7b.044.SBU - Human Behavior from Insole Sensor Data

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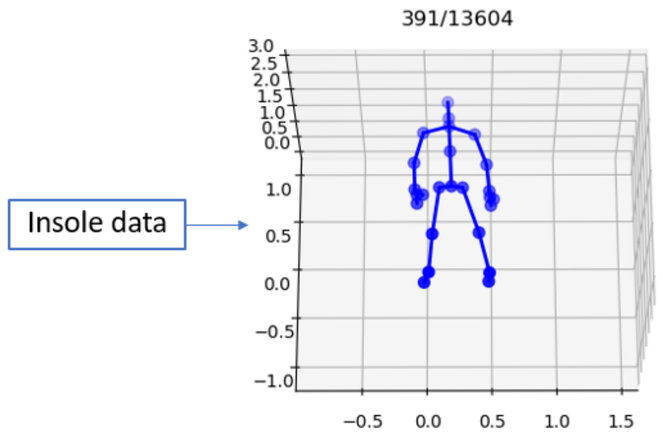
Project Start: 02/01/2018	End Date: 01/31/2019	Project Budget: $40,000	Spent: $35,000

Project Summary:
With Zeblok insole sensor, we can collect insole data from subjects. However, insole data can only provide us signals from the shoe and from these signals it is hard to tell what is happening to the subjects. In order to visualize the human behaviors that best correspond with insole sensor data, we use machine learning techniques to learn a mapping between the insole data and the full skeleton data. After learning such a mapping, we can predict other body motions of the subject that can be useful for diagnosis and for providing better healthcare.

Details of Progress/Achievements:
We have implemented the recording pipeline for human skeleton data using the Microsoft Kinect SDK. We record the time stamp and the 3D coordinates of 25 joints of the human skeleton. The frame rate of the skeleton data is approximately 28. We also synchronized the insole data and skeleton data according to their time stamps. We have implemented an LSTM deep learning model to learn a mapping between the insole data and the skeleton data. In the testing phase, we input insole data into the LSTM and it outputs skeleton data. We have also implemented visualization of the skeleton data.



PROJECT DELIVERABLES

Deliverable	Achievements	Remaining To Do
Record human skeleton data using Kinect	100% Completed	None
Synchronize between insole data and skeleton data	100% completed	None
Implement LSTM to learn mapping between insole data and skeleton data	50% completed (waiting for insoles to collect data to train and test)	Waiting for repaired insoles to collect data for training and testing
Visualize skeleton data	100% completed	None