

IoT Pump Priming Fund 2019: Call for Proposals

N Harris/ J Curry

What we want to do

We have a 3rd year student who did a project on air quality sensing. This has scope as a live demonstrator so we propose to build a developed version of this into a demonstrator to have a live data stream of PM2.5 content available online.

We propose several sensor nodes be built and monitor both inside and outside to get some idea of particulate levels in different locations and times. This will illustrate the usefulness of IoT systems and also allow a database of particulate data to be developed, providing a useful source of data for students to start to analyse.

The project will leverage the previous years project in that it will feed into the newly refurbished Lora basestation that we have on the roof, and data will be available through the virtual server that has been allowed by iSolutions (iSolutions have agreed to supply a virtual machine to support our Lora Basestation and this is currently supported though the teaching budget)

The node will build on last year's design, and be solar powered and use the existing low power node design, coupled with the students sensor design (which exists) , so it is a systems design exercise rather than a fundamental technology design, which fits with the timescale.

Its strategic fit to the IoT is that it provides a tangible output of the use of the IoT as live air quality data can be made publicly available. It will also inform and help the development of the IoT MSc degree by providing experience in the use of IoT devices.

Who is involved

We plan to employ Josh Perriman (ECS undergrad) as an intern for 1 month. He will work with Josh Curry (a PhD student researching power harvesters for the IoT). Both these students were instrumental in designing the original Lora node last year and so are best place to take it further. In addition, it is Josh Perriman's part 3 project that we wish to expand, so the team is ideal to develop this. We envision the majority of the work (and all spend) being complete by the required deadline, but final construction and fine tuning will be carried out after this if necessary by Josh Curry.

Expected Outputs

We expect to have at minimum, 2 self-powered sensor nodes (one inside, one outside) to measure PM2.5 continually and displaying this information on a public dashboard. This will act as a precursor to lab development for the Foundations of IoT module running next year.

Budget

The majority of the budget would be to support the intern. This is estimated at £1600 for 4 weeks (figure from Dr Andritsch who organises ECS interns).

On top of this we would need some consumable money to spend creating the nodes, including sensors, solar cells, PCBs, enclosures. Based on last year's development, this will be at most £400 but this should allow us to make more than the minimum number of devices (2)