

Cubesat Class

Fabrication

Grace Copplestone

Workshop help from Tom, Harith & Devora

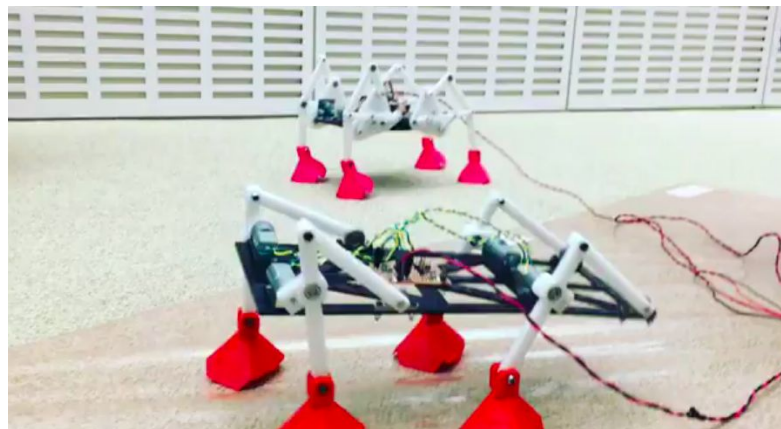
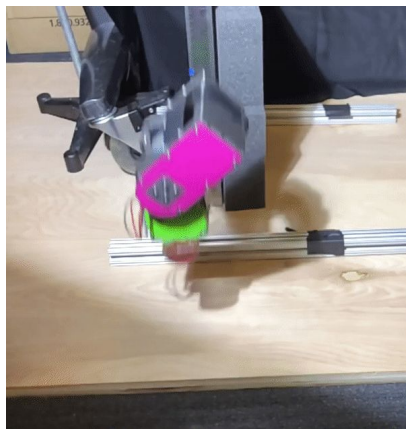
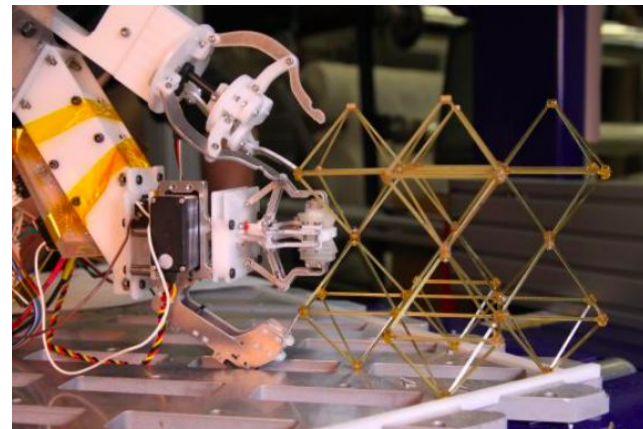
Schedule

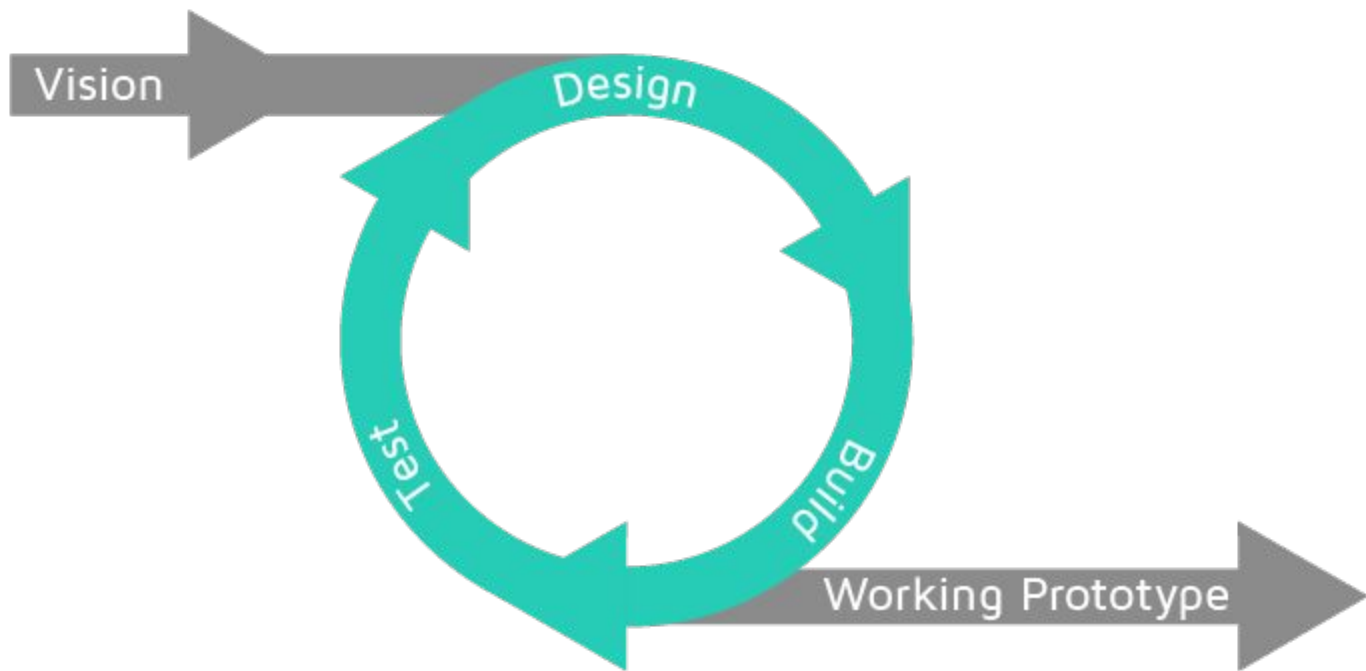
30 mins - Intro to fabrication

45 mins - Workshop tour + prototype cubesat chassis

45 mins - Review pros and cons of fabrication techniques

About me





Materials

Types

- Metals
- Polymers
- Composites

Properties

- Density
- Strength
- Thermal conductivity
- Thermal expansion
- Cost
- UV degradation

Processes

Subtractive process

Additive process

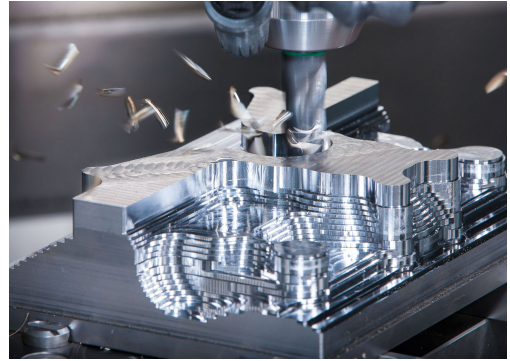
Processes

Subtractive process

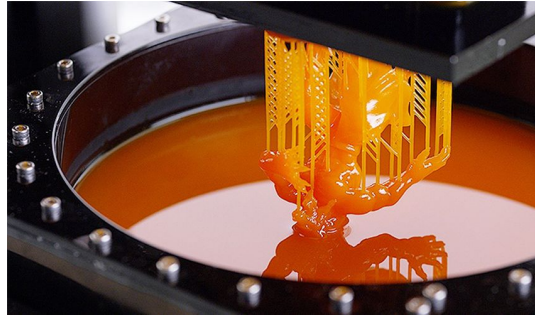
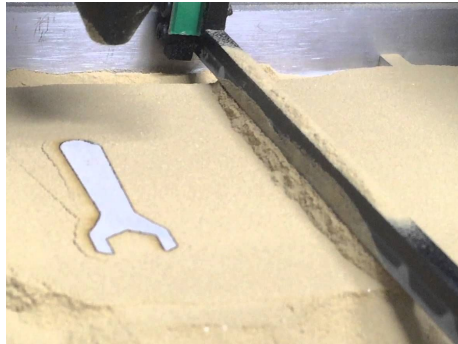
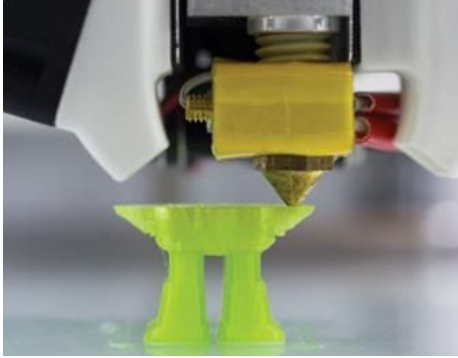
CNC machining

Waterjet cutting

Laser cutting



Processes



Additive process

Fusion deposition modelling
(FDM)

Stereolithography (SLA)

Selective laser sintering
(SLS)

Assembly and connections



Assembly and connections



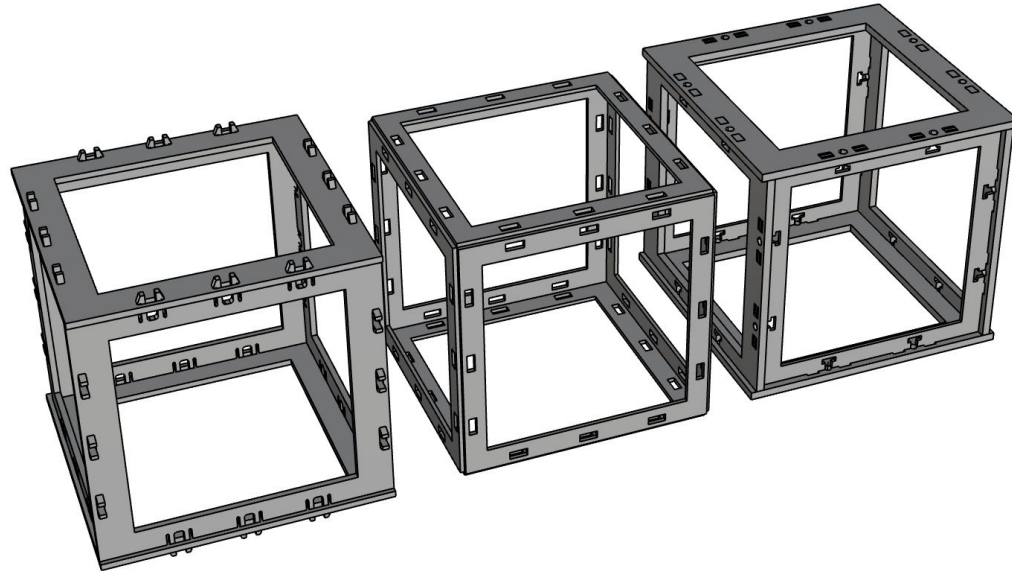
Testing

- Qualitative
- Strength testing
- Vibration testing
- Thermal testing
- Electromagnetic radiation testing



Workshop prototyping

Group 1 - Harith	Group 2 - Tom	Group 3 - Grace
Laser cutting	Waterjet cutting	CNC machining

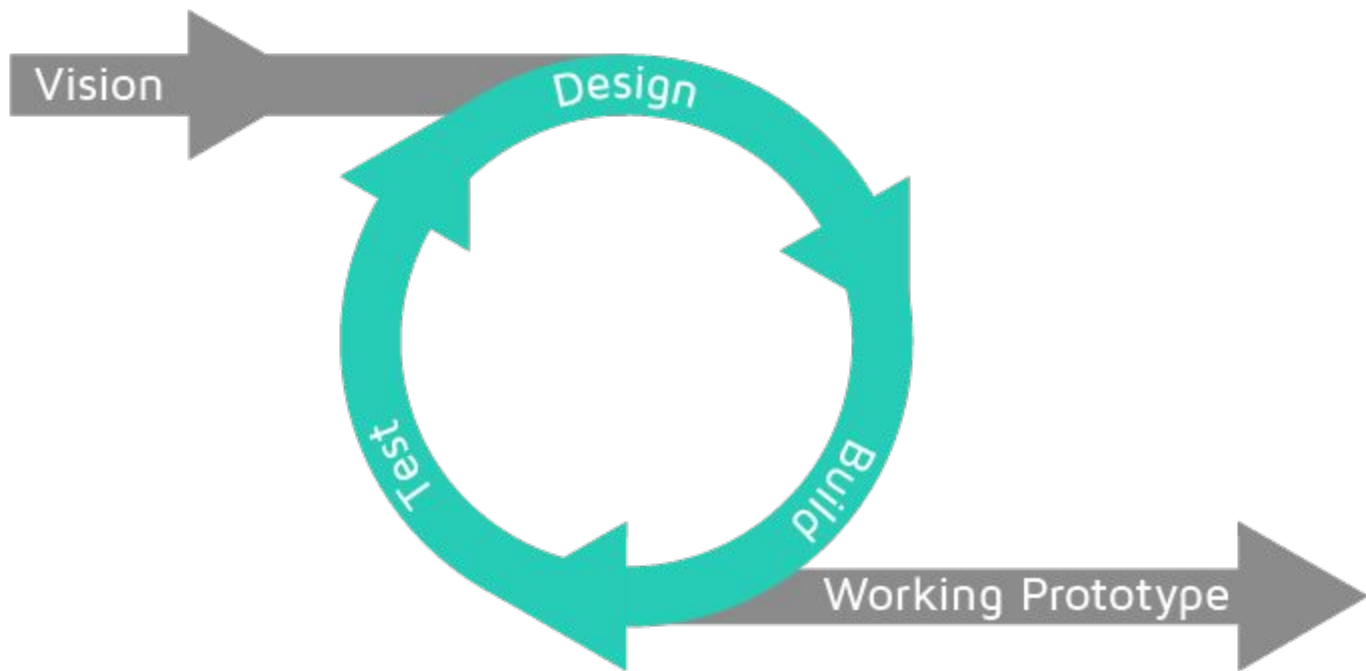


Task

- Take photos
- Answer the questions

Evaluation

1. Time to fabricate
2. Ease of assembly
3. Accuracy
4. Withstand launch conditions
5. Withstand space conditions
6. Recyclability



Cool fabrication processes

<https://twitter.com/elonmusk/status/807354766804168706?lang=en>

<https://www.nasa.gov/exploration/systems/sls/core-stage-production-continues-for-rockets-first-flight>



Next steps

- Engineering Design Workshop
 - Thursday, July 5th through Friday, August 3rd
 - **Applications close May 7th.**
 - <https://edgerton.mit.edu/k-12/EDW>