

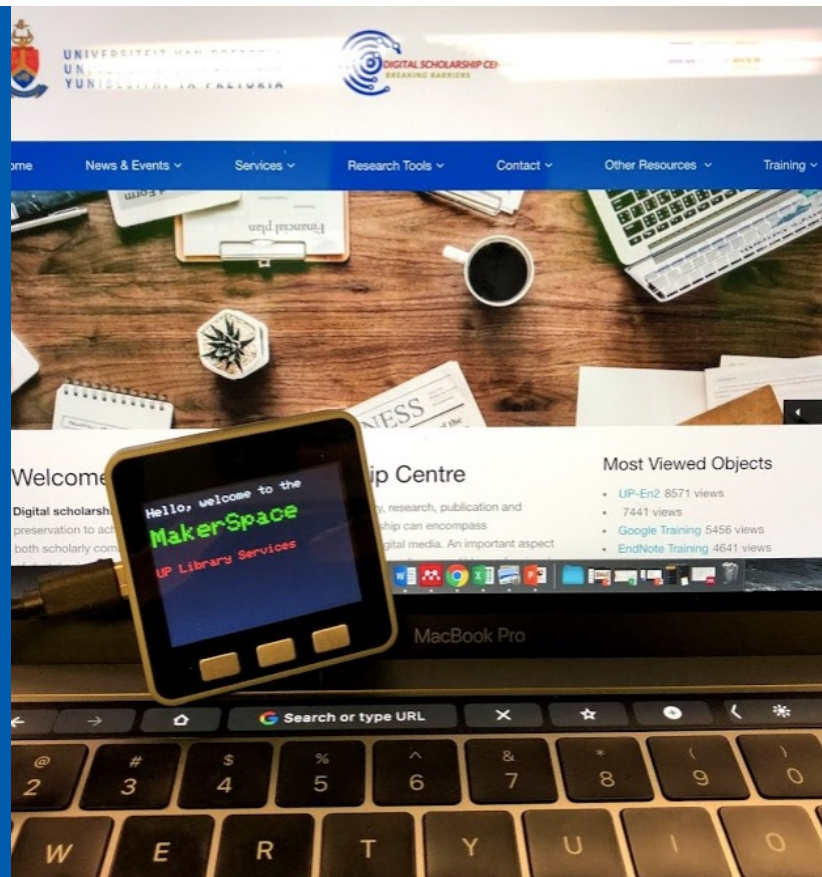


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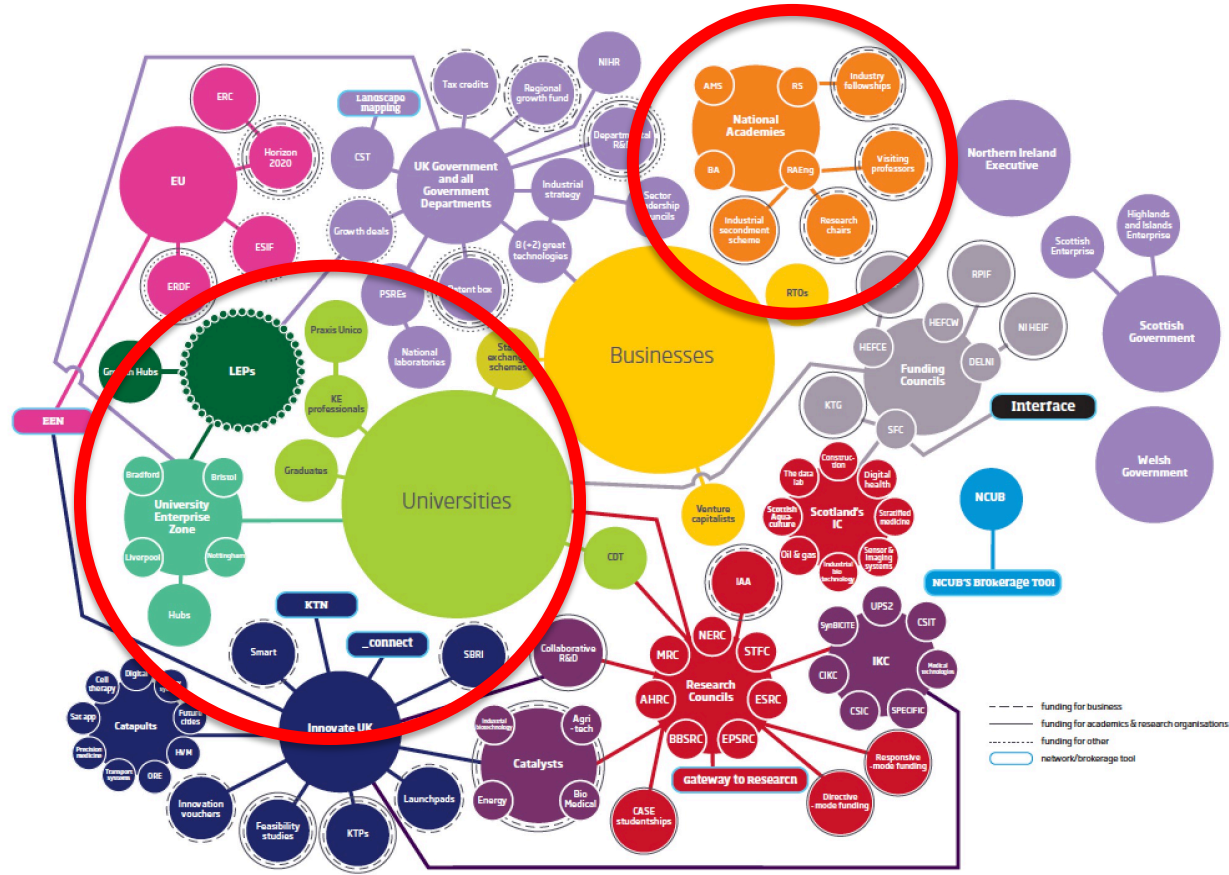
Makerspace's Role in the Innovation Landscape

Application of rapid prototyping in higher education

Sean Kruger



Innovation Landscape Today



(World Economic Forum, 2018b)

Higher Education Clientele



Higher Education Clientele



Innovation Spaces in Higher Education



- **Various forms**
- Support mechanisms that foster innovation
- Varying roles of support and outputs



Innovation Spaces in Higher Education

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Innovation Spaces in Higher Education

- Various forms
- Support mechanisms that foster innovation
- **Varying roles of support and outputs**

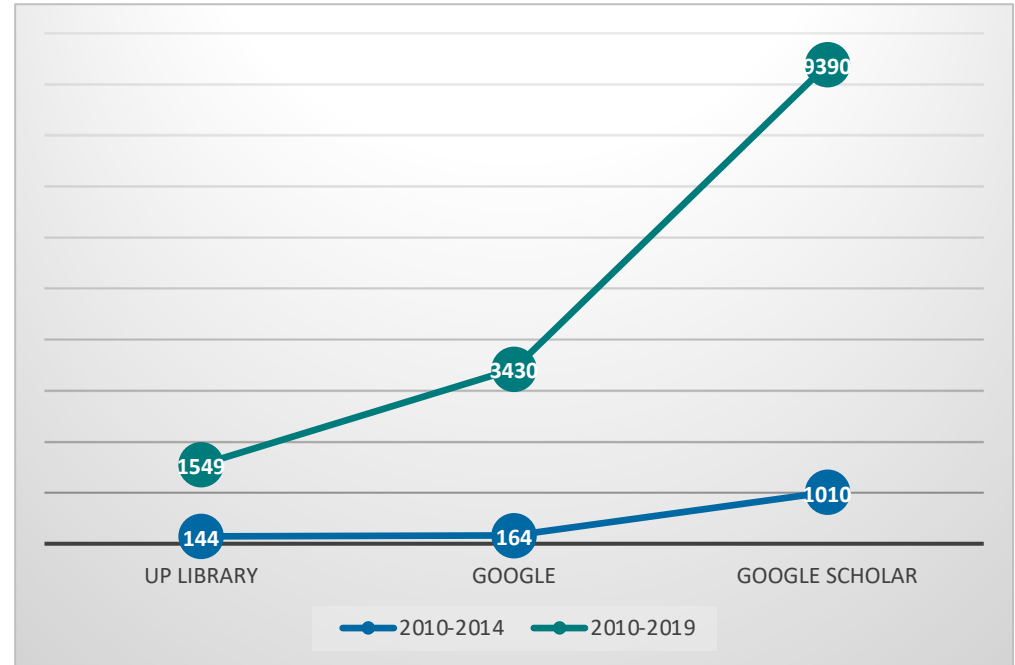
Makerspace Role in Supporting Teaching and Learning

- Openness towards thought provocation
- Non-threatening environment
- Cross-disciplinary nature
- Access to rapid prototyping technology
- Expertise and consultation



Makerspace Developments 2019

- Research on Makerspace culture and usage
- 2010-2014
 - UP Library: 144
 - Google Scholar: 1010
 - Google: 164 k
- 2010-2019
 - UP Library: 1549
 - Google Scholar: 9390
 - Google: 3 430 k
- Snapshot as at 30/08/2019

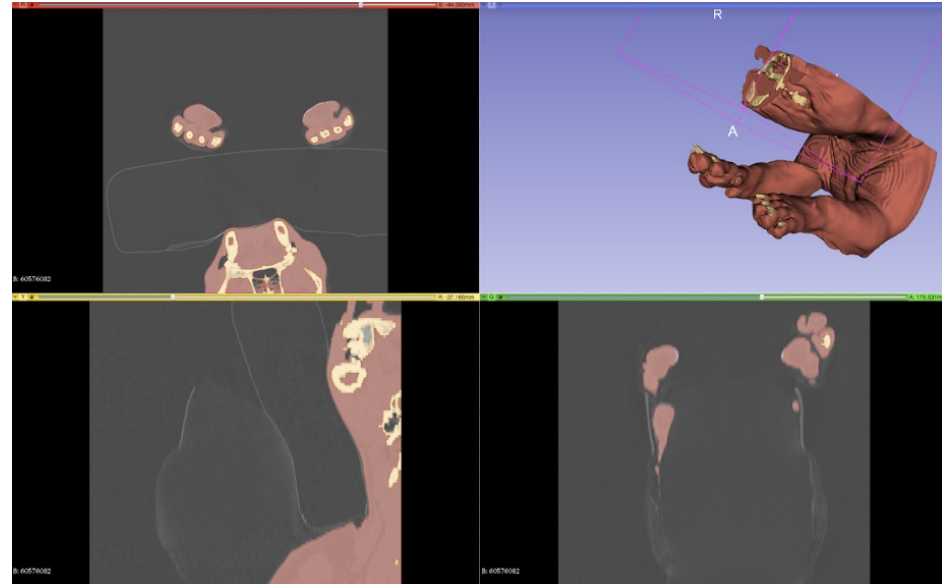
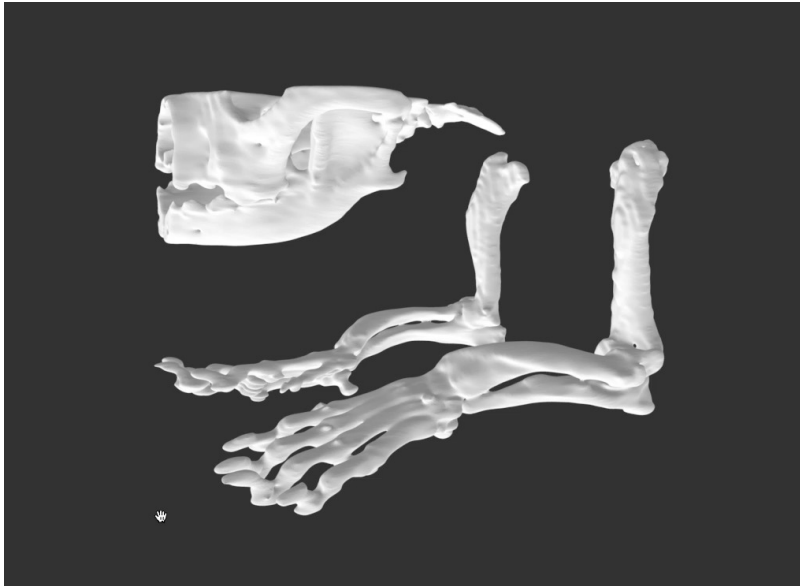


DLS Makerspace: Driving Innovation

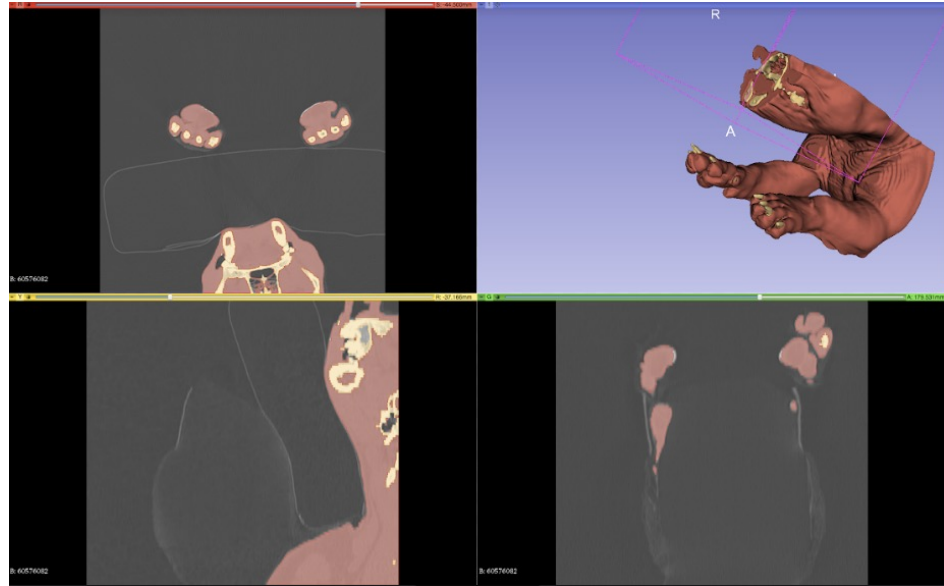


- Identify client needs (students, researchers, lecturers)
- Demonstrate technology application in various disciplines
- Rapid prototyping for research, teaching and learning
 - 3D printing (Additive Manufacturing)
 - Object creation and testing (scanning, design, making)
 - IoT Support through various technologies

Enhancing Methods in Veterinary Sciences

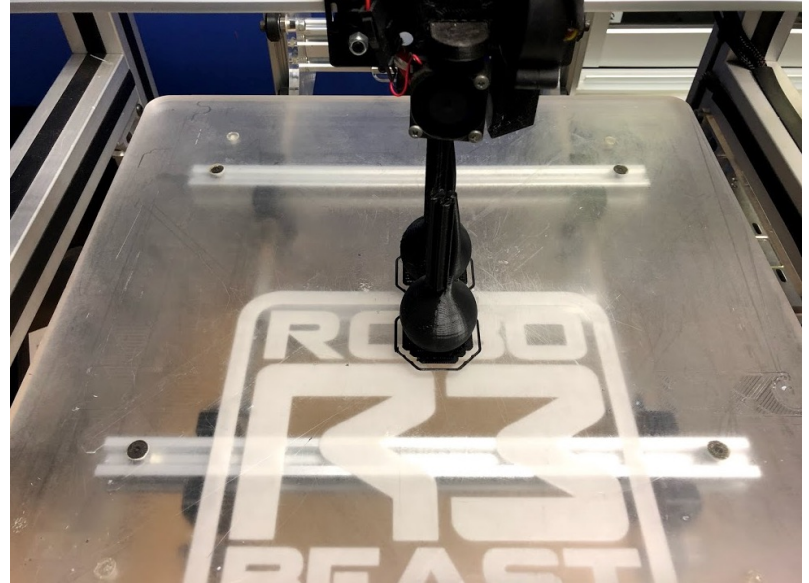
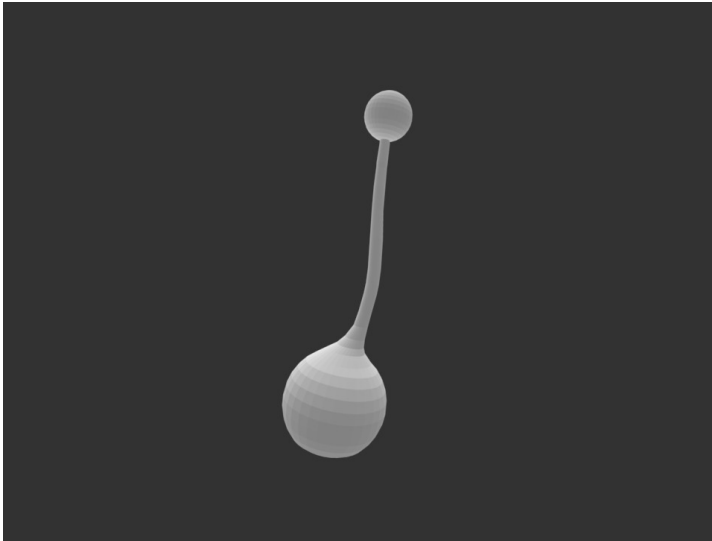


Enhancing Methods in Veterinary Sciences



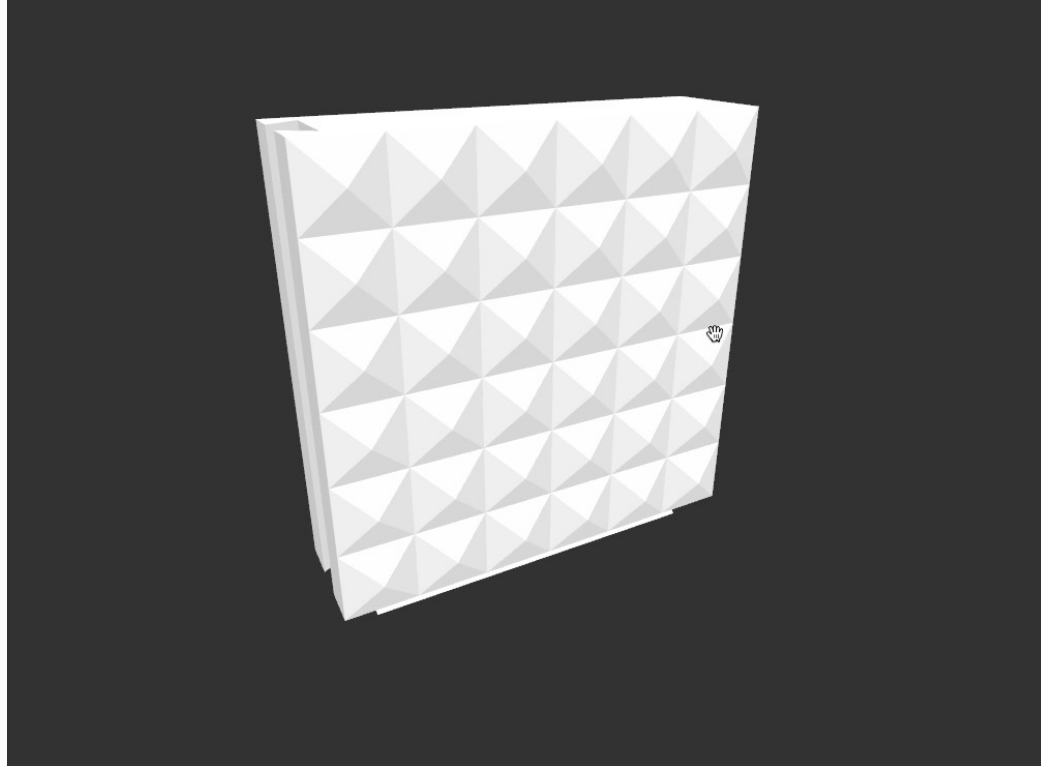
Demonstrating Complex Structures

Forestry and Agricultural Biotechnology Institute (FABI)



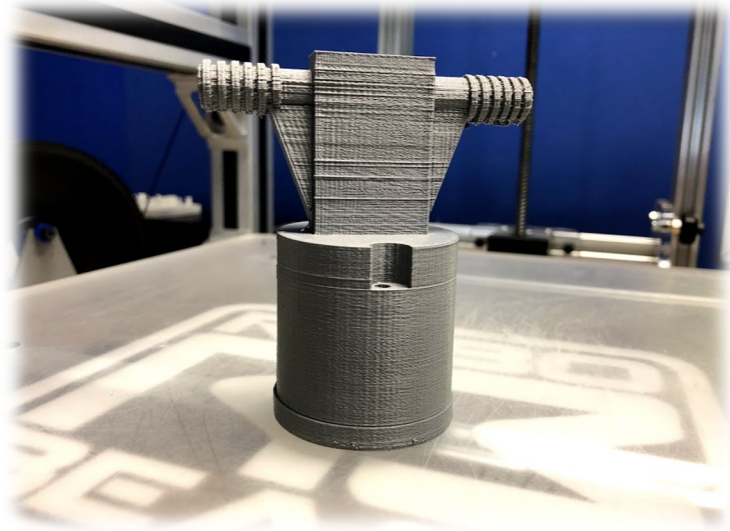
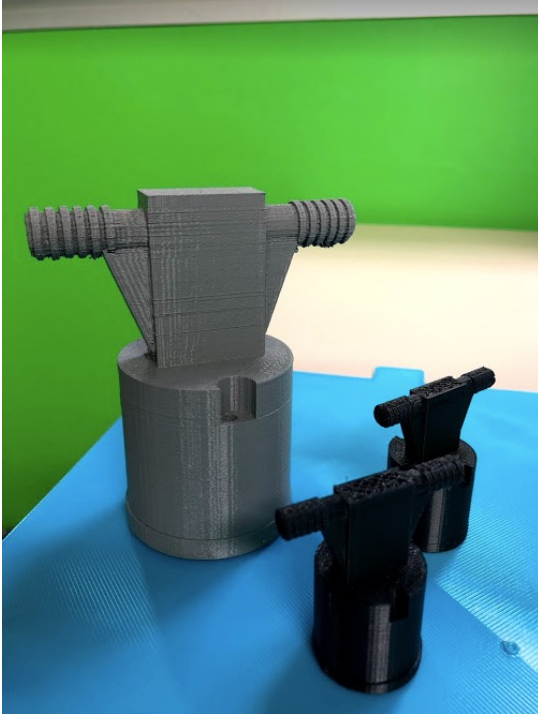
Enhancing Creativity

Department of Informatics



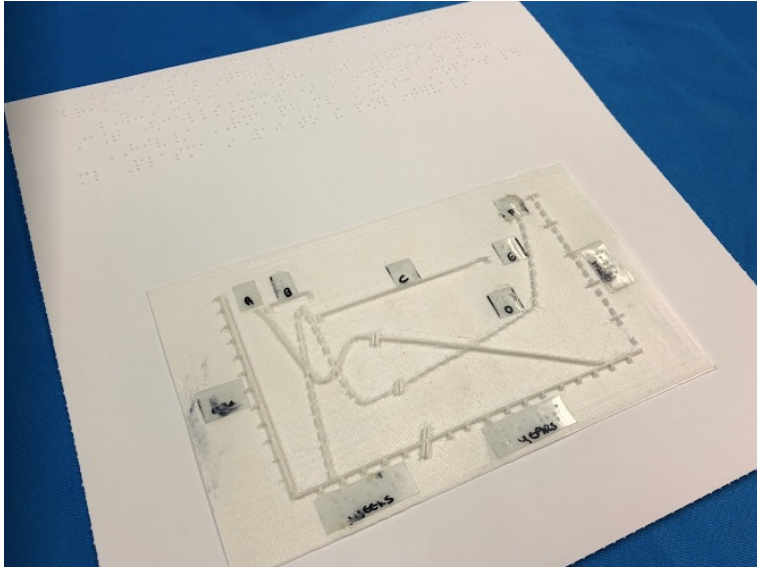
Research Across Multiple Divisions

Malaria Parasite Molecular Laboratory, a Division of Biochemistry



Making Learning Possible for All

Department of Chemical Pathology



1

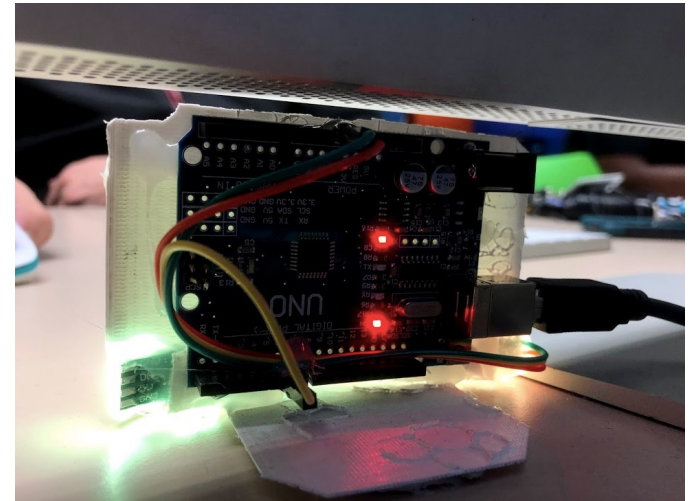
2

3

8



Creating Linkages



75% of IoT projects focus on 5 SDGs











(World Economic Forum, 2017)





Arduino: Basis for IoT Teachings


- Basic circuitry
- Bring together hardware and software
- Inexpensive
- Cross-platform
- Open source code
- Open source extendable hardware
- Customised solutions






Freud's Mother
All changes saved 










 Code
 Start Simulation
 Export
 Share





Components
Basic





- 

Resistor
Restricts the flow of electricity in a circuit, reducing the voltage and current as a result.
- 

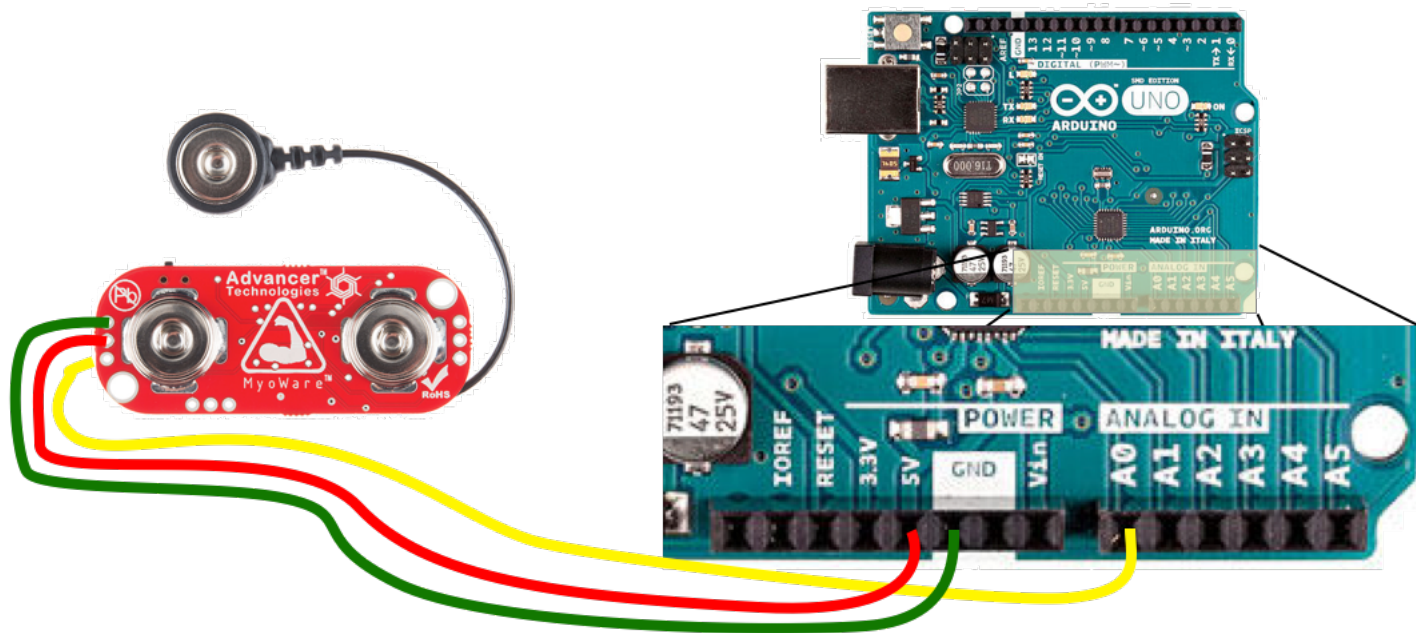
LED
Light-Emitting Diode that lights up when electricity passes through it in the correct direction.
- 

Pushbutton
A switch that closes a circuit while pressed.
- 

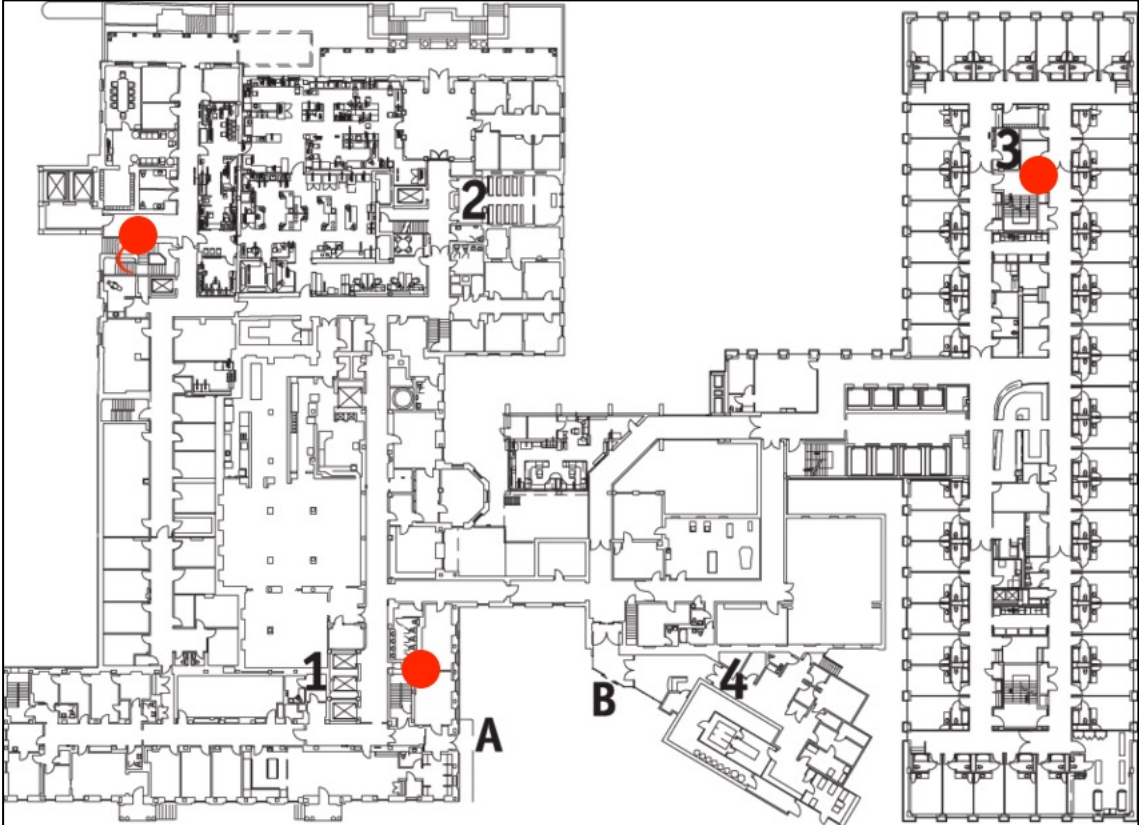
Potentiometer
A type of resistor whose resistance changes at the turn of a knob.
- 

Capacitor
Stores and releases...

IoT value creation

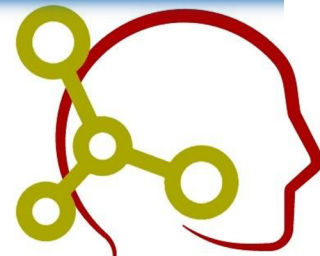


IoT value creation



Conclusion

- Innovation landscape is extensive
- Makerspace offers various services to enhance the capacity of users to innovate, teach and learn
- Various disciplines have used- and continue to- rapid prototype to enhance teaching and learning
- Why not consult your makerspace?



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University of Pretoria

Preparing our clients for
the future



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 - Prof. Birkholtz
- Department of Chemical Pathology
 - Dr. Punchoo

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