iMup: A Body Position Tracker

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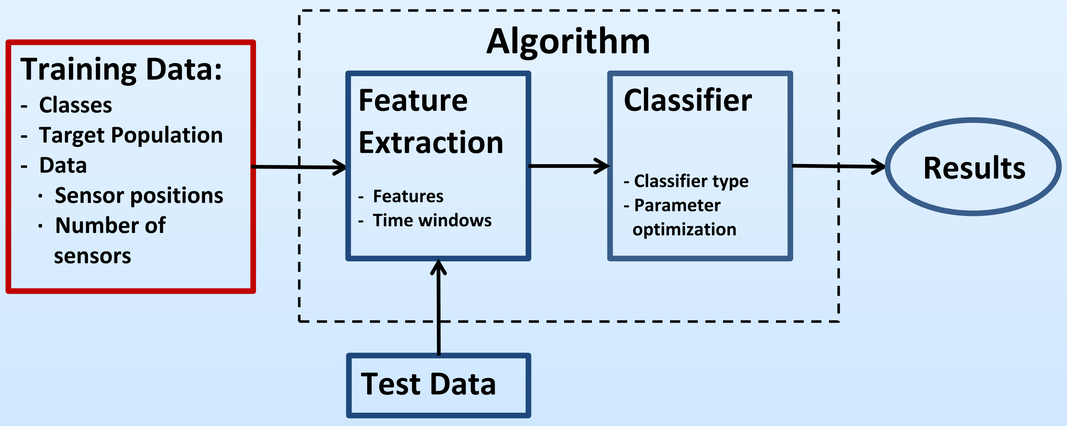
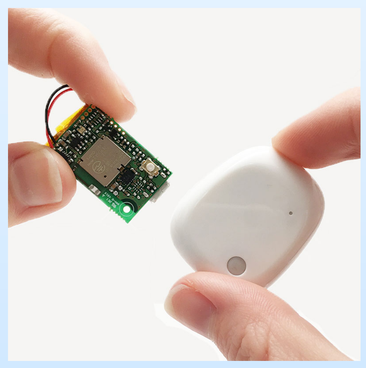
Research Objective

- To collect human data to train a machine learning algorithm to determine body position to help inform care
- To accurately determine laying, reclining, sitting, standing and walking



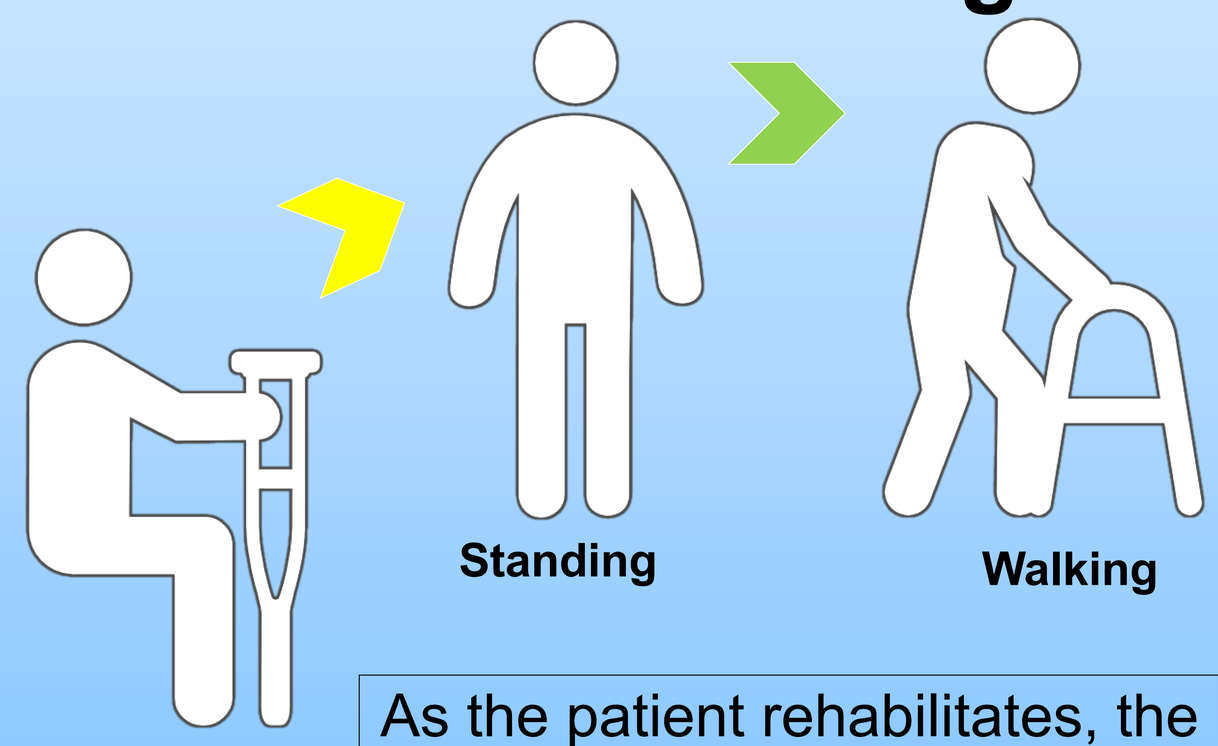
Data Collection & Design

- 15 healthy older adults (55 and older)
- 15 healthy adults (18 – 55 years old)
- Participants wore 2 sensors (Mbient MetaMotionR) on right thigh and right chest under clavicle
- 10 minutes of activity per subject
- Subjects directed through each position, maintaining for 1 minute, twice
- Data was captured remotely by iOS mobile application



MetaMotionR Sensor

Position Tracking



As the patient rehabilitates, the app records the improvements in posture and the length of time spent in each position .

Results of Initial Trials

Geriatric LOSO: 95% correct

Truth \ Response	Laying	Reclining	Sitting	Standing	Walking	
Laying	84.7	14.6	0.7	0	0	[459]
Reclining	3.6	95.1	1.3	0	0	[468]
Sitting	0.2	2.2	96.5	1.1	0	[461]
Standing	0	0	0.2	99.1	0.7	[442]
Walking	0	0	0	0.6	99.4	[475]

Overall accuracy of ML algorithm is 95%

Conclusions

Preliminary studies show data from two worn accelerometers can determine an individual's body position. The algorithm will be used to inform future clinical movement analysis and clinician reporting based on custom trained data.

The Rehabilitation Engineering Research Center for Information and Communication Technology Access (LiveWell RERC) is funded by a 5-year grant from the National Institute on Disability, Independent Living and Rehabilitation Research in the U.S. Department of Health and Human Services (grant number 90RE502a3). The opinions are those of the LiveWell RERC and do not necessarily reflect those of the U.S. Department of Health and Human Services or NIDILRR.

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