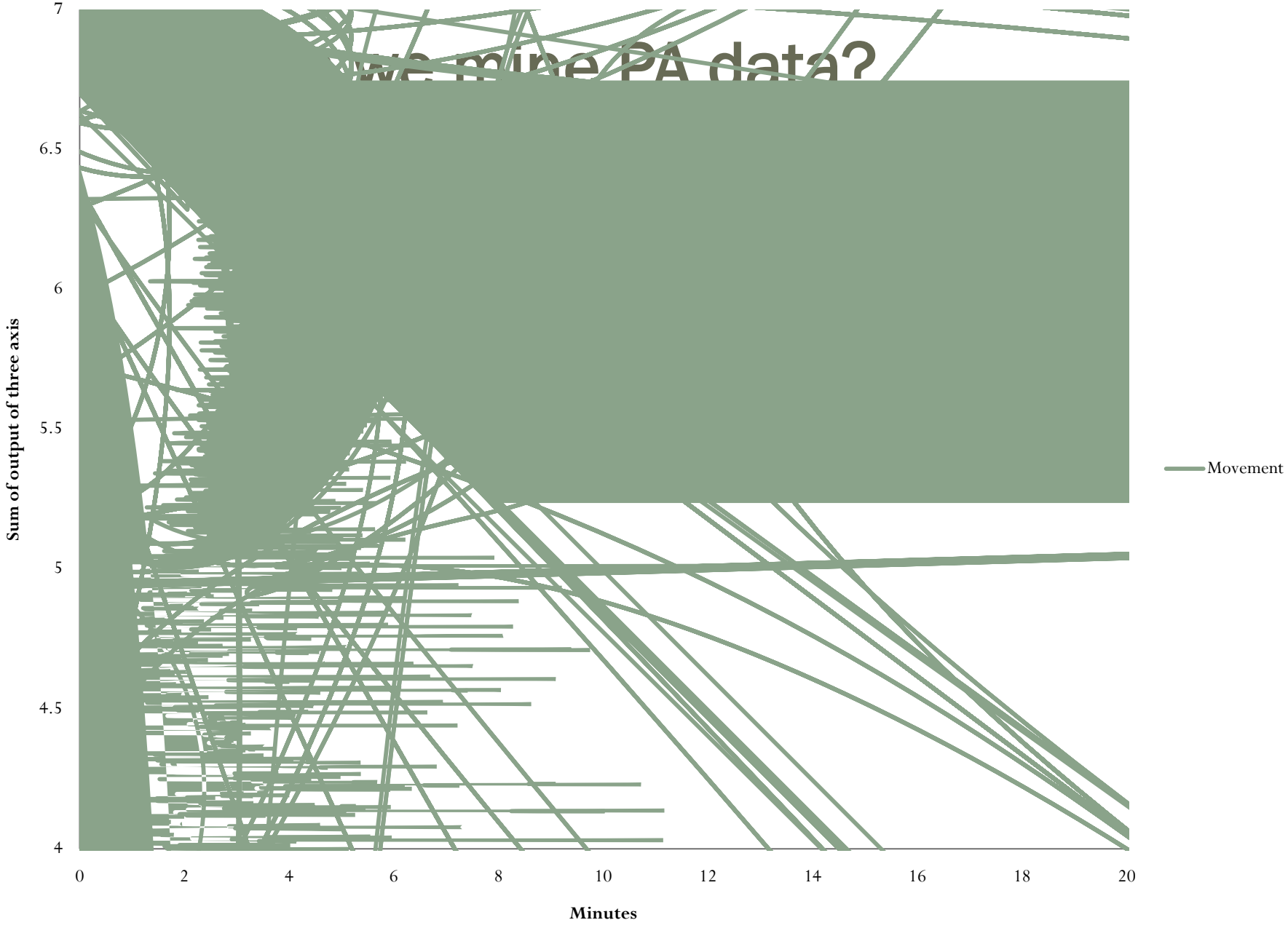
Where do we go from here?


7
6.5
6
5.5
5
4.5
4
Sum of output of three axis
0
2
4
6
8
10
12
14
16
18
20
Minutes
Movement

Option 1: Moving Average/Average

Pros

- Simple to compute
- Quick objective feedback on level of activity

Cons

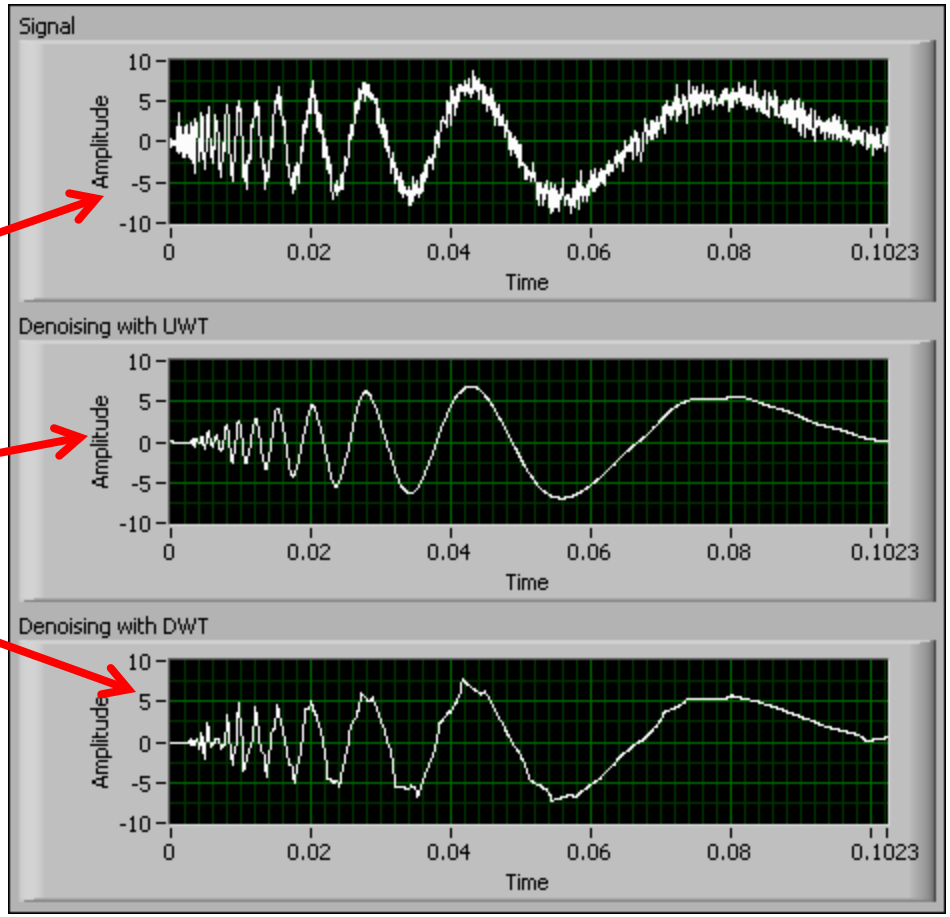
- Loss of data

Option 2: De-noised signals

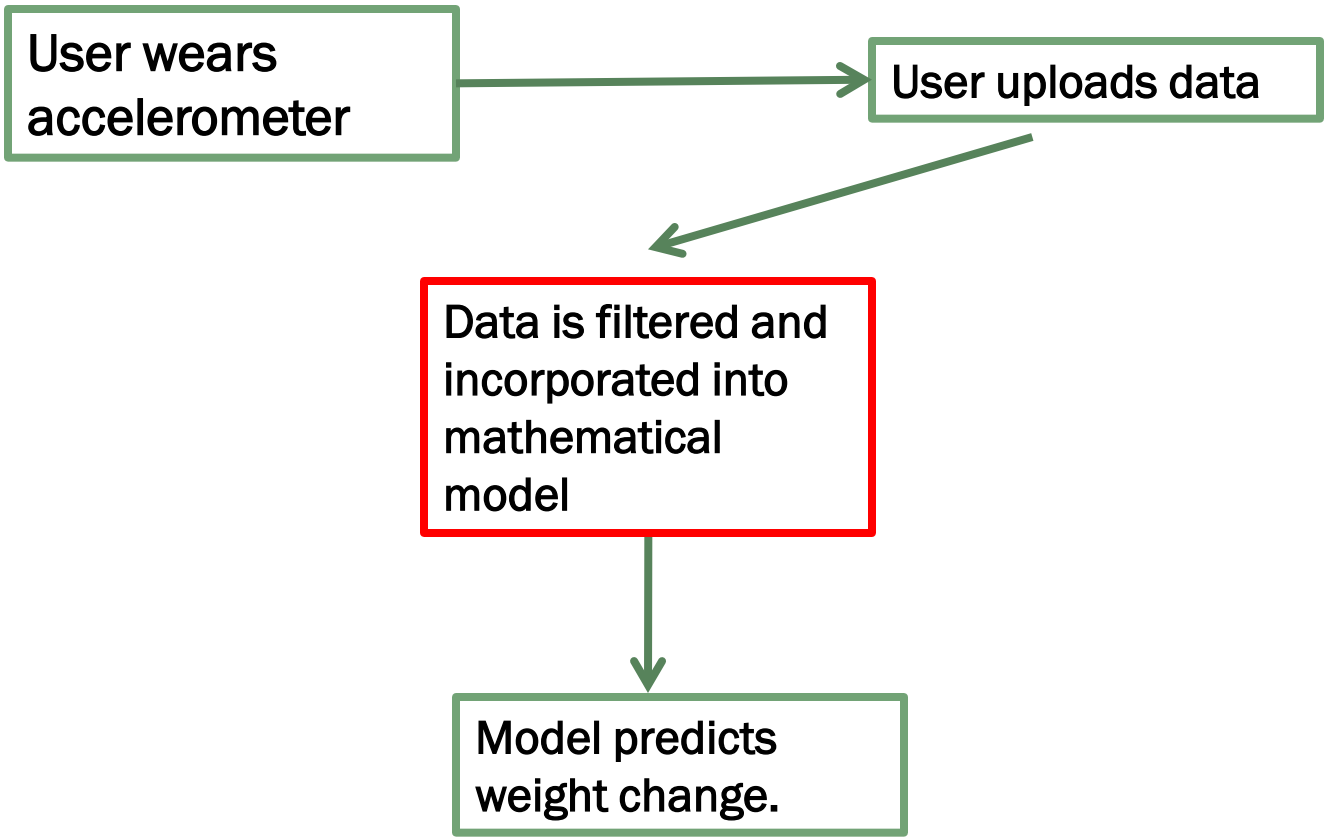
- Goal:
  - Remove noise
  - Preserve useful information

Noisy Signal

De-noised signals



How do we incorporate accelerometer data into energy balance equations?



How do we model PA?

- What are the effects of different exercise on body composition and weight?
- What are the effects of different exercise intensities on body composition and weight?

How can we model exceptions to Forbes?

- What is the effect of changed sleep patterns
- How does disease (HIV, Sepsis) impact body composition?
- How can we improve models during the early changes in weight loss

What are population wide applications of models?

- What causes the energy gap
- What is the mechanism behind waves of obesity?
- What are the feedback mechanisms involved in population –wide (and individual) weight gain.

What further considerations are there in modelling?

- How can we incorporate genetic information within models?
- How can we model social and behavioral reactions?
- How can we model weight change in children?
- How can we model weight change during pregnancy?
- Models that have different compartments for different types of fat
- Models that include hormone changes (thresholds and feedback)
- Development of multi-time scale models (increase communication from whole body modellers with metabolic cell-molec level modellers)
- Organ based fat deposition models (liver, heart, etc.)
- History of subject needs to play a role in model (have they lost weight before?, did their obesity begin during childhood)
- Find “threshold values” that are dimensionless that can predict outcomes.

What type of information will be needed from clinical studies

- Models will be improved with daily weights (soles – Ed)
- Daily weight data sets exist (Racette)
- Model development and validation prefer confined studies
- Continuous time measured waist circumference(rewrite EB equation with waist circumference) Note: has been done but needs to be improved so device doesn't fall off waist (PBRC).
- More DLW measurements included in weight change studies
- Pregnancy Studies
- There exist 24-hour glucose and heart rate monitors