Capstone Design Project: 
**Carleton University Crash Dummy**
*(CUCD)*
- CUCD capstone design project aims to **design & build a crash dummy** to measure injuries sustained by a cyclist involved in a collision with a vehicle.

- This dummy can simulate **different bicycle-vehicle collision scenarios** and **human responses** using various measured metrics that occur during a collision such as:
  - Impacts
  - Accelerations
  - Deflections
  - Forces
  - Movements
FOOTAGE FROM 2017 – 2018
DRONE FOOTAGE FROM 2018 – 2019
• In the 2020 – 2021 design year, the crash dummy was developed further to be fully 3D printed.

• This design discontinued the use of any metal screws, fasteners, or fittings.
This year the objectives included:

- Functional Crash Test Dummy:
  - Anthropometric (size, inertia) for a 50th 19 years old male
  - Breakable parts
  - Integrated sensors
  - Integrated brain
  - 3D printed

- Simulate bike-car collision and collect collision data:
  - Track-less launch mechanism
  - Power, control, steering, brakes
  - Timing / trigger
  - Bike stabilization
Future objectives include:

- Further development of 3D printed dummy:
  - Artificial internal organs and sensors

- Further development of launch cart control systems

- Development of a new dummy which could represent a female or adolescent / child cyclist
- Crash Dummy with two interchangeable configurations:
  - Dummy with breakable parts (head, brain, neck, arms, and legs)
  - Dummy with durable parts and integrated sensors

- Reliable Launch System:
  - Bike support, balance, and release
  - Smooth launch
  - Unsupported travel after launch
Autodesk’s Fusion 360 is the only CAD software used in the CUCD capstone.

Fusion 360 is a cloud-based 3D modeling, CAD, CAM, CAE, and PCB software platform for product design and manufacturing.

Designs from previous years are archived and available for use by CUCD students.

The advantage to this is that collaboration between students is seamless.
Thank You

Questions?

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