Detecting Cognitive Decline Using Smart Home Technology

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**Problem Statement**
Cognitive decline can be difficult to recognize in outpatient care settings and changes in ambulatory ability may be easier for health professionals to recognize.

**Hypothesis**
Older adults with cognitive impairment will have altered gait and slower walking speed with timed up and go (TUG) testing than older adults without cognitive impairment. Outpatient centers could use gait analysis to inform diagnosis and this may be more acceptable to older adults than overt cognitive testing.

**Smart Home Technology**
- Seat Pressure Sensor
- iPhone
- Accelerometer
- Infrared Ceiling Sensors
- High Resolution Camera
- Machine Learning

**Analysis Methods**
- Data Mining With Retrospective Analysis
- Machine Learning
- Time Domain Waveform
- Peak Detection

**TUG Test**
Get up from chair walk 10 ft, turn around walk 10 ft back, turn around & sit down

**Implications**
Interventions to improve screening and the ability to identify decline early and accurately are critically needed to improve patient safety and outcomes. They may also be more acceptable to older adults than overt cognitive testing.

**Captured Walking Cadence**

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<th>Participant</th>
<th>Age</th>
<th>Gender</th>
<th>TUG Trial 1</th>
<th>Total Trial Time</th>
<th>Time Between Peaks</th>
<th>Median Time Between Peaks</th>
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