**Project Proposal**

**1. Basic information**

1.1 Student Name: *Ian Hutchinson* Student Number: *20048122*

* 1. Project title: Mapping Temperature Flow Using IoT solution

1.3 GitHub Repo: https://github.com/Irhutchi/home-temperature-mapping

**2. Project description**

Climate change is one of humanities biggest challenges of the 21st century. Every individual can do their part by making small changes to reduce their carbon footprint. Homeowners are being incentivized to retro fitting and improve efficiencies in the home. In 2018, it is estimated that 185k homes or 12% of the Irish housing stock hold an A or B BER rating.

This project attempts to build an IoT device will use a Raspberry Pi and some use of inexpensive electrical components widely available. Deploy several standalone sensors throughout a building to gather data that is sufficient to accurately map temperature differences between different areas of the home. The environmental data can then be used to inform homeowners of areas where energy is being wasted potentially. The network must be flexible in terms of adding or removing sensors to accommodate different monitoring requirements.

**3. Objective of the project**

Deploy sensors across an area of the home or small business that publishes temperature data to the cloud which can be accessed via IoT platform such as ThingSpeak. Analysis of the data can be performed as well as providing status notifications to email or similar.

**4. Tools and Equipment**

Having a little experience in electrical technology, I aim to build smart sensors using the following components:

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| * Hand Tools * Solderless breadboards * Jumper wires * Raspberry Pi * Capacitors | * ESP8266 Wi-Fi modules * ds18b20 or TMP36 Temp Sensors * Resistors * AA battery holder * AA Batteries |

As of writing, implementation is still in the planning phase. Communication protocols covered in the module from data link layer to application will be implemented.

**5. Technology**

* TCP/ IP Protocol Stack
* MQ Telemetry Transport (MQTT) – Publish - Subscribe
* ThingSpeak / Home Assistant possibly
* Secure Shell (PuTTY) – Headless Raspberry Pi.
* Python 3

