



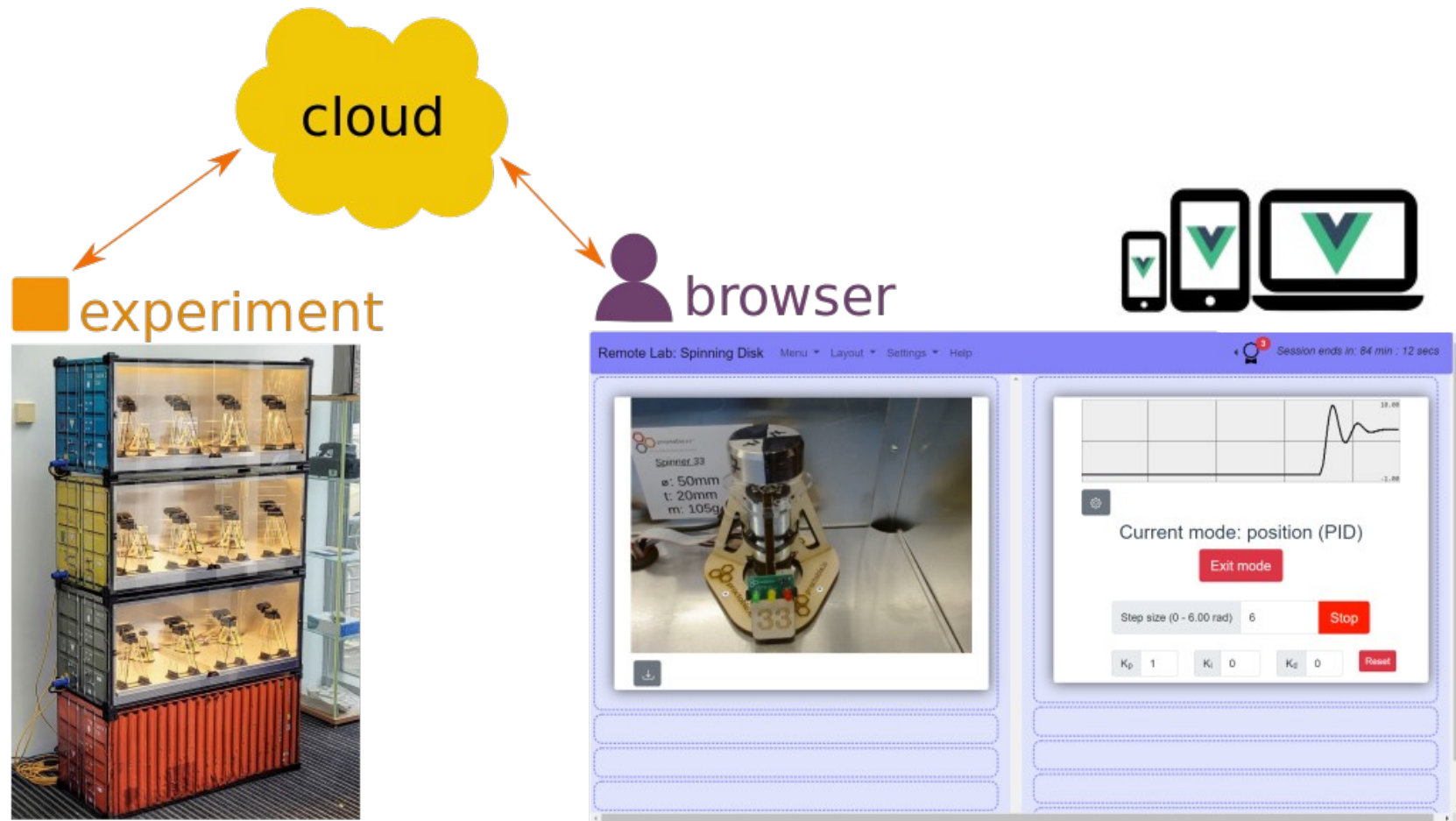
# Remote Laboratories in Education



THE UNIVERSITY  
of EDINBURGH

Contact: Prof Timothy Drysdale  
Chair of Technology Enhanced Science Education  
[timothy.drysdale@ed.ac.uk](mailto:timothy.drysdale@ed.ac.uk)

# Real equipment



**Real-time interaction  
(control kit, collect data)**



# Campus locations



Generation 2  
Alrick Foyer



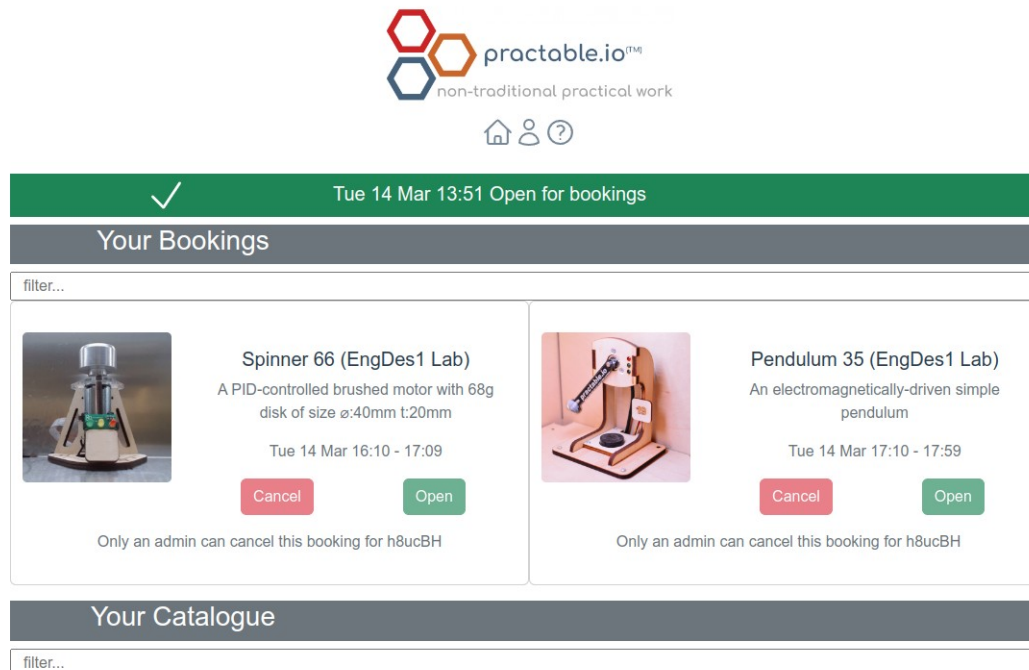
Generation 2  
AGB Foyer



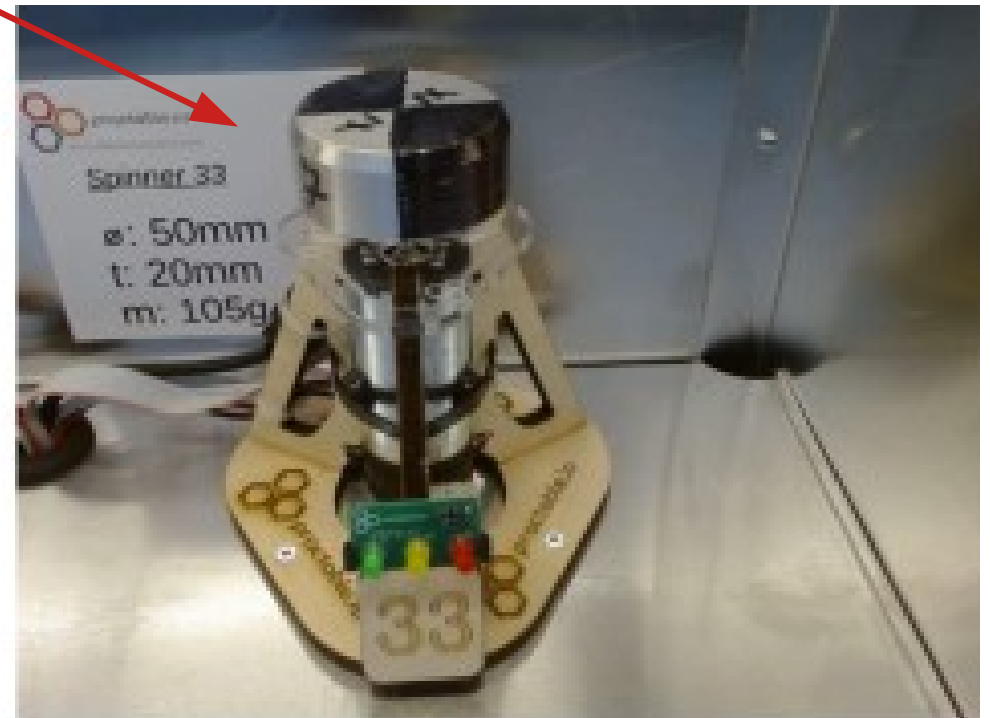
Generation 1 – JCMB 2.2417  
(photo from when they were in CR2)

# Booking system

- New for 2023:
  - Bookings can be made in advance & cancelled
  - Bookings can be pre-prepared for in-person labs
  - Custom policies manage access times and usage

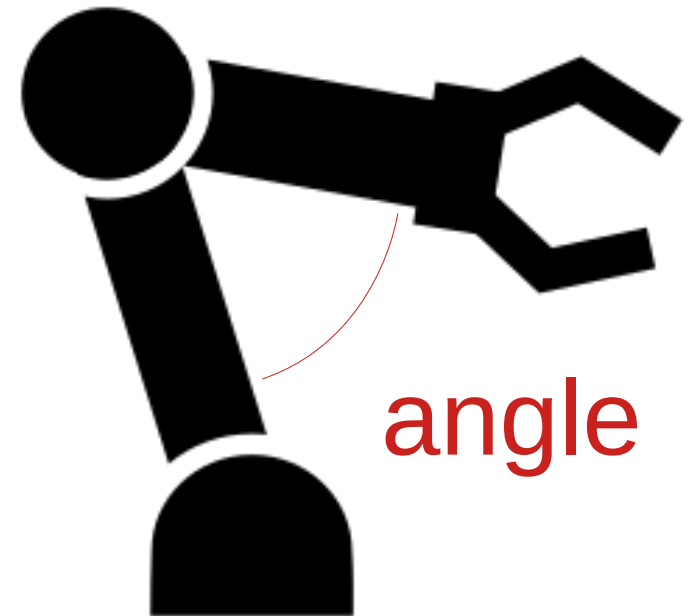
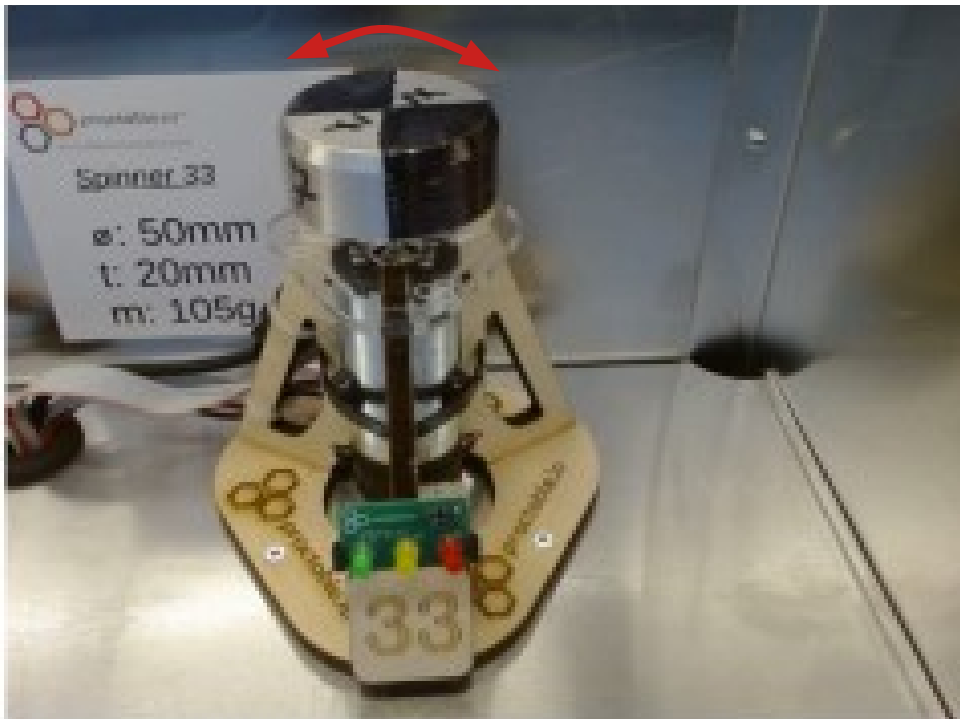


*Example of a pre-booked 2hr session with 2x experiments (1hr each)*



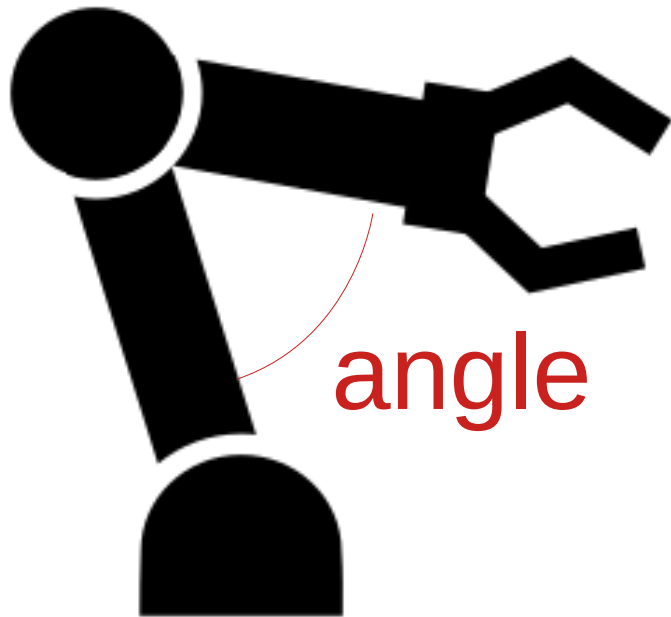
# Example experiment

angle

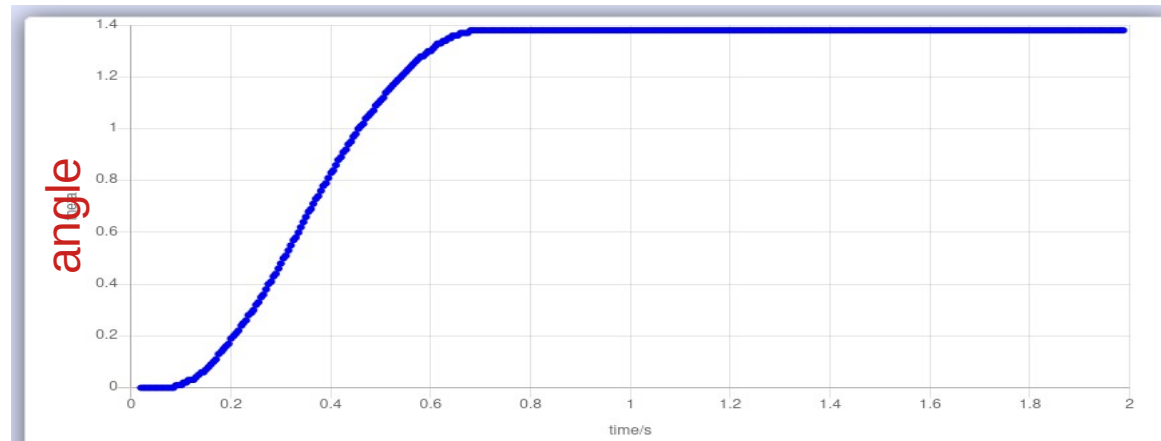


angle

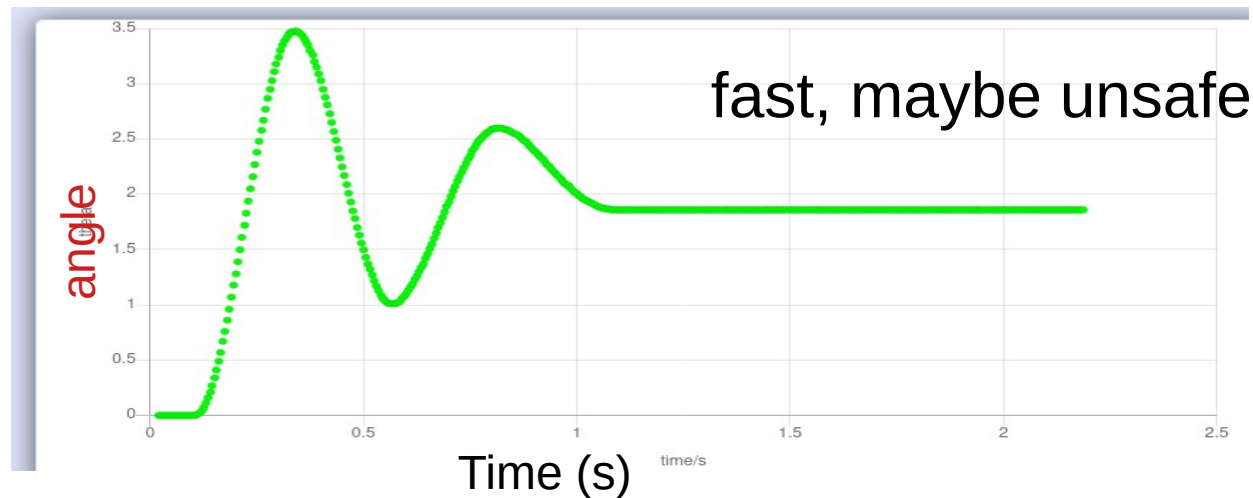
# Example experiment



Safe, maybe too slow

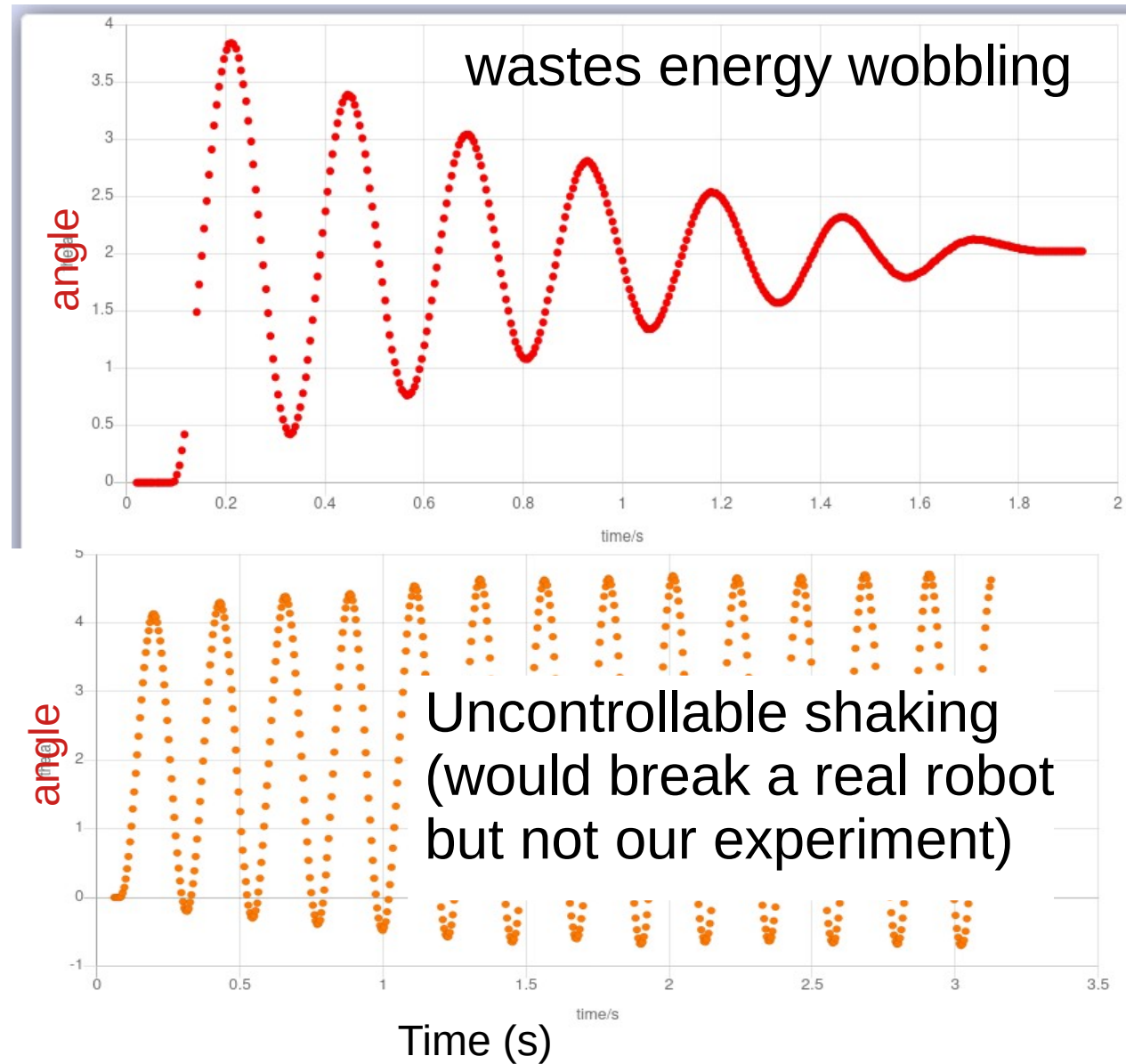
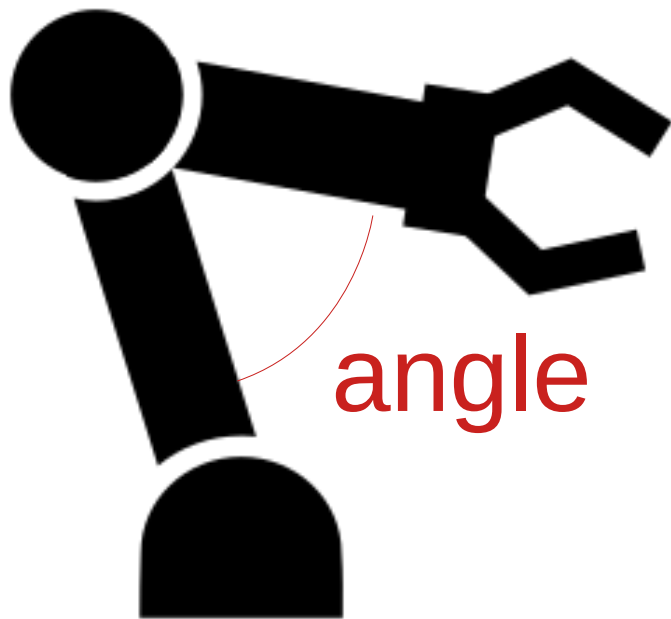


fast, maybe unsafe





# Example experiment





**Prepare graduates for**



global teams

# Prepare institutions\* for



# the future!

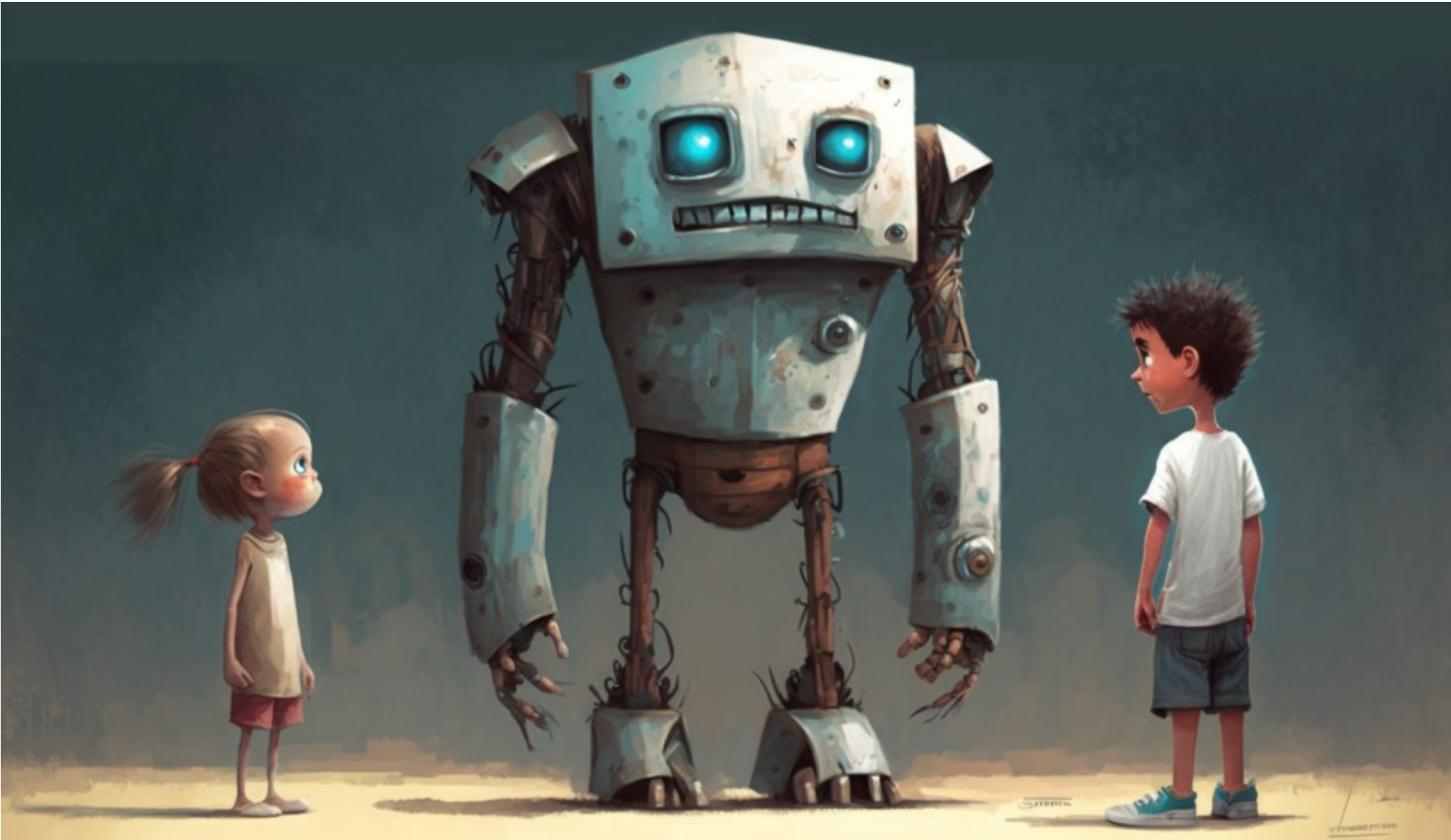
\*and students

Online *complements*;

does NOT replace in-person



# Generative Artificial Intelligence – ban or embrace?





# Digitally-mediated activities

**rich data stream**

An aerial photograph of a city at night, with the city lights visible. Overlaid on the city is a complex network of glowing orange lines that connect various points, creating a web-like structure. The lines are bright and have a slight blur, giving a sense of movement or data flow. The background is dark, making the orange lines stand out prominently.

**cost-effective to assess process**

Adopt **critical post-humanist** approach  
mixing both humanity & technology:

- a sum greater than the parts,
- not bound by the limits of either

We're not using technology,  
we're ***collaborating*** with it:  
co-development with pedagogy  
becomes natural

[bit.ly/tdd135](http://bit.ly/tdd135)



# A free and public digital infrastructure for education is a human right

– paraphrasing UN Spec. Rep. A/HRC/50/32





David Reid  
PhD student

Investigating  
effect of  
automated  
feedback  
on interaction





Sijie Zhou  
PhD student


Investigating  
hybrid  
experiments  
for increasing  
exploration

# Engineering Education (Remote Laboratories)

University of Edinburgh > School of Engineering

 Prof T Drysdale, Dr T Stratford, Dr J Terry

 Applications accepted all year round

 Funded PhD Project (Students Worldwide)

Edinburgh

United Kingdom

Data Analysis

Electrical Engineering

Electronic Engineering

Operational Research

## About the Project

Applications are invited for a PhD in Engineering Education based in the Remote Laboratories activity led by Prof Tim Drysdale, Chair of Technology Enhanced Science Education, School of Engineering, University of Edinburgh. The co-supervision team comprises Prof Tim Stratford, Personal Chair of Civil Engineering Design & Dean of Learning and Teaching College of Science and Engineering, and Dr Jonathan Terry, Course Organiser for Engineering Design 1, School of Engineering.



THE UNIVERSITY  
of EDINBURGH

### > About the Project

Funding Notes

References

 Email institution



Institution  
website



Add  
to  
shortlist



Institution  
profile

## New posts dedicated to remote labs



Andrew Brown  
0.5 FTE  
Mechanical Designer



Imogen Heard  
0.5 FTE  
Electronics Designer



# Spinners

2 containers  
8 experiments  
cloud services  
& support

cloud



*Please contact us for information on what we can offer, and up-to-date pricing*





# Acknowledgements

- David Reid – User Interfaces & Course Liaison
- Andrew Brown – Mechanical Design
- Imogen Heard – Electronics Design
- Technical Services: S. Morgan, C. Sturgeon, C. Melrose, I. Gold, A. Christie, S. Gourlay
- IT Services: F. Miller, B. Duncan, P. Sokolowski, E. Duborg
- Course organisers, staff, T&Ds & interns:  
A. Kiprakis, M. Merlin, T. Reynolds, M. Dias, S. Podilchak, J. Terry, B. Peterson, A. Don, I. Shahzadi, A. Ahmad, M. Kuznetsov, J. Welsh, C. Zsolt, B. Manapoty, C. Eralp, L. Ni Chobhthaigh, M. Noonan, & J. Yi.
- Funding from the School of Engineering