

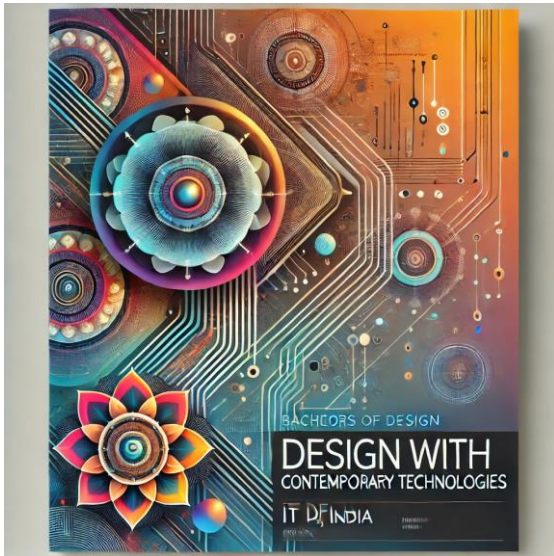


Design with contemporary
technologies
Instructor: Jay Dhariwal,
Associate Professor,
Department of Design
IIT Delhi
Date: 3rd January 2025



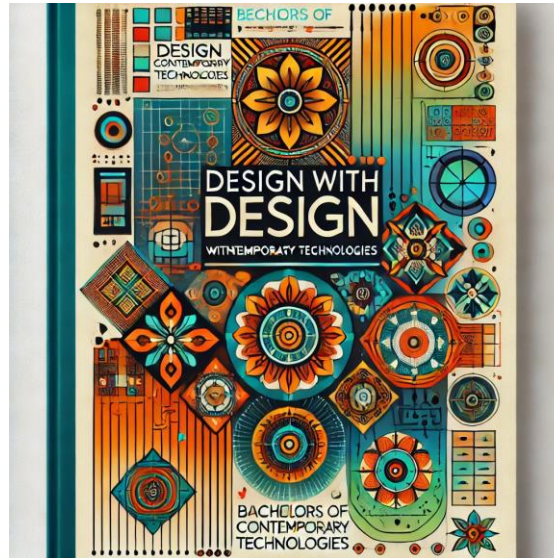


DALL-E



PROMPT

Create an image for the Cover page for "Design with Contemporary Technologies" class for Bachelors of Design students at IIT Delhi, India



PROMPT

Create an image for the Cover page for "Design with Contemporary Technologies" class for Bachelors of Design students in India



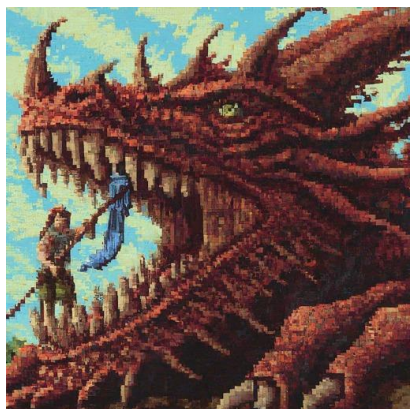
PROMPT

Create an image for the Cover page for "Design with Contemporary Technologies" class for Bachelors of Design students



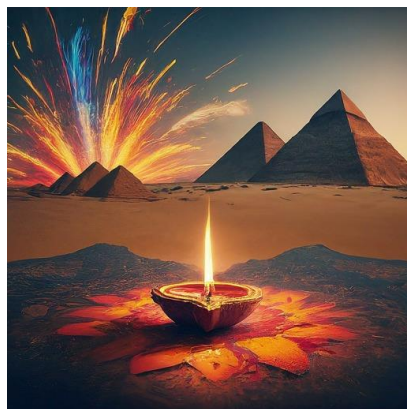
DALL-E

[Can you generate an AI image?](#)



PROMPT

Cleaning the teeth
of a dragon with a
mop



PROMPT

Generate Diwali
greeting images
being celebrated
in Egypt with
firecrackers in
foreground and
Pyramids in
background



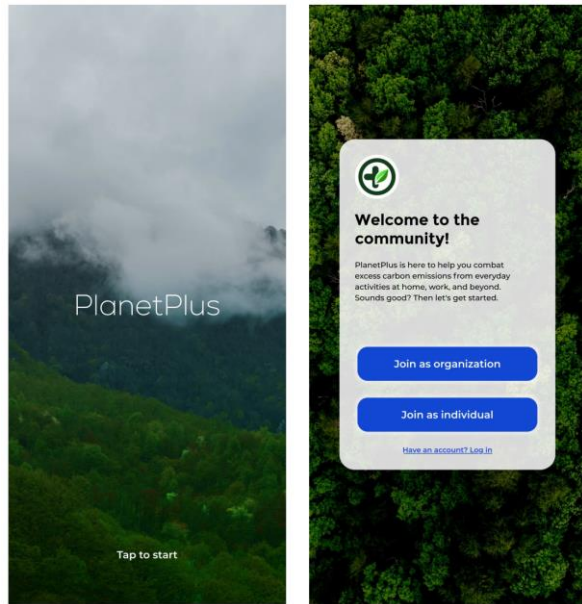
PROMPT

A scooter made of
ice to beat the
harsh hot climate
of Delhi



PROMPT

Create an image
of a majestic
gorilla in a desert
landscape



Abhishek Katakwar App,
Solar Decathlon Europe - Team Shunya



AR from Prof Charu Monga's group



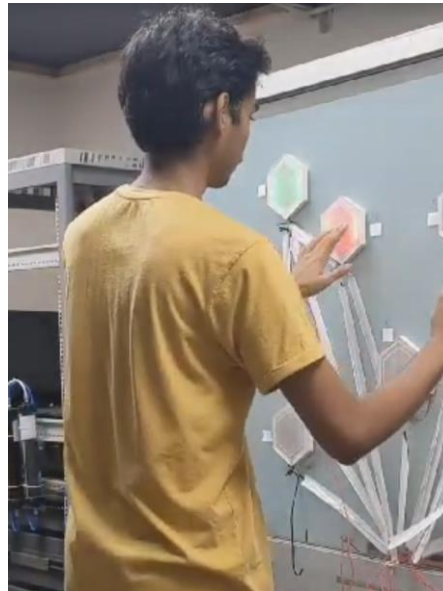
Design with contemporary technologies, DDL 124 (Spring 2023)



Design with contemporary technologies, DDL 124 (Spring 2024)



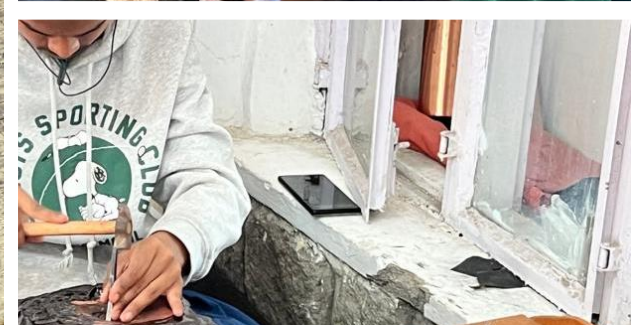
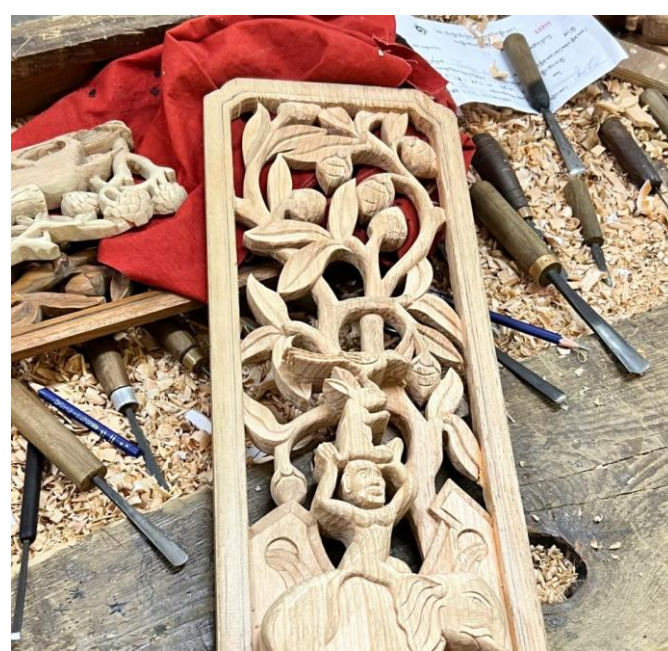
Posture sensing



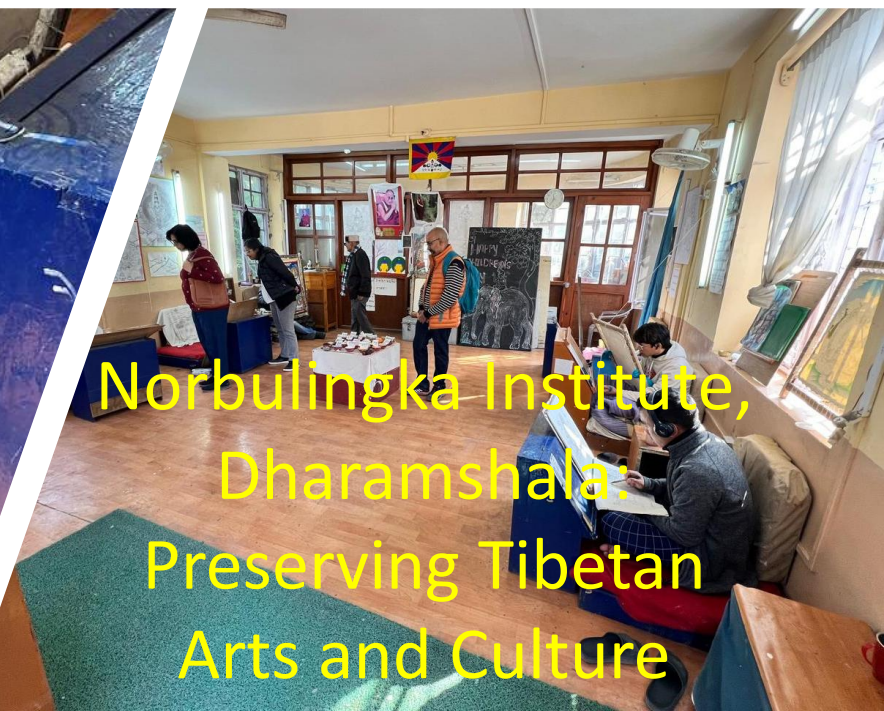
Reflexes of pilots



No. of occupants detection



What Technology is this?



Norbulingka Institute,
Dharamshala:
Preserving Tibetan
Arts and Culture



How about this
Technology?





Golabadi Village visit through
Shivganga Foundation, Jhabua

Technology is the use of knowledge and tools to solve problems, improve lives, and achieve goals: [🔗](#)

Definition

Technology is the practical application of knowledge to create something new or do something in a new way. [🔗](#)

Examples

Technology includes simple tools like hammers and wheels, as well as complex systems like computers and the internet.

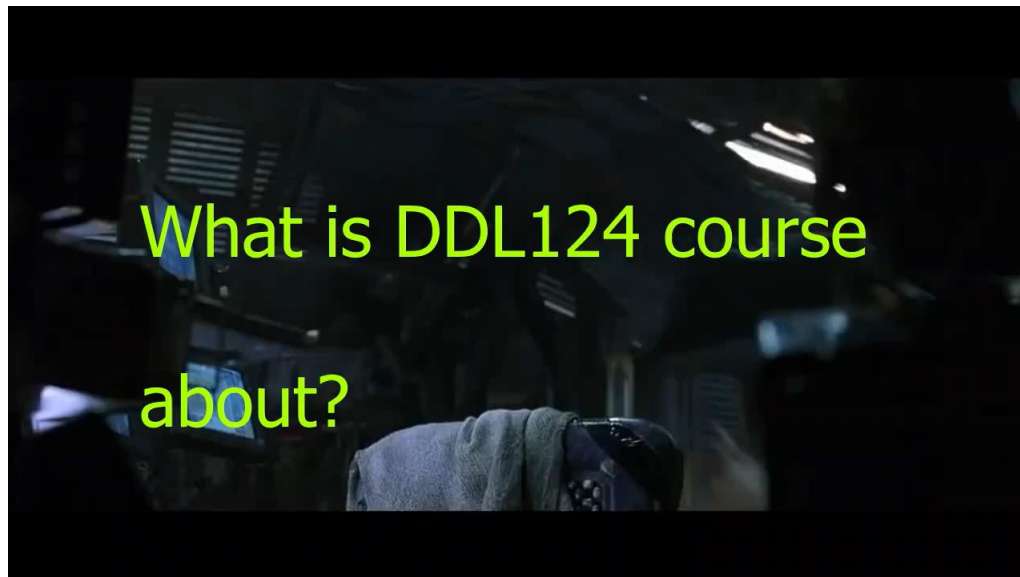
Role

Technology plays a critical role in science, engineering, and everyday life. It enhances productivity and transforms lives. [🔗](#)

Products

Technology can refer to the products resulting from these efforts, including both tangible tools and intangible ones like software. [🔗](#)

What is
“Design with
contemporary
technologies”
about?



Fast learning, Rapid prototyping, Use tech for applications

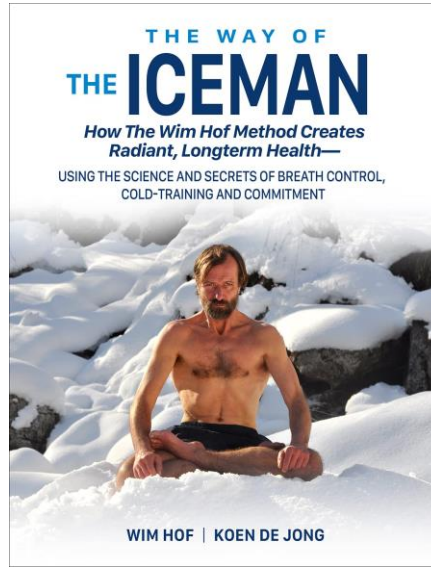


Can we think of a solution *to keep a person warm in winters?*





A Buddhist monk in Normandy, France. During meditation, the monk's body produces enough heat to dry cold, wet sheets put over his shoulders in a frigid room (Photo courtesy of Herbert Benson).



Harvard Gazette: Meditation changes temperatures. (2002). <http://www.hno.harvard.edu/gazette/2002/04.18/09-tummo.html>

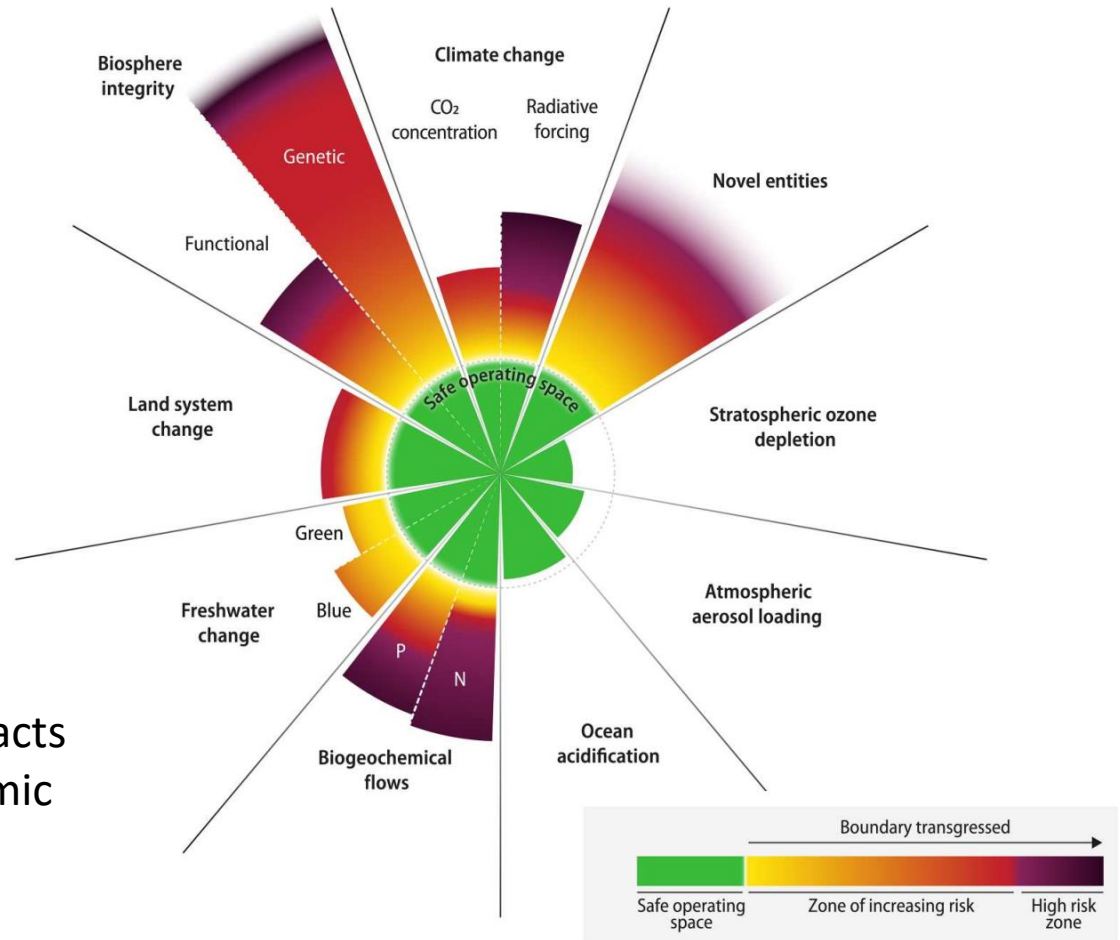
Ledford, H. (2014). Behavioural training reduces inflammation. *Nature*. <https://doi.org/10.1038/nature.2014.15156>

Kox, M., van Eijk, L. T., Zwaag, J., van den Wildenberg, J., Sweep, F. C. G. J., van der Hoeven, J. G., Pickkers, P. (2014). Voluntary activation of the sympathetic nervous system and attenuation of the innate immune response in humans. *Proceedings of the National Academy of Sciences of the United States of America*, 111(20), 7379–7384. <https://doi.org/10.1073/pnas.1322174111>

How about this? Is this a contemporary technology? Is this acceptable? Which is better – a product or a behavioural change or a mindset shift?

Environmental Sustainability concerns: Anthropocene

Anthropogenic (manmade) impacts should be considered in a systemic context.



Richardson et al. (2023). Earth beyond six of nine planetary boundaries. *Science Advances* 9, 37.

Introductions

- Myself
- TAs: QuEST Lab
(Prasannaa, Bavath,
Gulshan, Harshit)
- Aapkee Tareef? Your
thoughts on Existing to
Preferred: "Old is Gold"
or "Gold is Old" 😊?



Who Am I?

Situating “Design with Contemporary Technologies” within the BDes Program

SKILLS to be learnt

Sketching, 2D CAD

App Usability Prototyping,
Functional App Making

3D CAD, Model Making,
DIY Mechanical Prototyping

DIY Electronics Prototyping
DIY Materials, DIY Bio,
DIY Chemistry, DIY Optics

AR-VR, **AI/ML**

Crafts – Pottery, Organic Farming,
what else?



Skills and Mindsets

Getting started with AI, Functional App Making,
DIY Electronics

Learning Philosophy – How to learn? Fast Learning!

Grading Scheme

App – one assignment
(UI/UX)

Deploy AI – one
assignment

DIY electronics – one
assignment

Attendance and
Classroom Participation
Project?

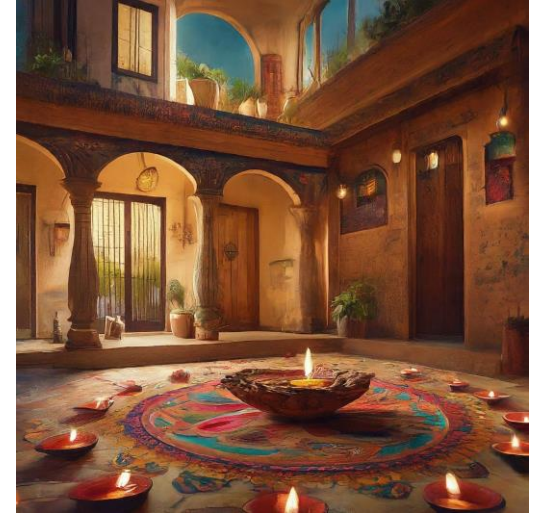


More thoughts on course pedagogy

- Design thinking – solving the right problem vs. solving the problem right?
- Design pedagogy of studio based learning, hands-on experiential learning
- From “**What** to learn to make?” To “**How** to learn to make?”
- Peer to peer learning (helping each other, each one with different strengths, very diverse class)
- Course website, curriculum and grading scheme, moodle, WhatsApp
- Instructables, DIY sites for making
- [How to Make Almost Anything](#)



Topic 1: Fun with AI



Rajat Dhariwal Talk (Aug 2024)

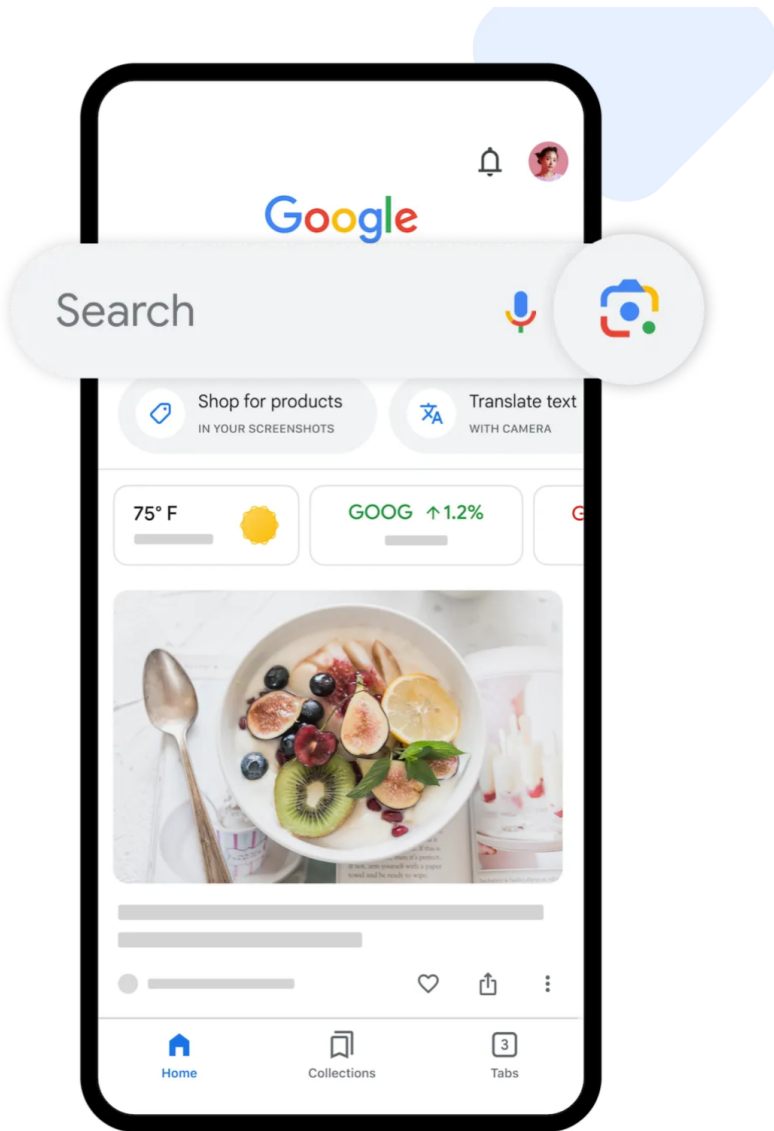
AI in Design Education

Become a 10x Designer

Have you used ML before?

- Siri, Google Assistant, Alexa.
- Amazon suggestions to buy stuff, Film suggestions on Netflix





Try Google Lens

Look for Lens in the search bar of the Google app

Scan to get the app



Google Teachable Machines

The image shows the Google Teachable Machines web interface. On the left, there are two class cards. The first card is for 'Jay' and contains 117 image samples. The second card is for 'Payal' and contains 132 image samples. Each card has a 'Webcam' button and an 'Upload' button. Below these cards is a dashed box with a plus icon and the text 'Add a class'. In the center, there is a 'Training' panel with a 'Train Model' button and an 'Advanced' dropdown menu. On the right, there is a 'Preview' panel. The 'Preview' panel has a 'Preview' tab and an 'Export Model' button. Below this, there is an 'Input' section with a toggle switch set to 'ON' and a 'Webcam' dropdown. The main part of the preview is a video feed showing a person's face. Below the video feed is an 'Output' section with two rows: 'Class 1' with a progress bar at 100% and 'Class 2' with a progress bar at 0%.

Jay

117 Image Samples

Webcam Upload

Payal

132 Image Samples

Webcam Upload

Add a class

Training

Train Model

Advanced

Preview Export Model

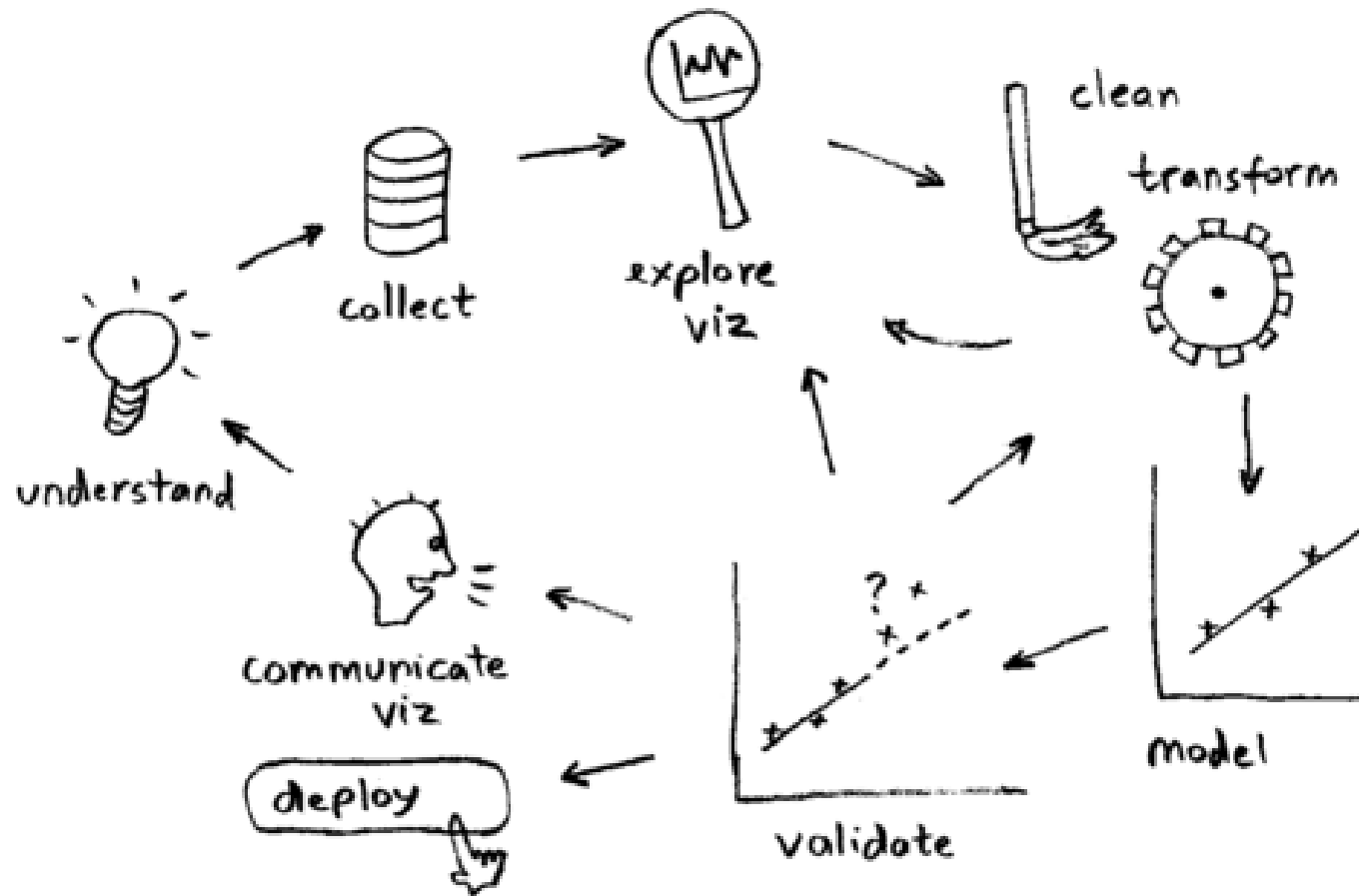
Input ON Webcam

Output

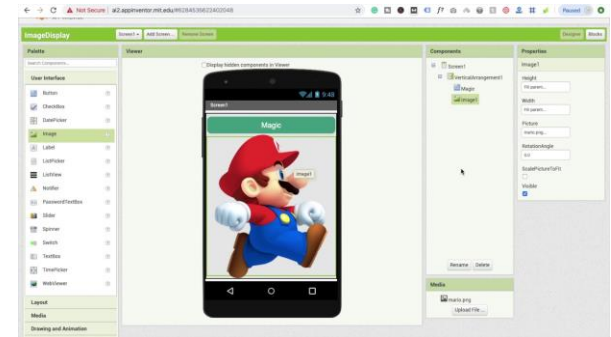
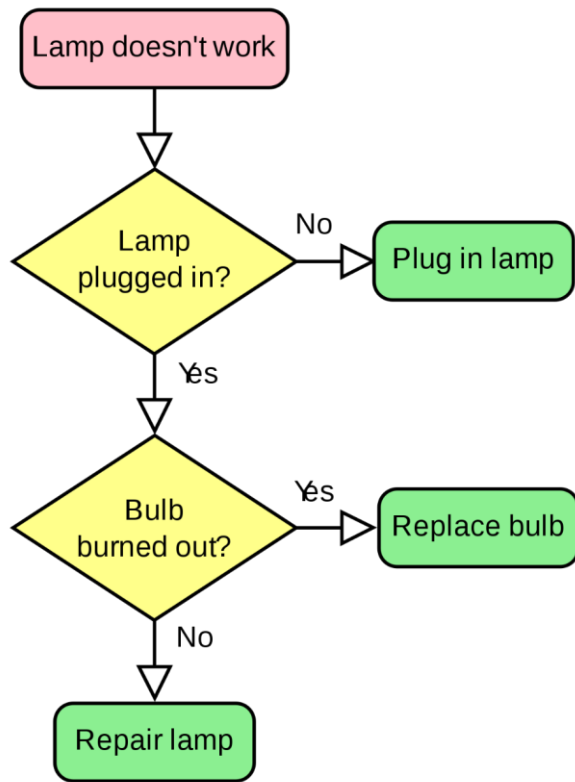
Class 1 100%

Class 2

Data science workflow



- Source: <http://datascience.la/data-science-toolbox-survey-results-surprise-r-and-python-win/>



Topic 2: Learn programming by making a functional App

Posture sensing

when Clock1 .Timer

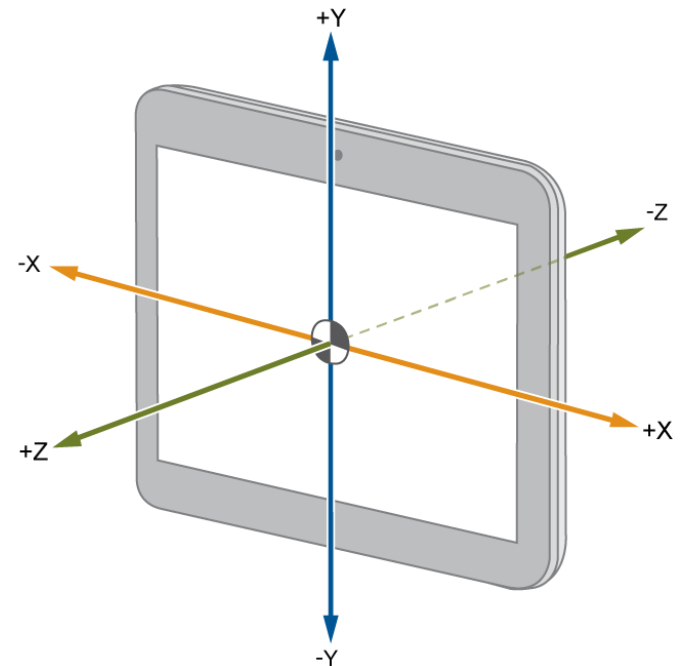
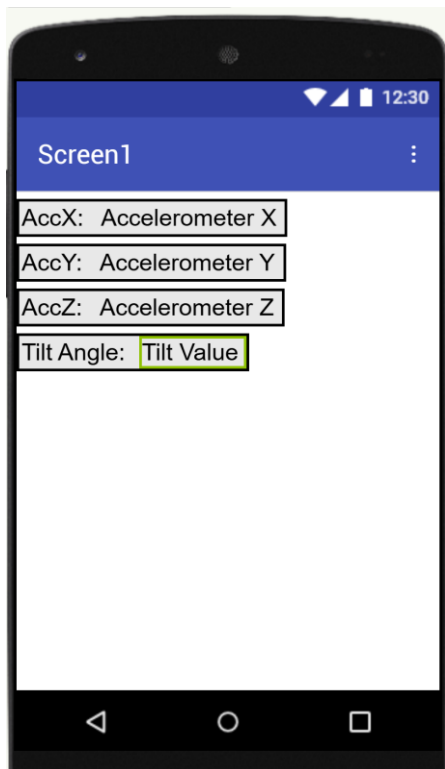
do

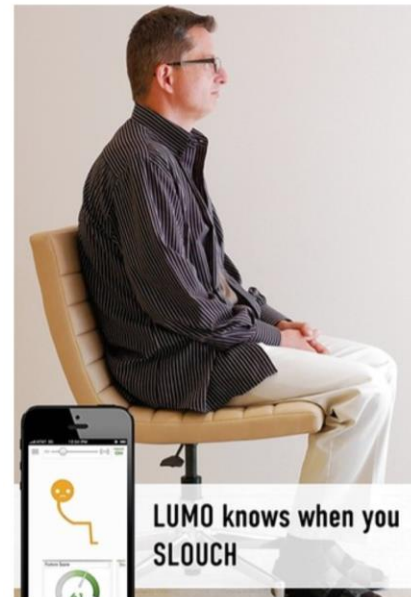
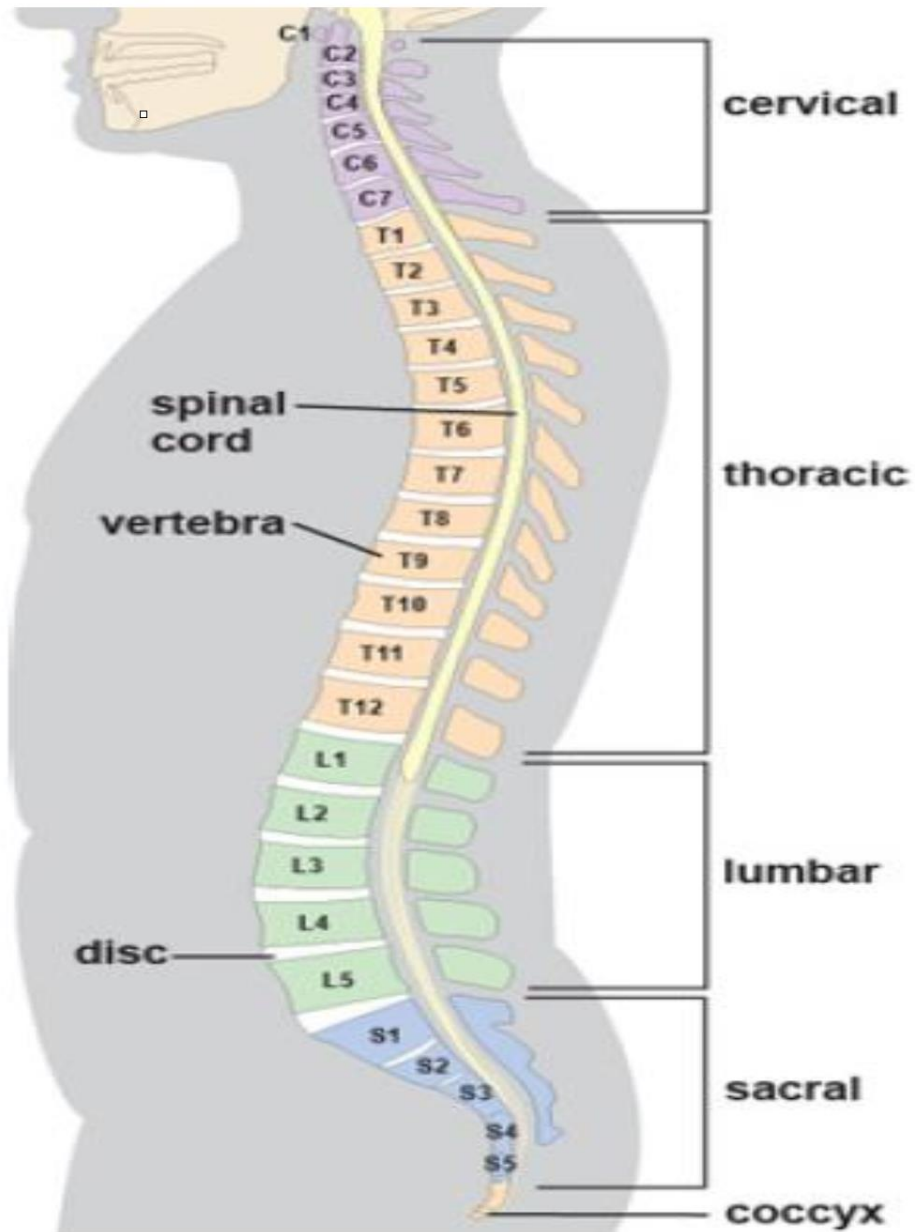
set Label5 . Text to AccelerometerSensor1 . XAccel

set Label6 . Text to AccelerometerSensor1 . YAccel

set Label7 . Text to AccelerometerSensor1 . ZAccel

set Label15 . Text to atan AccelerometerSensor1 . YAccel / AccelerometerSensor1 . ZAccel

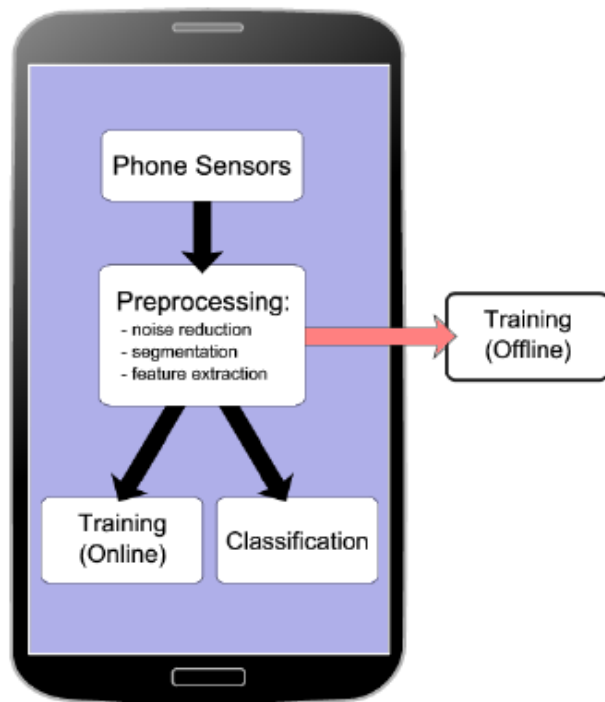




The LUMO app tracks and scores your posture, with a stick figure. It compares straight versus



Human activity recognition



doi:10.3390/s150102059

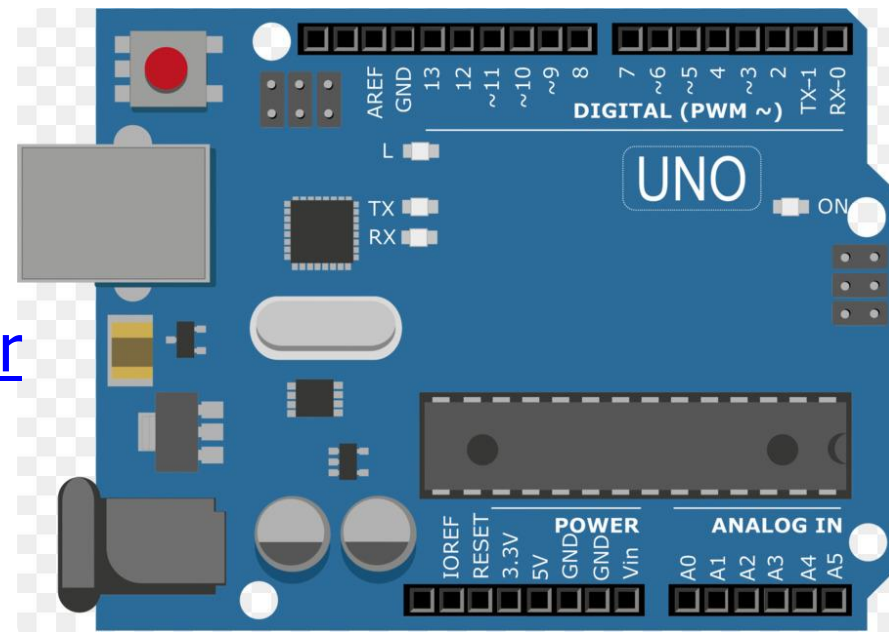


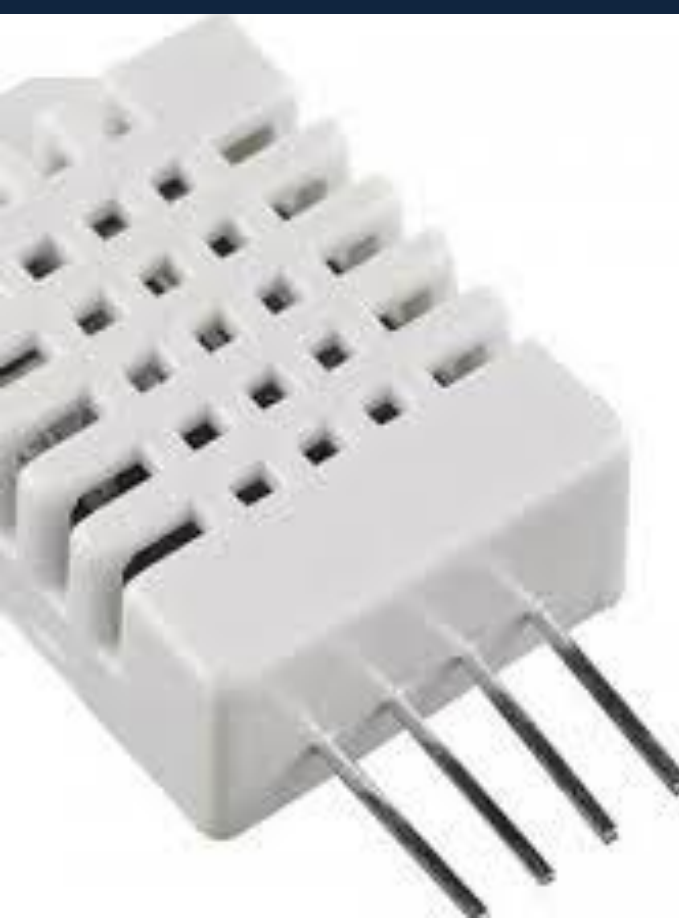
[MATLAB video tutorial](#)

[Data source](#)

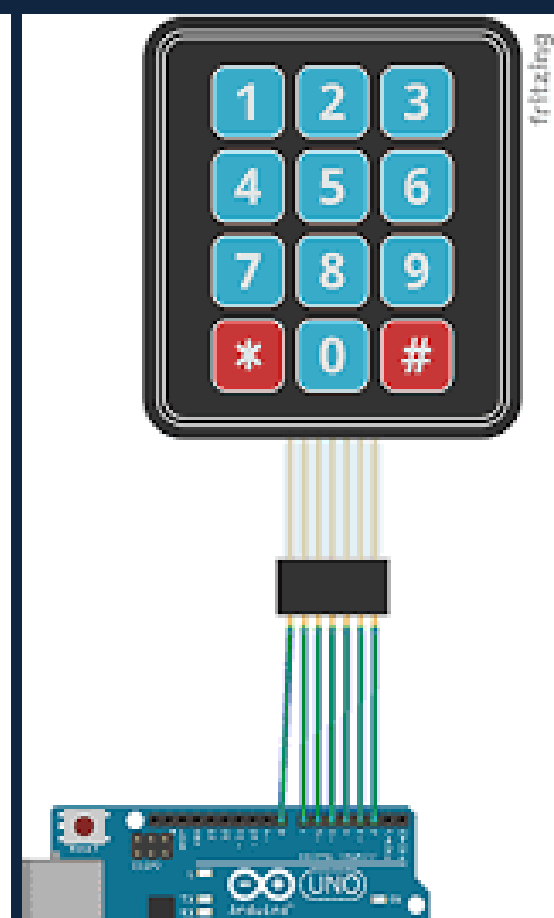
Topic 3: μ C programming

- Basics of programming, algorithm, flowcharts.
- Arduino hardware, IDE, libraries
- Arduino kit with examples
- LEDs, RGB LEDs.
- Push buttons, Buzzers.
- Electrical safety and handling
- [LED name](#)
- [Basic musical instrument](#)
- Tinkercad Simulations – [Cdr Venkat Aditya](#)

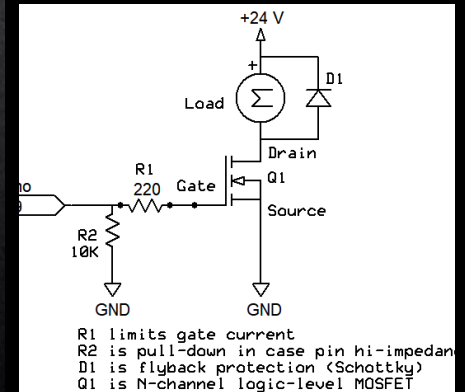
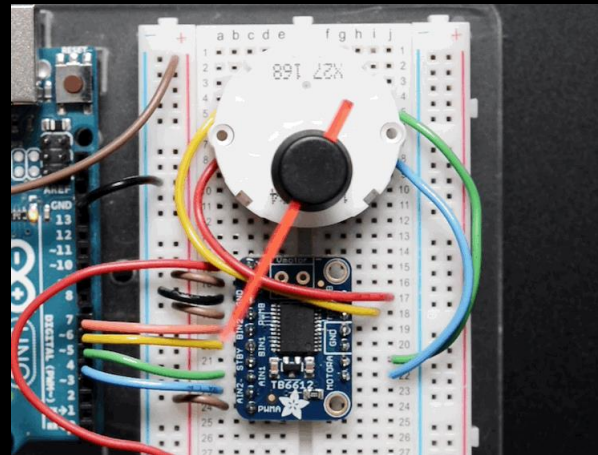




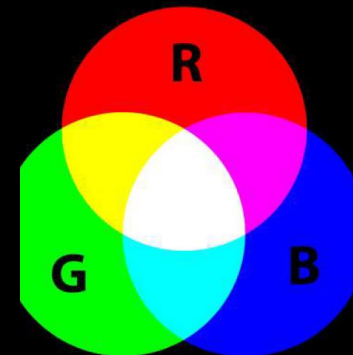
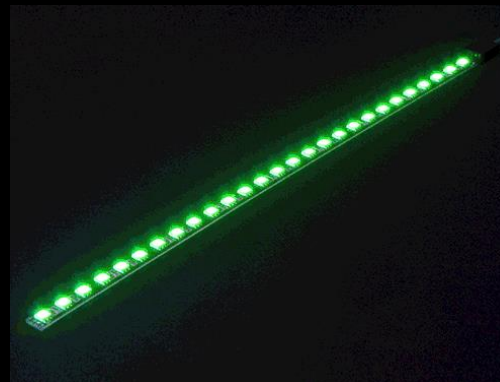
- Sensor features, datasheet
- [T+RH sensor](#), [proximity sensor](#), keypad module with μC
- Sensors in your smart phone?



- RGB LEDs, Displays, Speakers, Servo/Stepper Motors, Relays, Dataloggers
- High power electronics
- [Ultrasonic + LED display](#)
- [Pressure sensor + speakers](#)
- [All terrain robot](#)

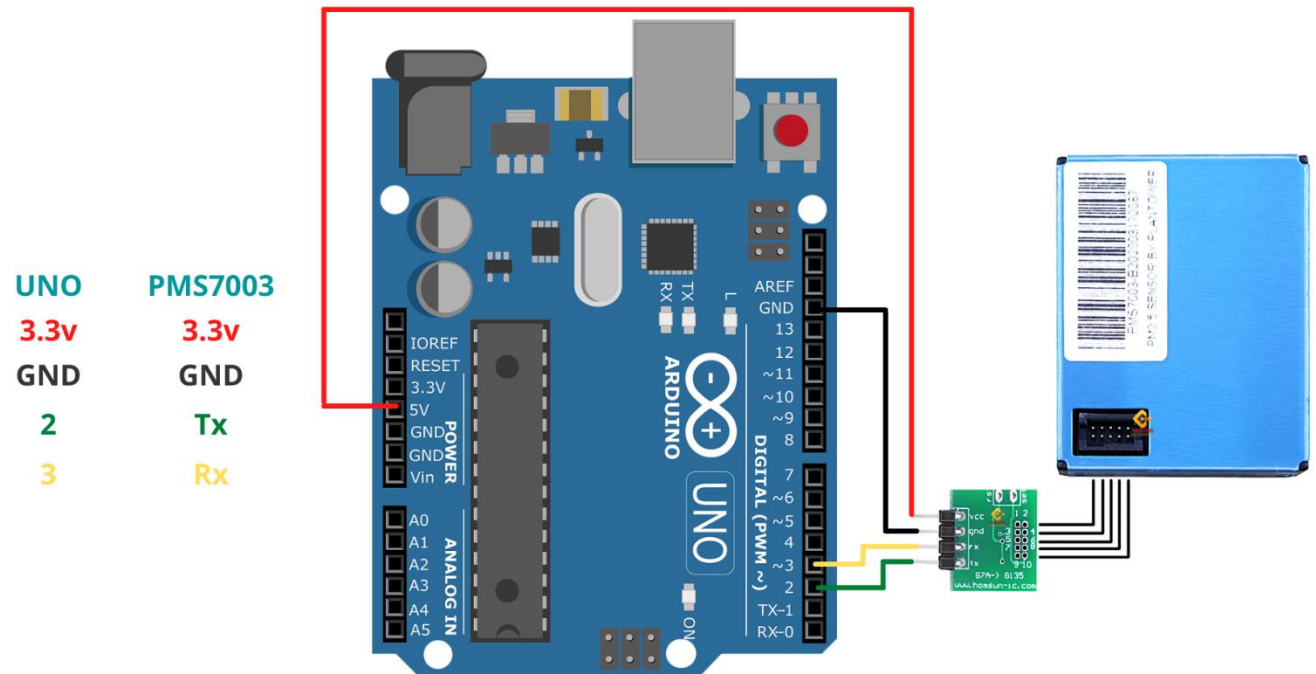


```
12:30:55 13/03/2015
Slow 0 Fast 0
Clock State Sync'd
16000298Hz GMT+0
```



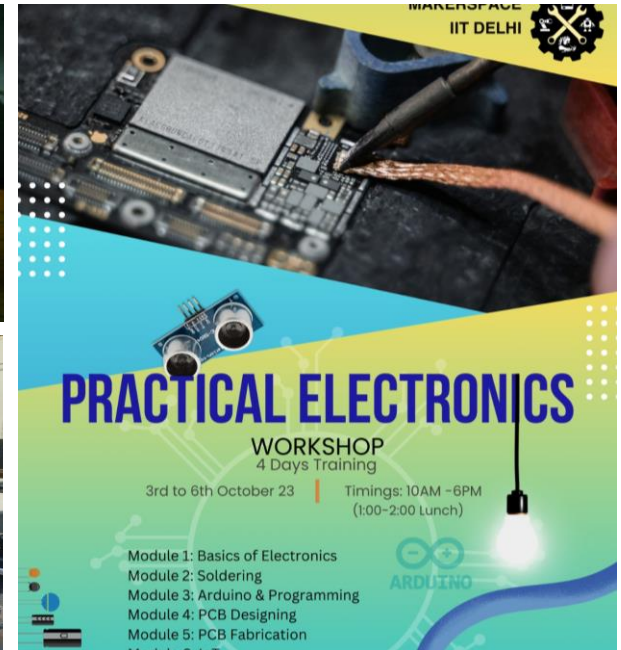
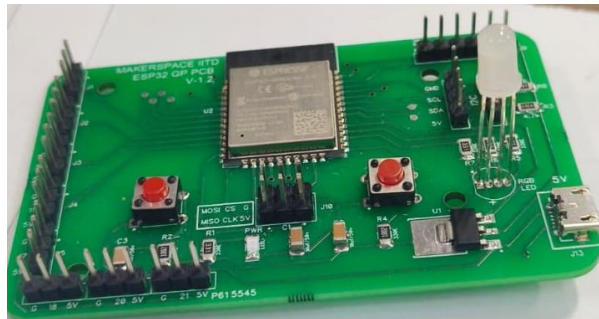
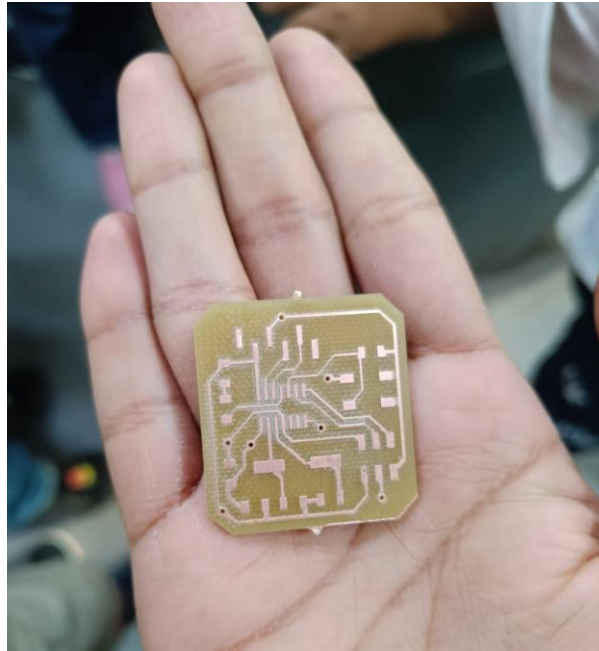
Low cost sensors for PM2.5 monitoring

Everyone should learn this!

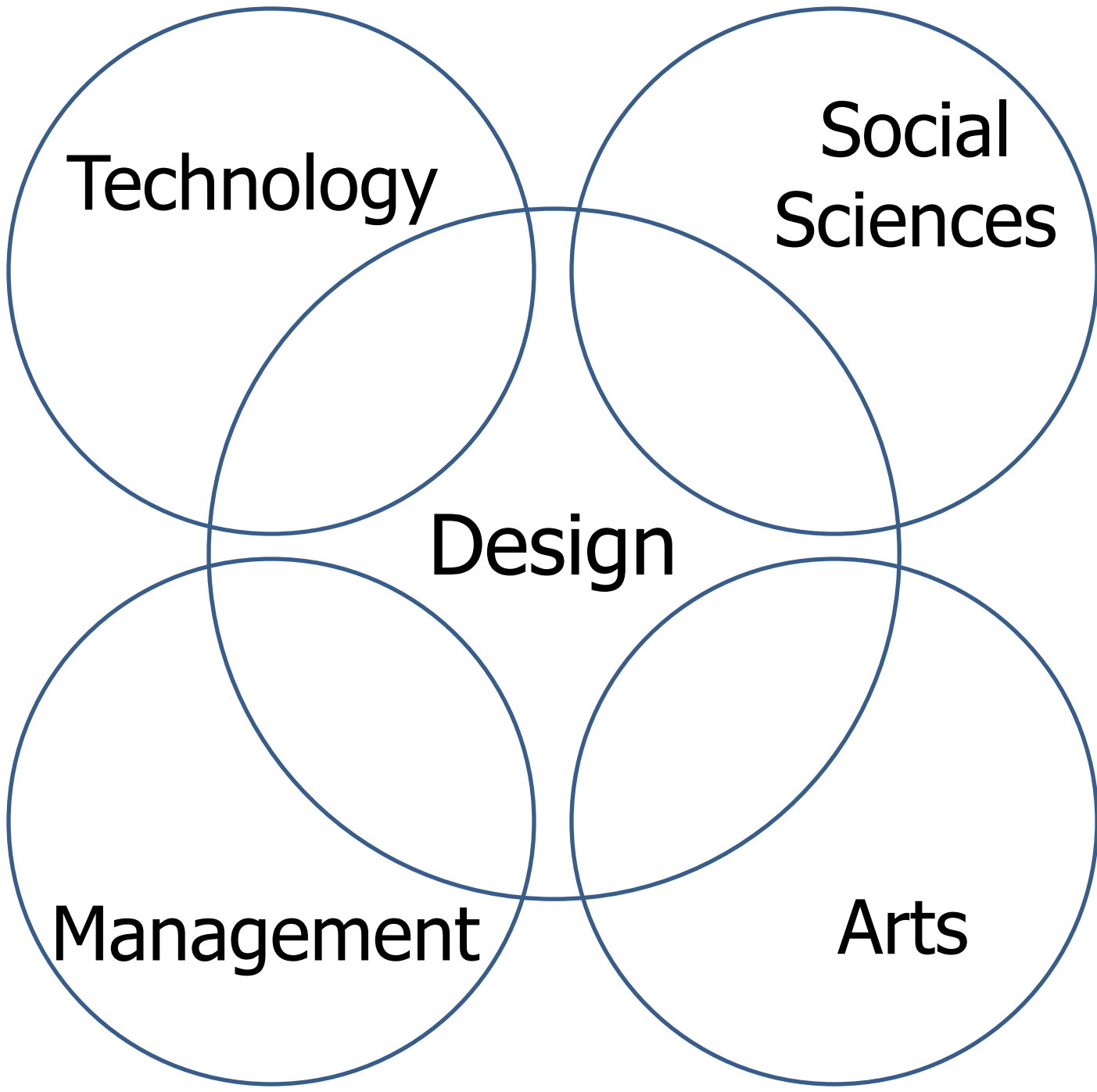


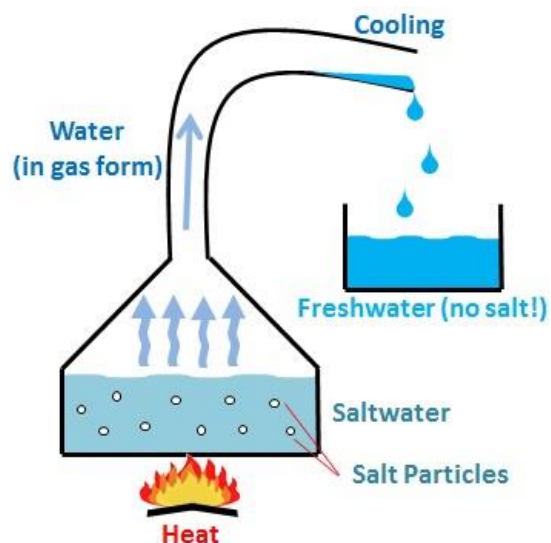
<https://github.com/vyomaniitd/PM2.5---PMS7003>

Invited talk at CERCA, IIT Delhi: [A breath of fresh air](#)



Extreme Making





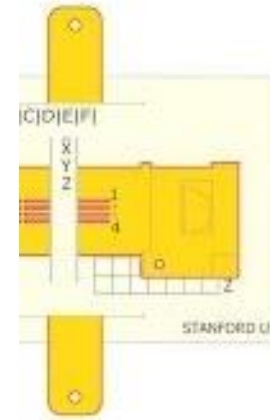
Water filter – plant xylem



Waste-water treatment

Biology, Chemical engineering, Mechanical engineering, Nano-technology, Social science

Examples of One Science: SOLVE water



Science for impact

