# What is Talk2Lab?

- Project initiated by Prof. Jeremy Frey

- Interaction with a research environment

- Use of commodity technologies

- Simple interaction through natural language

Our Research Environment

- Physics Laser lab

- Highly safety conscious environment

- Hosts a variety of experiments of multiple beam lines

- Large number of instruments

- Safety critical, environmental and experimental systems
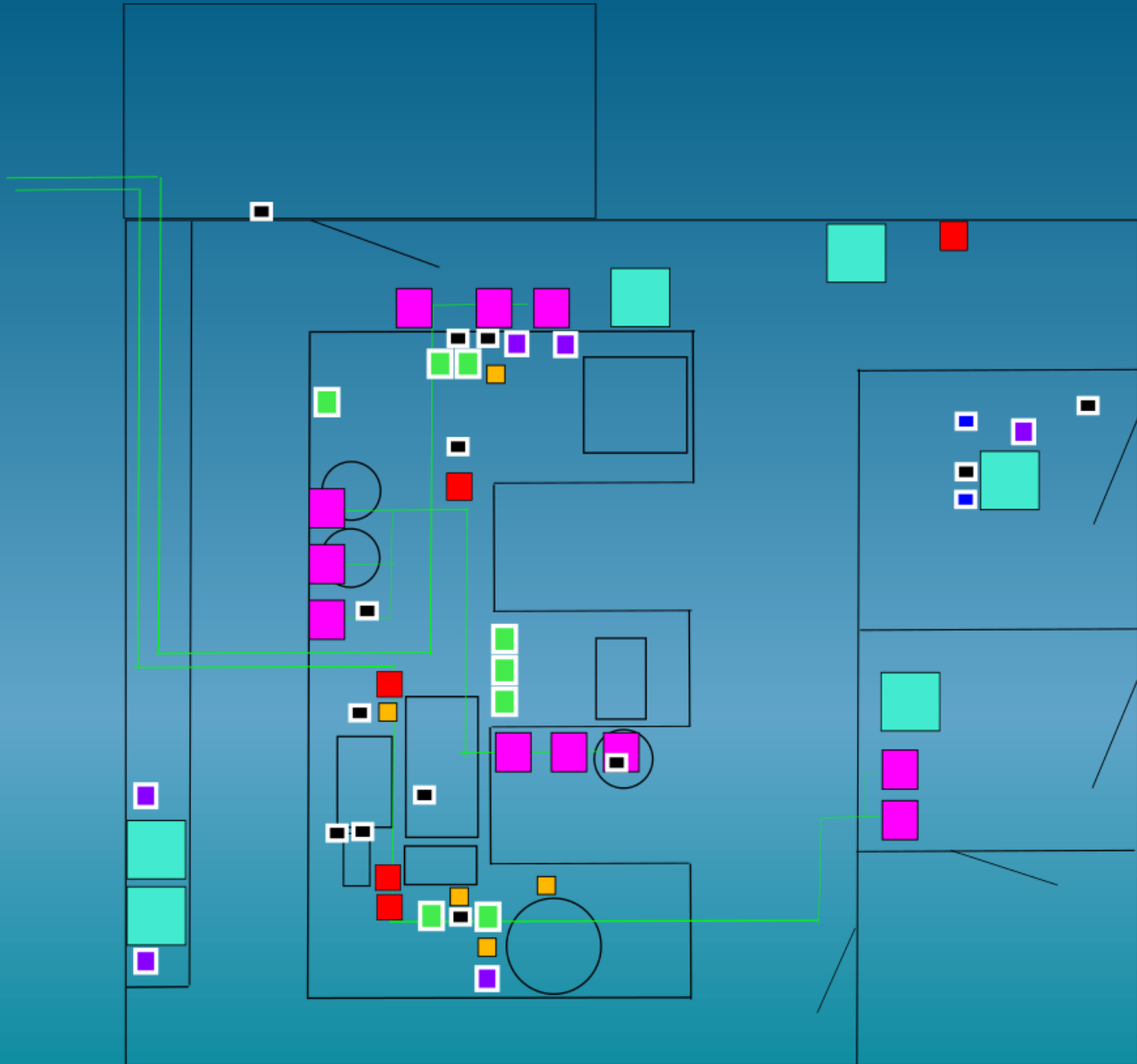
Sensor Systems

- Various sensor systems exist within the lab environment

- Temperature, flow, current cost, vacuum pressure, laser power, beam alignment

- Controlled by Raspberry Pis, Beaglebones and custom controllers

- Logs data to our custom databroker system

Talk2Lab Meetings

- A series of multidisciplinary meetings running from December to March

- Attended by colleagues from University of Southampton and external collaborators.

- Funded by EPSRC Institutional Sponsorship Research Collaboration, Physical and Digital Sciences South

- Discussions on technical aspects of interacting with the lab and trying it out with practical sessions.

Meeting Outcomes

- Implementation of proof-of-concept

- Requests processed by Alexa for temperature and laser power

- Vacuum pressure gauges added to the system

- Use cases and cataloguing the lab equipment

Technologies
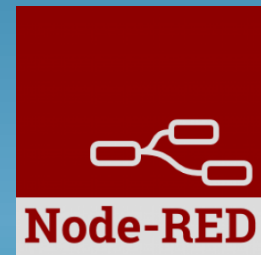
Demo

Data Considerations

- All our MQTT messages are within the SOTON domain firewall

- No interaction with safety critical systems

- Data is not publically available

    - A full skill or subset skill could be published for public engagement

- Data validity – how do you know the data is good?

Further Integration

- Allow slack input requests
  - Analyse with natural language processing

- Additional intents to process requests about the state of something

- Trigger alerts for out of spec situations detected by the sensors

- Display of network cameras

The Next Steps

- Integration of further sensors
  - Beam positioning, vacuum pressures, flow rates, current cost meters

- Processing data 'on the fly'

- Dashboard for sensor systems

- Link data to ELN systems
  - Record sensor data during an experiment

Thank you for listening

Any Questions?