

# IC-SAFE: Intelligent Connected Sensing Approaches for the Elderly

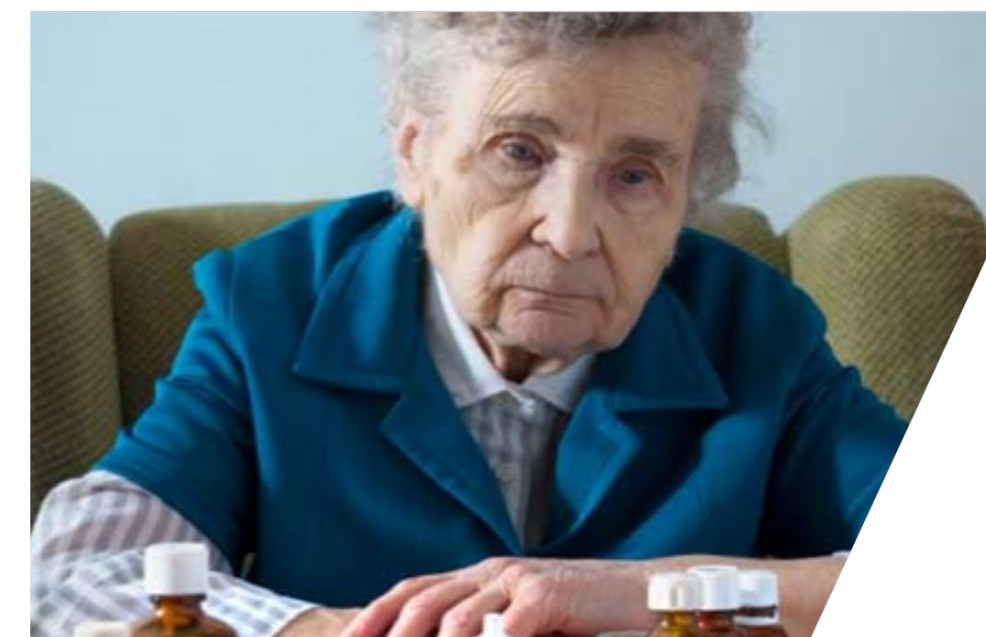
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## 1. Motivation



Who needs our help?



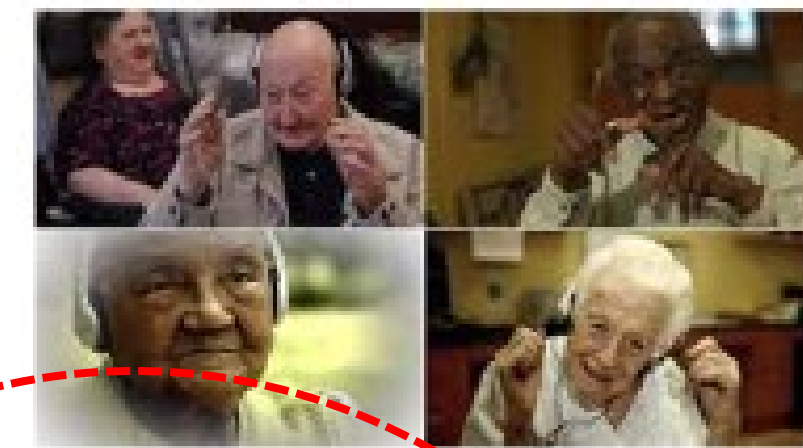
How do I know if they need any help?

Indeed, I am lost!



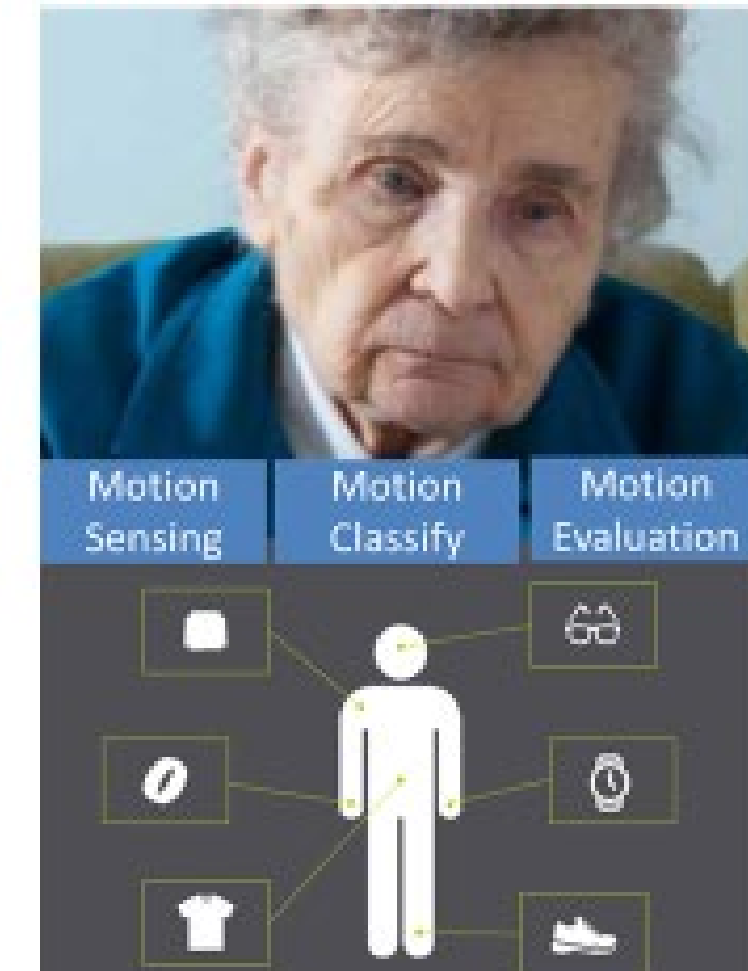
- If I am a person with dementia or autism, a minor child, or a pet
  - Am I aware of if I need a help?
  - Am I aware of how to ask any help?

## 2. AI-Driven Precision Music DJing Service for Seniors



*Alive Inside* (film in 2014): A Story of Music and Memory. Some amazingly transformative results in the treatment of dementia through music.

Automatic emotion sensing with connected sensors



Step 1

AI-driven precision music DJing with various information (gender, age, location, work, medical condition, weather, time, etc.)

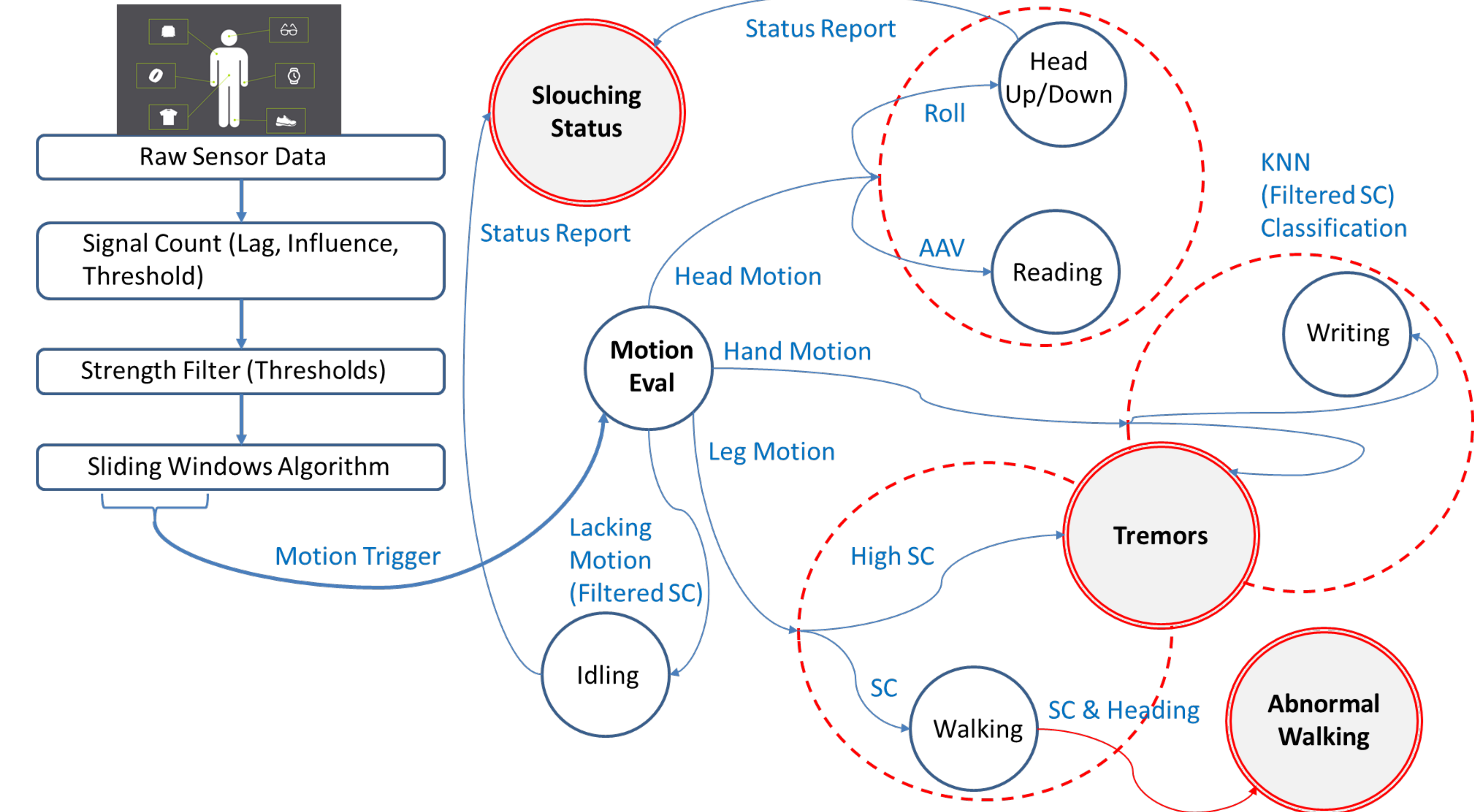


Sensing emotion changes to feedback

Play music via Bone-conduction headphone

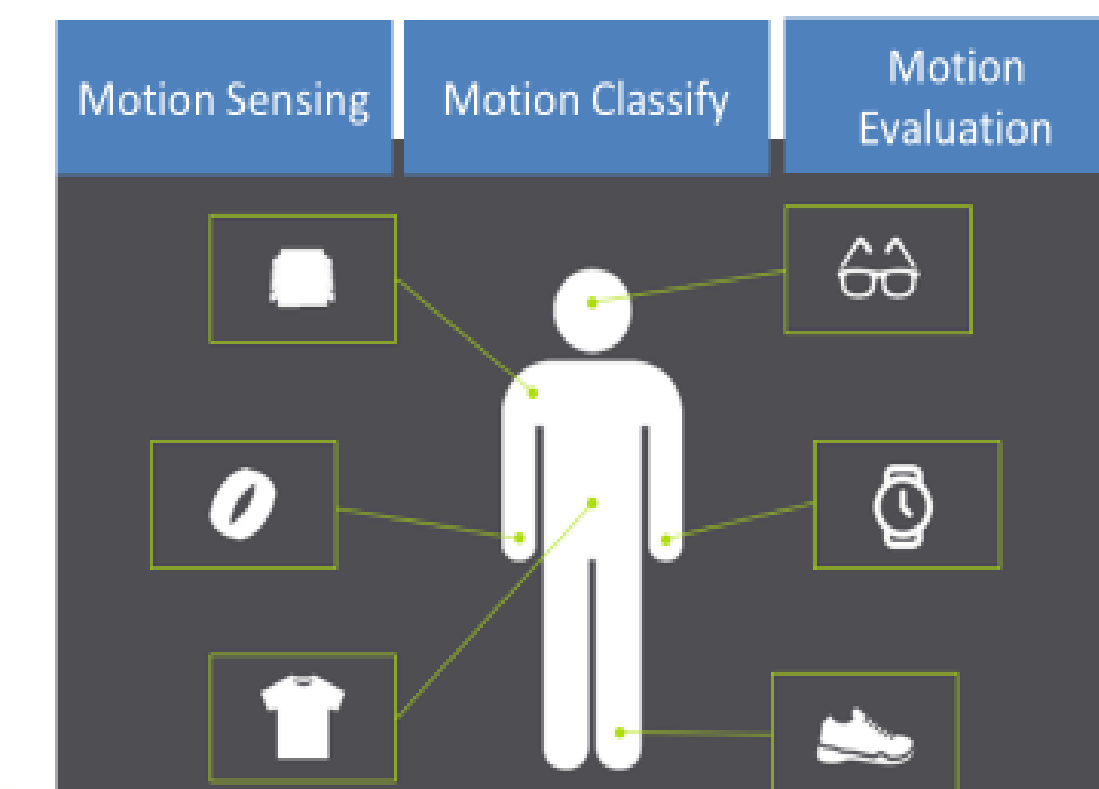


## 4. IC-SAFE Architecture



## 3. Step 1: IC-SAFE

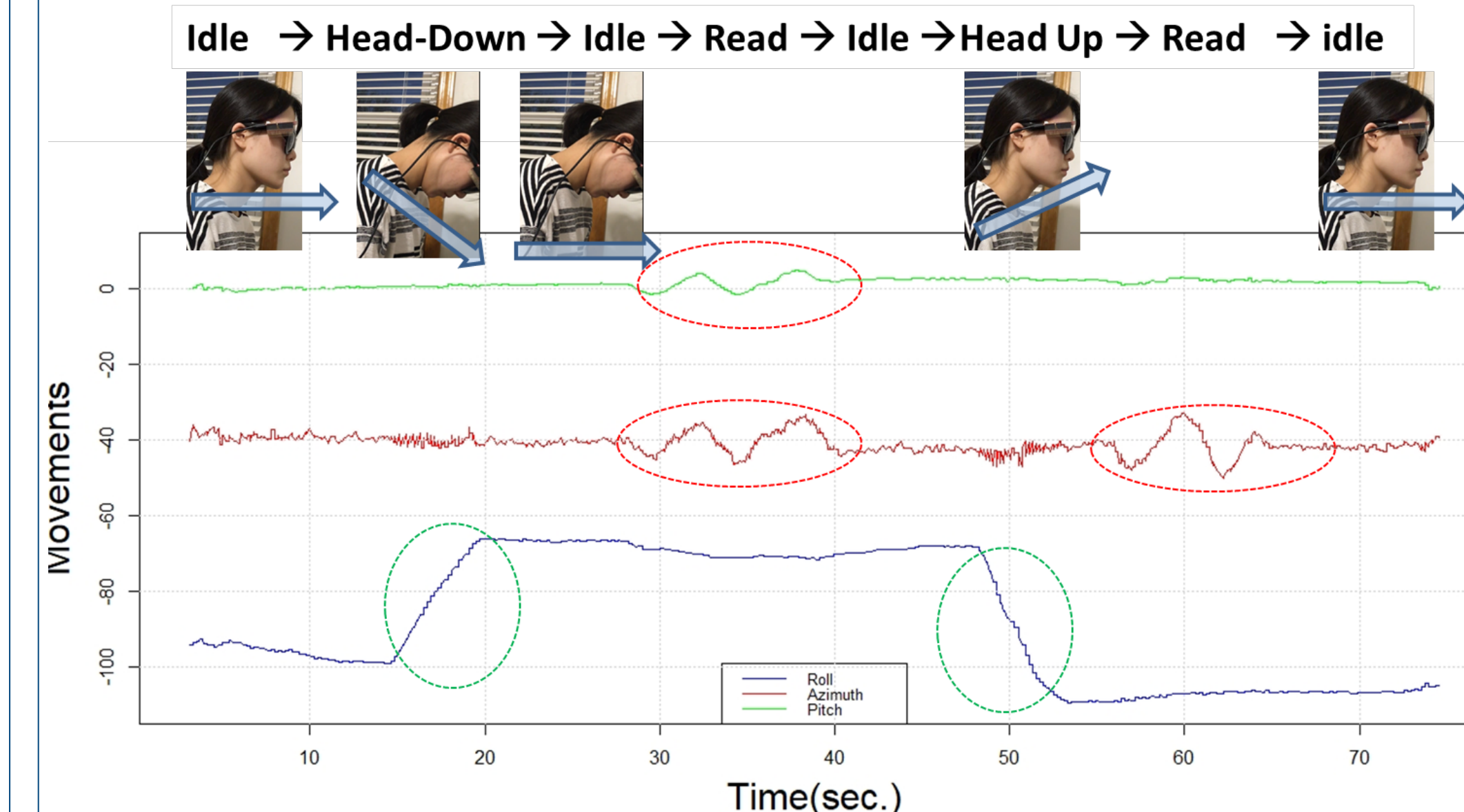
Step 1: IC-SAFE - detect emotions with connected smart wearable sensors



- An automated and minimally invasive solution
- Sensing initial symptoms of distress by coordinating motion data
  - Walking gaits
  - Arm and leg tremors
  - A lack of movement
- Classify the safety status of dementia patients, both physically and emotionally

## 5. Evaluation

Idle, Head down/up, and Reading Scenarios



## 6. Summary

- IC-SAFE (Intelligent Connected Sensing Approaches for the Elderly) tracks the safety of senior citizens by using various connected smart wearable sensors.
- proposed motion data coordination algorithms to detect the walking gaits, arm and leg tremors, and lounging positions for extended periods of time.
- developed wearable IMU (Inertial Measurement Unit) sensor prototypes for various body positions and performed feasibility tests using the gathered data from field experiments.
- detect telling actions of distress and emotional transition scenarios in real-time and distinguish these actions from ordinary gaits with 95% accuracy.