

Matchsticks: Modelling a house

Carl Ellis Mike Hazas

School of Computing and Communications
Lancaster University
Lancaster, UK

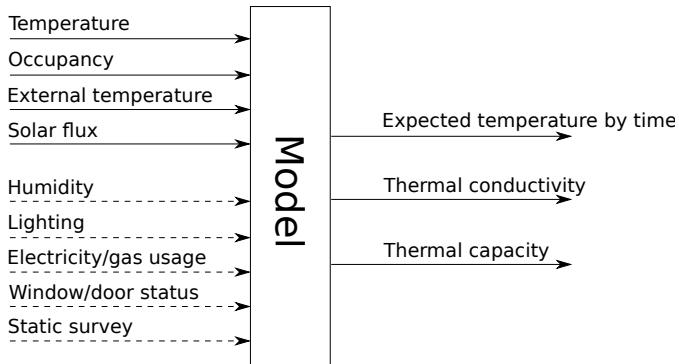
September 27, 2010

Background of the Problem

- ▶ 62% of residential energy in the UK comes from space heating
- ▶ Often in the form of a single temperature control for the whole house
- ▶ Systems are sluggish to respond to user input
- ▶ There exists a need for an automated system to bring your house temperature to a comfortable level
- ▶ For these systems to successfully reduce energy requirements, whilst maintaining user comfort, there is a need to create a **per room** building model
- ▶ Future actuation systems can then use this model to do their jobs in the most efficient way.

- ▶ Per room sensor network within the building
- ▶ Sensing and logging given data to model each room.
- ▶ Get thermal data, per-room occupancy data, and outside weather data at the very least
- ▶ Other optional data to be given to the model:
 - ▶ Humidity
 - ▶ Whole-house electricity/Gas meter readings
 - ▶ Door/window open or closed
 - ▶ Floor plan, or other building information model (BIM)
- ▶ From this data create a model which parameterises thermal conductivity and capacity, and predicts expected temperature by time, at a **per room** level.

Proposed Solution



Any Questions

Thank you for your time and attention, any questions.