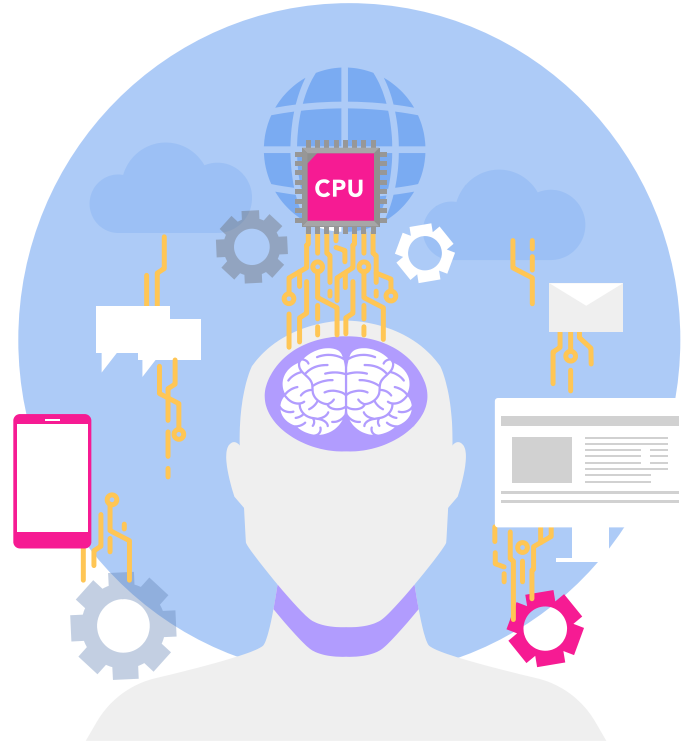


Capstone Proposal

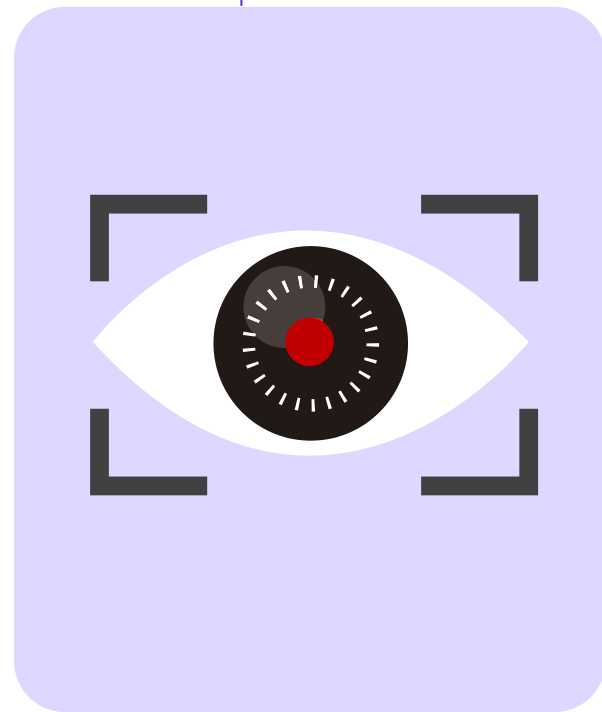
(Project Name TBD)

Brydon Herauf & David Kim

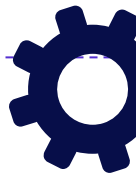


The Big Idea

We propose a **computer vision-based** system that detects slips, falls, and prolonged inactivity in homes. Tailored for the **elderly** and **disabled**, it enhances **safety** by detecting incidents that might otherwise go unnoticed and ensuring timely intervention.



Why This Matters.



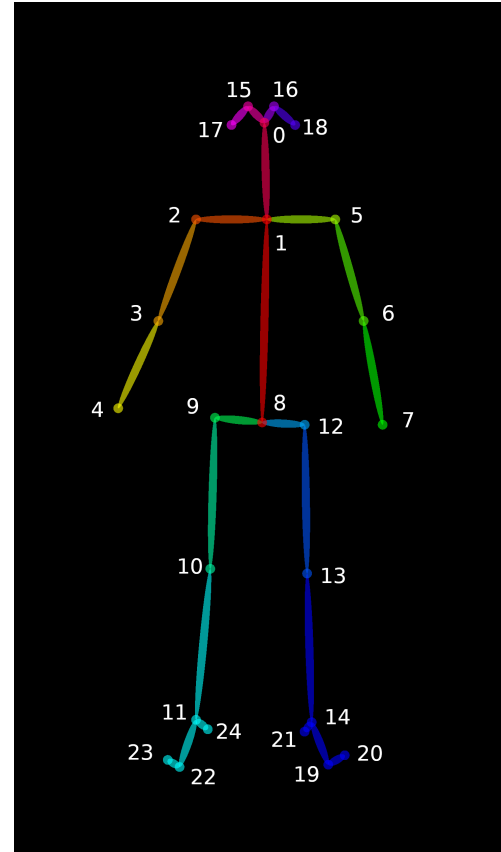
- “In Canada, falls are the **leading** cause of injury-related **hospitalizations** and injury **deaths** among people aged 65 or older”
- “Approximately 52% of falls resulting in hospitalization occurred in a **household** residence”
- Unfortunately, many falls and related incidents go unnoticed or unaddressed for extended periods. That’s where we come in!

Source: Surveillance report on falls among older adults in Canada – Public Health Agency of Canada, 2020. ([Link](#))



Our Solution

- Use state-of-the-art **computer vision** technology to process video in **real-time** and **detect** incidents.
- Fire off texts, emails, and/or phone calls to emergency contacts.
- Allow users to **configure** contacts, enable/disable parts of our model, and potentially more, through an application.



What Makes Us Different?



Limitations: Relies on user remembering to wear the device and being able to access it after the incident.



Limitations: Tailored towards facilities, making it less practical for individuals living alone.



Limitations: Cannot detect anything other than falls, and does not allow for user customization.



Brydon Herauf

- Interested in Computer Vision
- ENSE 412, ENSE 411
- Developed a handwriting recognition model.

David Kim

- Interested in Machine Learning and Web Dev
- ENSE 405, ENSE 496AI
- Developed a user-centric web application that provides a digital eye exercise platform.

Target Dates

1

October 31

Documentation mostly complete.

CV Approaches Explored.

2

December 5

Documentation finalized.
Working MVP.

3

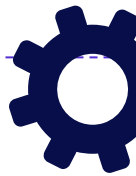
February 15

Development mostly complete.

Begin polishing and working on presentation.



Potential Challenges



Training

- What data will we train the model on?
- Will we be able to achieve high accuracy?

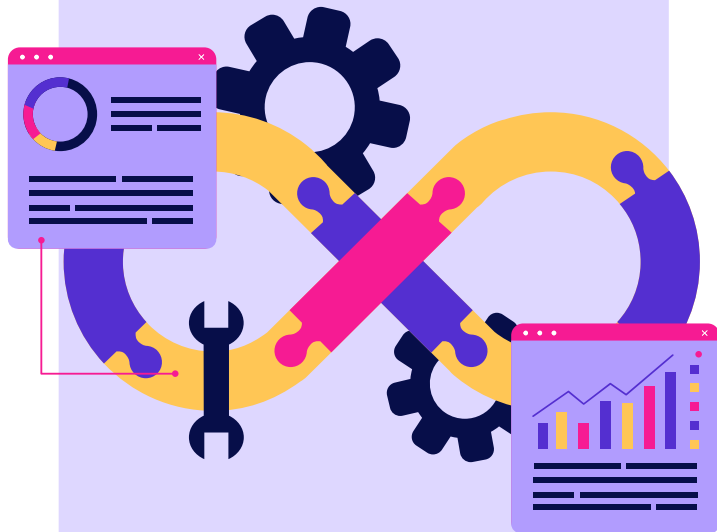
Real-Time Processing

- Will our model be light-weight enough to process video in real-time (or close to it)?

Ethical Considerations

- Will our model be able to run on a local device? If not, is that a privacy concern?
- What about false positives? False negatives?





THANKS!

Resources:

- <https://www.canada.ca/en/public-health/services/publications/healthy-living/surveillance-report-falls-older-adults-canada.html>
- <https://www.lifecall.com/>
- <https://www.smartpeep.ai/>
- <https://kamivision.com/kamicare/>
- <https://stackoverflow.com/questions/59288435/opencv-extract-only-the-skeleton>

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