

Abstract: Smart Homes

Sensors, in their many forms, have the ability to transform how people live. Introducing sensors such as environmental, video/depth sensors and those worn on the person (such as accelerometers) into a home could potentially give us the ability to analyse and subsequently predict frequent activities in order to make homes smarter. Energy could be saved when the home is vacant, the layout could be adapted to avoid trips and falls, and medical diagnoses could be conducted remotely; all due to analyses from sensors.

In this project, we seek to gain an understanding of sensor data obtained from within a home environment. Using data obtained from a wrist-worn accelerometer, video and depth (RGB-D) data and passive environmental sensors in a home context, we aim to gain insights into the actions and activities conducted by the participants. The data is mainly explored from a visualization standpoint, and the main deliverable of the project is a web application which enables quick, and easy interactive visualization of the sensor data.

The analysis was based on preprocessed sensor data which was ingested into MongoDB and queried to generate visualisations both in Jupyter Notebook and in a Bokeh-enabled web application. The Python general programming language was mainly used to manipulate the data. Several other developments such as video processing and processing of accelerometer data are also underway towards completing the project. The work done towards the project so far is available at <https://github.com/smartHomeDataScience>