



Arash Beizae 1st Year PhD Student

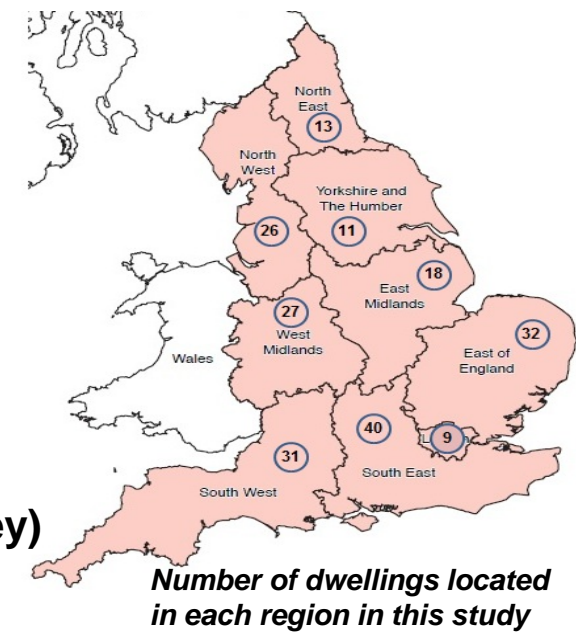
Aims

One of the first nationally representative studies of summer temperatures in English dwellings which aims:

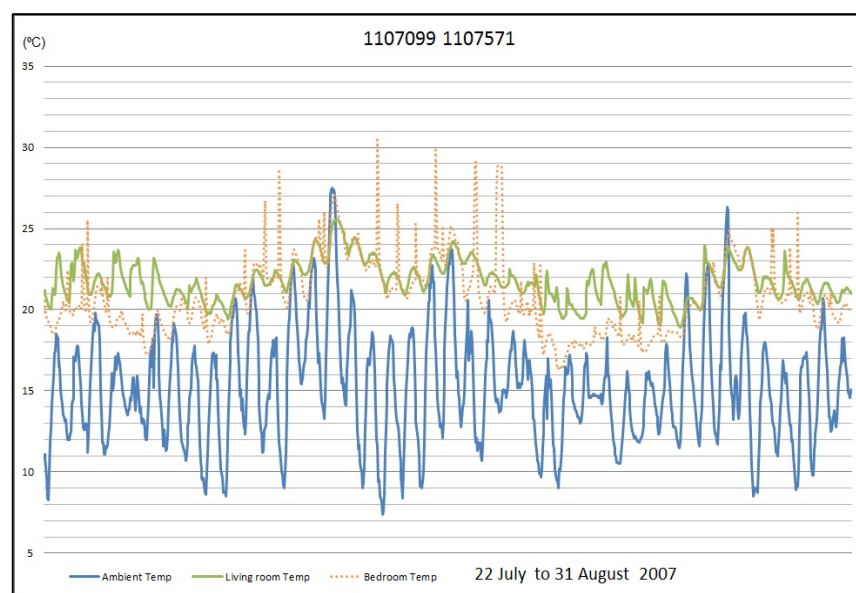
- To give a better understanding of “real-world” summertime temperatures in English dwellings.
- To compare the indoor temperatures to the thermal comfort standards (CIBSE & BSEN15251).
- To investigate how building characteristics would influence the indoor summer temperatures.

Methods

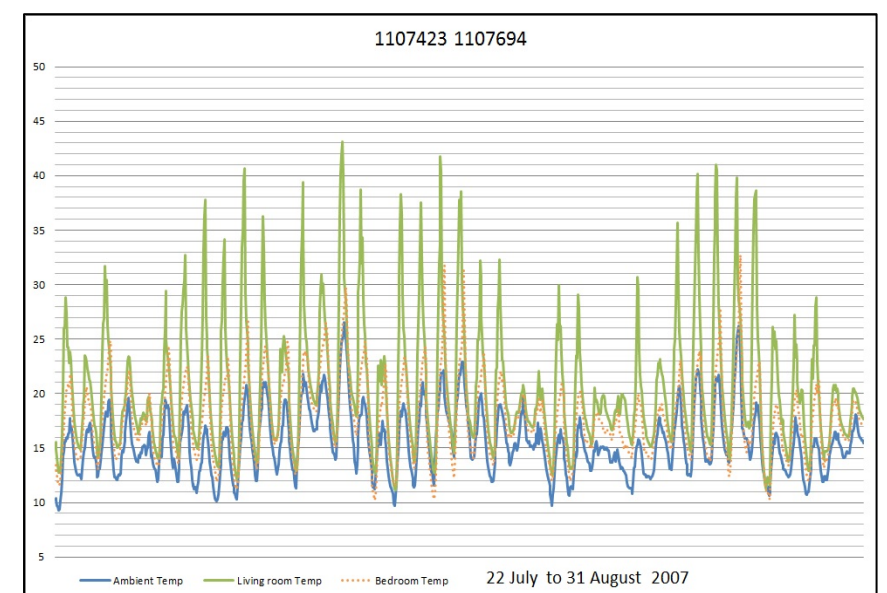
- CaRB project database: Hourly living room and bedroom temperatures (252 dwellings) + dwelling info (Domnat Survey)
- Over 30 local weather stations: hourly ambient temperature data were collected and analysed
- Plotting hourly indoor against outdoor temperature: indoor temperature measurement errors and heated homes were identified



Hobo Sensors used for Indoor temperature Measurements

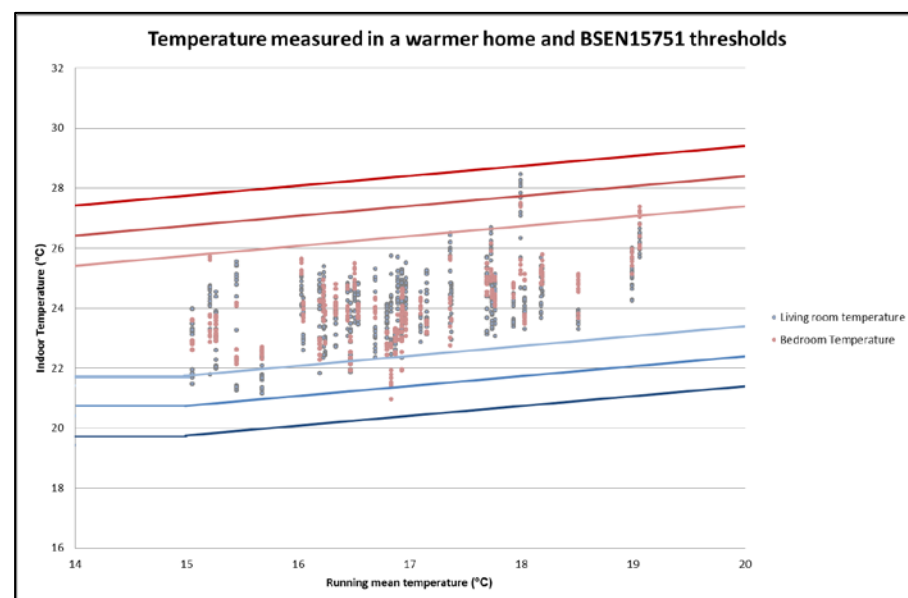


Example1: Observance of Night time heating in a bedroom



Example2: Extreme responses correlated to solar radiation

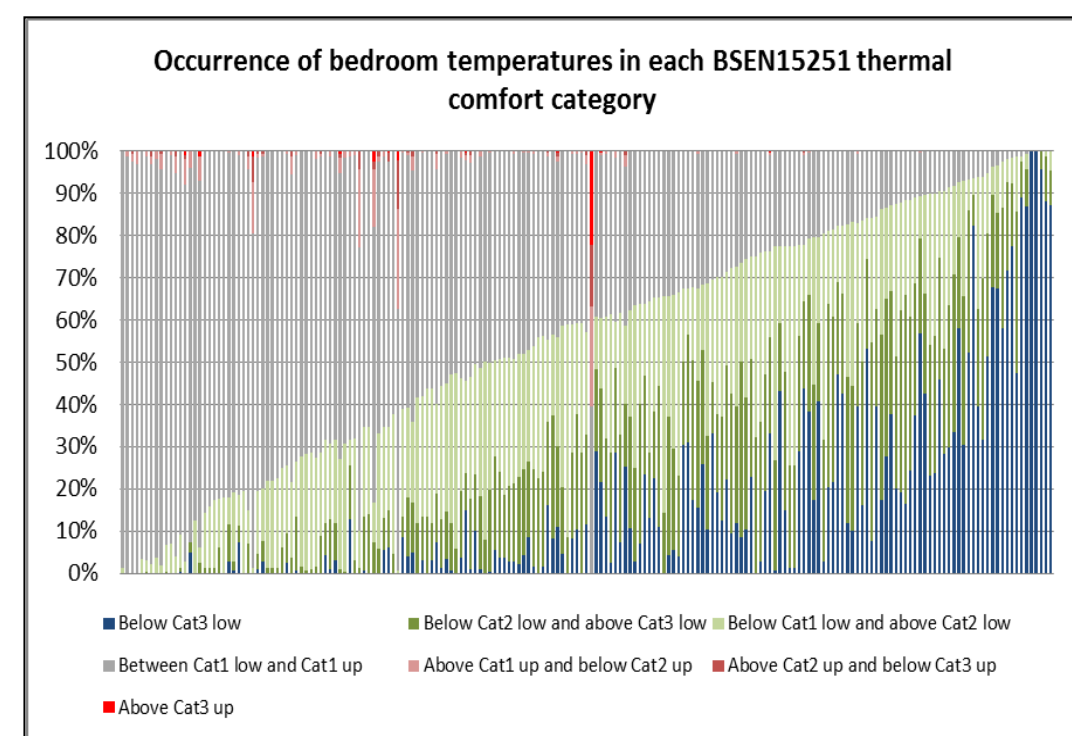
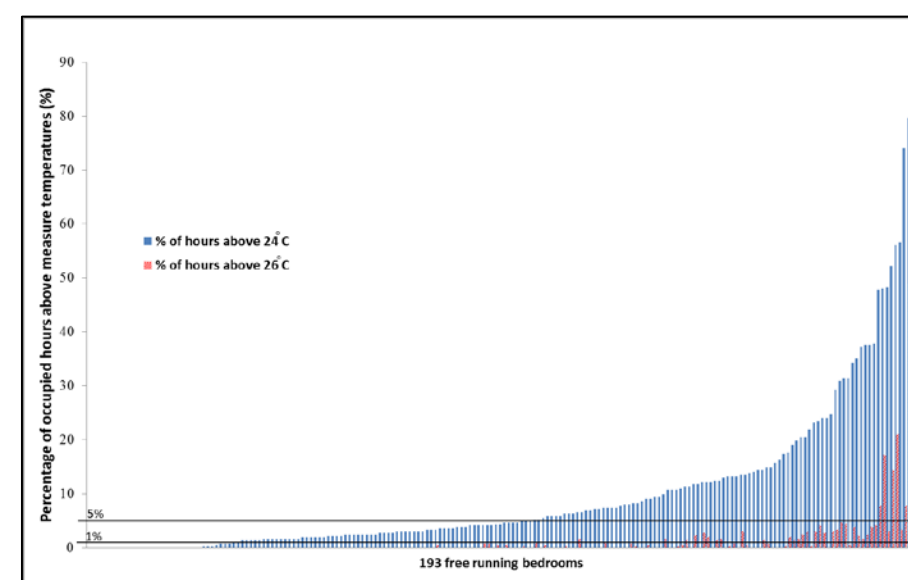
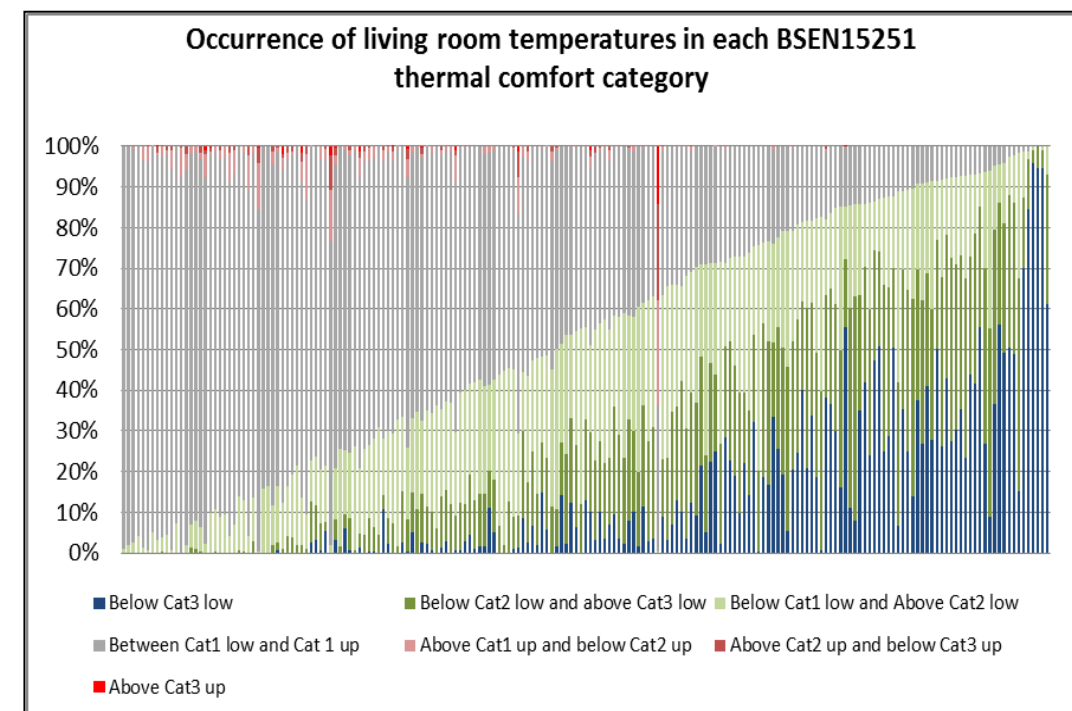
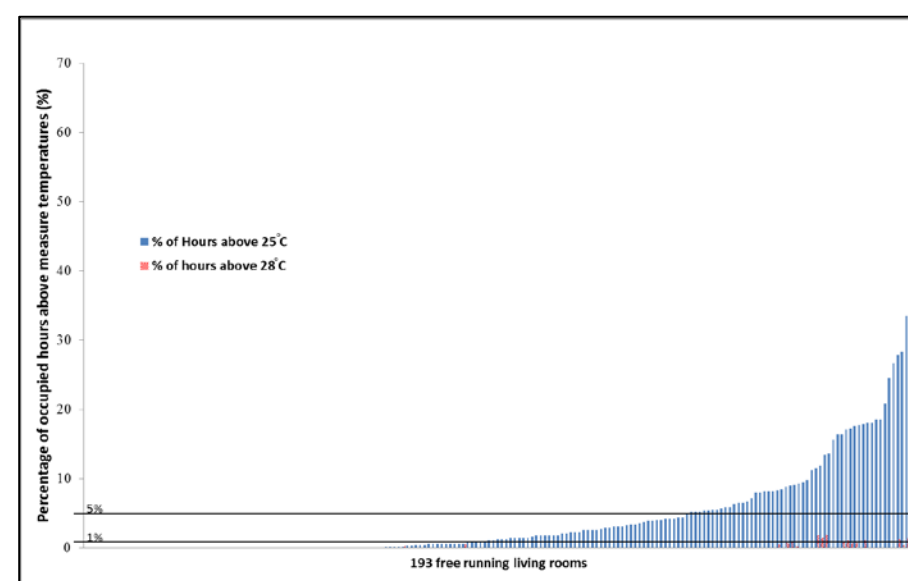
Results



Key Findings

- Despite the mild summer weather conditions in England, 27% of the living rooms and 46% of the bedrooms were more than 5% of their occupied hours above 25 °C!
- Overheating was more problematic in bedrooms with over 20% of them experienced temperatures above 28 °C more than 1% of their occupied hours!
- Top floor flats and recently built dwellings (post 1990) are at highest risk of overheating!
- Oldest homes (Pre 1919) and solid wall properties were the dwellings with the lowest temperatures during summer!
- Heating were observed in 6.7% of the dwellings in the nationally representative sample!
- During Summer, English homes spent a considerable period of their operation at conditions cooler than the BSEN15251 thermal comfort recommendations!

Category	Level of comfort	predicted dissatisfaction in normal health people (PPD)
1	High level of expectation	6%
2	Normal level of expectation	10%
3	Low level of expectation	15%



PhD Project

Heating Control Technology Optimization for Energy Demand Reduction in UK Homes using Smart Home Technology

PhD project aims to investigate the domestic heating energy demand reduction which could be achieved in the UK homes by applying zonal control using different Digital Technology (DT) control devices.