EE98 Capstone Project
Fall Prediction Using Anomaly Detection

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1 MOTIVATION

A fall can have disastrous consequences to elderly people, resulting in a degraded quality of life afterwards. Their gait pattern can indicate a fall is imminent.

2 GOAL

- Develop flexible biosensors to track gait pressure patterns
- Process and analyze the collected data to detect anomalies that are indicative of a fall in the near future
- Error-resistant UI/UX that integrate smoothly into the user's life and convey appropriate data in an empathetic way

3 Research

- Understand regular vs irregular gait, modes/reasons/surfaces for falling based on medical research and interviews
- Investigate how to passively collect data
- Identify limitations and requirements for insole

4 Design

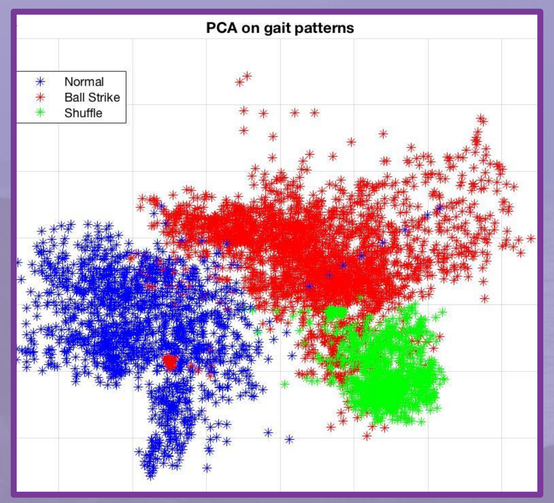
- Fabricate insole with pressure sensors
- Develop data collection system
- Create system to record data for anomaly analysis

5 Testing and Iteration

- Record different user movement for categorization
- Interviews with user, surveys with family, professional opinions on UX usability for elderly, moderated usability studies, heuristic analysis
- Reassess design choices of current version for design of the next version

6 Data & Results

- We can detect different balance placements
- We can accurately classify different types of gaits over short-term periods between normal gaits and anomalous gaits



7 Future Steps

- Collect larger full day data sets for better algorithm analysis
- Iterate on design for increased reliability/usability/adherence