Assignment #1
Data Process

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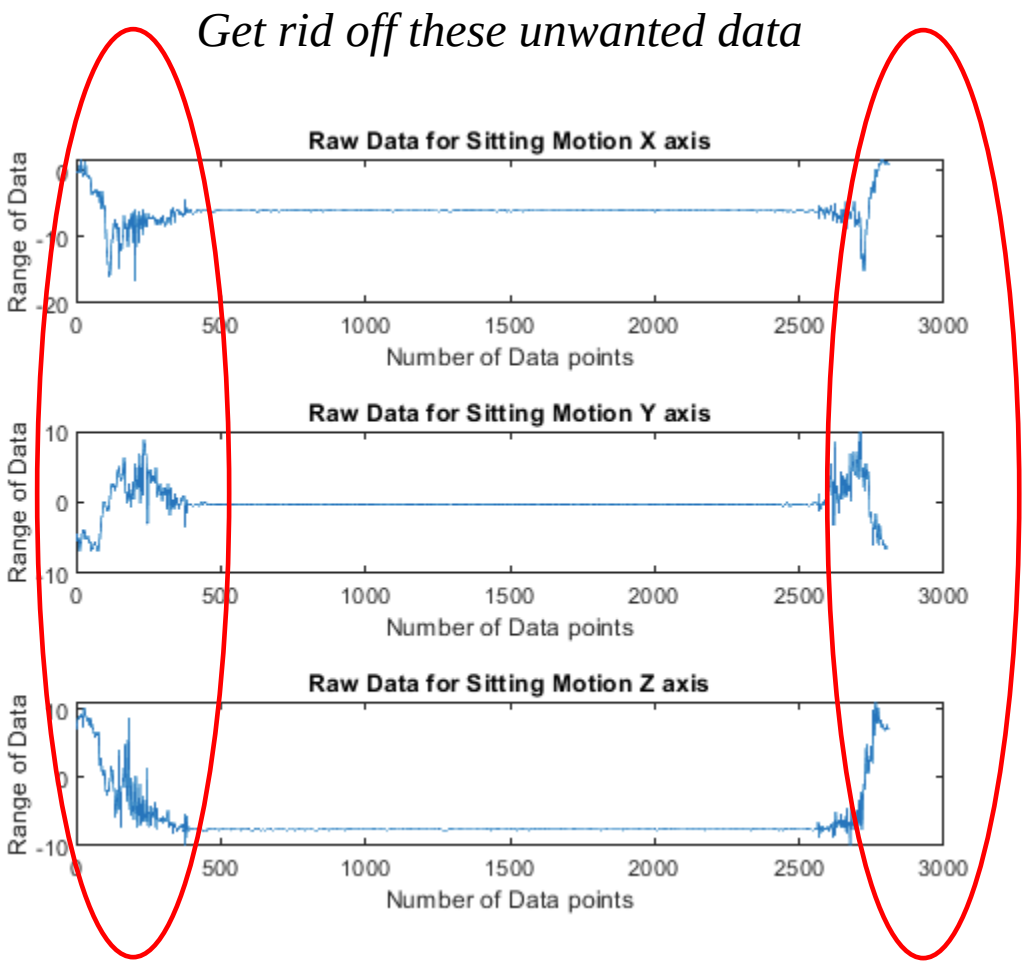
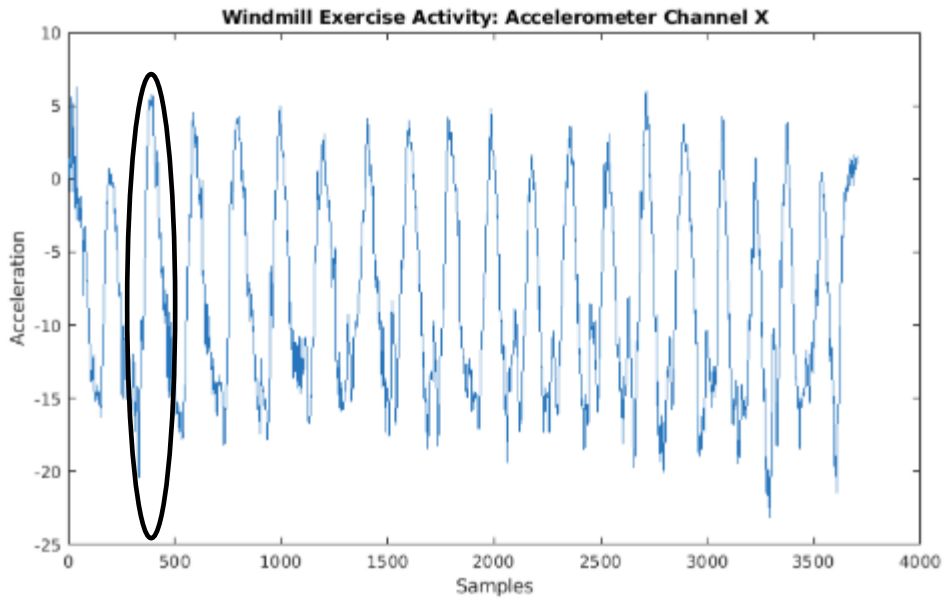
Data Processing Steps

- Part 1: Import/Structure Data
- Part 2: Clipping Data
- Part 3: Chunking Data
- Part 4: Feature Extraction
- Part 5: KNN (not here)

Clipping Data



Chunking Data



- Separate repetitive patterns
- Window size has to reasonable, multiple trials are needed here:
  - Different window size, 80 msec per window, or 120 msec per window
  - None overlapping (1-80, 81-160, 161-240…) or Overlapping (1-100, 81-180, 161-260…)

Feature Extraction with Functions

- Mean Average Value
  - result = mean(abs(data));
- Root Mean Square
  - result = sqrt(mean(data.^2));
- Slope Sign Change
  - function slopeChange = SSC_C(data)
  - for i = 1: (size(data,1) -1) % Assuming Data is a column vector
  - if data(i+1,1) > data(i,1)
  - flag(i,1) = 1; % rising
  - elseif data(i+1,1) < data(i,1)
  - flag(i,1) = 0; % falling
  - end
  - end
  - slopeChange = 0;
  - for i = 1:(size(flag,1) -1)
  - if flag(i,1) ~= flag(i+1,1)
  - slopeChange = slopeChange + 1;
  - end
  - end
  - end
- Positive Peak
- Negative Peak
  - function negCount = negPeak(data,negThresh)
  - negCount = 0;
  - for i = 1:size(data,1) % assumes data is in a column vector
  - if data(i,1) <= negThresh
  - negCount = negCount +1;
  - end
  - end
  - end
- Zero Crossing
  - function crossing = zCross(data)
  - crossing = 0;
  - for i = 1:(size(data,1)-1)
  - if data(i,1)>0 && data(i+1,1)<0 %rising to falling
  - crossing = crossing +1;
  - elseif data(i,1)<0 && data(i+1,1)>0 % falling to rising
  - crossing = crossing +1;
  - end
  - end
  - end

Extracted Feature Matrix (A 3-dimensional matrix)