COMP3217 Security of Cyber-Physical Systems 20/21

Coursework 2: Detection of Manipulated Pricing in Smart

Energy CPS Scheduling

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# Introduction

A small community of 5 users, each has 10 smart home appliances. These users will have varying energy consumptions throughout the day (any period of 24 hours). Naturally, appliance usage will be far greater during the day while the users are awake and often have peak usage at the same time(s) as other users. To keep up with this energy demand, energy providers set higher prices during these peak times to discourage users from using their appliances, resulting in a lower load that needs to be managed by the providers. A smart home scheduling system can be used to provide the user with a schedule of when to use their appliances throughout the day, theoretically lowering the cost to the user. For example, if there are two free time-incremented slots before a task is to be done but the second time slot would be cheaper to do a task in, the system would advise the user to conduct the task in the second slot.

Such a system can be computed via linear programming to decide which appliance to use and when. In order to build an effective system, a set of data, outlining each of the tasks performed by each of the 5 users, has been provided and used.

# Implementation

## Git Repository

The implementation of this project used a GitHub repository for back-ups, storage, and access between physical and virtual machines. This repository can be viewed from here:

<https://git.soton.ac.uk/sa11g19/COMP3217-Coursework-2>

## Makefile

To run this project, a Makefile was used (Appendix ).