Energy Intelligent System

Submitted to Dr. Dagmar Niebur and the Senior Design Project Committee
of the
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Team Number: ECE-39

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Submitted in fulfillment of the requirements for the Senior Design Project

May 11, 2005

Abstract

The high consumption of electrical energy in the United States has caused a significant decrease in our electrical generation resources. The non-intrusive Energy Intelligent System (EIS) promotes energy conservation in residential homes in order to reduce the average consumption of electricity. Once all significant individual appliance current signatures are recorded, the EIS will measure the aggregate appliance signatures from a centralized meter.

This system will provide homeowners with power consumption and pricing information of the appliances that are operating in the household. The design and development of the EIS includes data acquisition and signal conditioning tools and procedures, the EIS algorithm, and the Graphical User Interface. The effectiveness of the EIS is demonstrated on an electrically wired small-scale model home.

The EIS system successfully identifies the on and off state of the appliances in the model home. Also, the GUI successfully demonstrates the on and off state of each appliance, as well as the power consumption and pricing information for the appliances.

Despite its successful identification of appliance the algorithm has some limitations. It does not automatically detect a new appliance that has not been tested. Also, if two appliance signatures fall within the same steady-state current range the algorithm will not detect the appliances.

We have fulfilled our schedule requirements and have remained under the original proposed budget.

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