Enhancing and Automating MATLAB GUI for Post-Processing of Experimental Data

General Information:

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Project Tasks:

- **Automation:** Integrate all functions and preprocessing steps into the existing MATLAB GUI to eliminate manual preprocessing steps and parameter changes
- **User-Friendly Interface:** Design a GUI that simplifies the process, requiring only minimal user inputs for experiment-specific customizations
- **Customization:** Include dynamic options that allow easy selection of experiment-specific parameters and settings
- **Robustness:** Ensure the GUI can handle a variety of data formats and experimental setups with error handling and validation
- **Documentation:** Provide detailed documentation and inline help for users unfamiliar with the system

Project Phases:

Requirement Gathering

- Document current manual steps in detail
- Identify all MATLAB functions and scripts currently in use

Design Phase

- Map out the GUI layout and workflow
- Use tools like MATLAB App Designer or GUIDE for prototyping

Development Phase

- Integrate preprocessing steps into MATLAB scripts
- Develop modules for each GUI component
- Use modular programming for maintainability

Testing Phase

- Test the GUI with various datasets and experimental conditions
- Address bugs and improve usability based on feedback

Documentation and Training

- Create user guides, tutorials, and in-GUI help sections
- Conduct a session to train users (students or collaborators)

Deliverables:

- Enhanced MATLAB GUI
- Documentation (user manual and technical documentation)
- Sample datasets with step-by-step guides
- Test cases and results