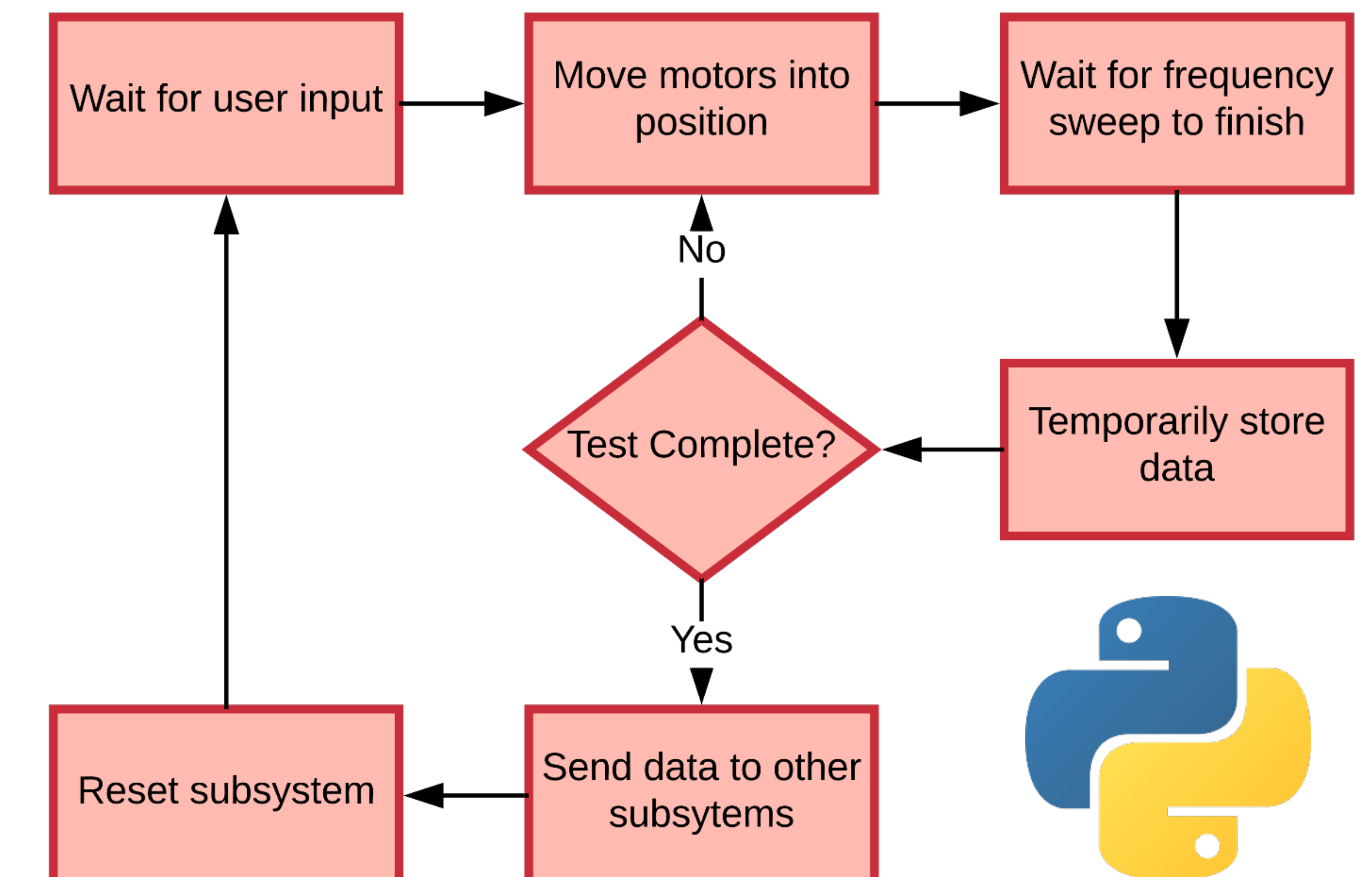- Must have clear documentation for future users

Stand Design

Current System Diagram

Test Stand Motors · Chamber Antenna · Antenna Under Test

Motor Controllers · Network Analyzer

Motor I/O · Signal Output · Signal Input

RF Chamber Computer

Test Data I/O · Test Parameter Input · Test Data Output

SQL Database · Web Server · Chamber Webcam

Software Design

Wait for user input → Move motors into position → Wait for frequency sweep to finish → Temporarily store data → Test Complete? — No → Move motors into position; Yes → Send data to other subsytems → Reset subsystem → Wait for user input

Challenges Overcome

- Creating a mechanical system without a formal background
- Understanding uncommented code from unknown users
- Going through multiple prototypes and iterations

Conclusion

- Improved overall effectiveness
  - Speed of the plots
  - Less interference
- Enhanced user experience
  - Camera to see inside the chamber
  - Detailed documentation