Hands-on Tutorial for Data Processing Pipelines

Table of Contents

Some background

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- Should we emphasize that many problems with rigor and
 reproducibility
arise before any data are collected (e.g. study design and sampling)?

- Write code for other humans and for your future self
    - Use descriptive variable names
    - Write good comments as you code. This requires striking a
 balance
    between being comprehensive and readability.

- Create well-documented examples that demonstrate how your code works

- Create slides about data analysis pipeline

Analysis, quality assurance, signal processing, statistical analysis

- A potential pipeline for analzying data for a single participant
 (inner
loop)
    1. Import raw data
    2. Perform manual or automated quality control (are measurements
 within
    an expected range, can noise be filtered, can errors be fixed?)
    3. Perform necessary pre-processing steps (segment long trials,
 compute
    secondary variables of interest, filter data)
    4. Perform manual or automated quality control
    5. Compute summary measures
    6. Perform manual or automated quality control
    7. Save the results

- Combine data from multiple participants (outer loop)
    1. Load each participant's data
    2. Store data in a single matrix or structure
    3. Perform manual or automated quality control
    4. Compute summary measures and perform statistical analysis
```

```
Continuous vs. categorical independent variables

    5. Generate figures
%}
```

Example

For this example, we will estimate the maximum knee flexion angle for the right limb during single limb support

Step 1: Import Raw Data

Simulating data using a GLM

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