TASKS

List of Available Tasks (Please remove when you have chosen a task):

- Design Specification (Incomplete) (I think it looks good now)
- <u>PowerPoint Presentation</u>

Chris
- ~~Team Formation~~
- ~~Tasks Breakdown~~
- ~~Project Planning & Schedule~~

Guanfeng
- Budget estimation
- Team Formation

Samson
- ~~Team Formation~~ (Filled out my section)
- ~~Communication Plan~~ (Done, ready for review)
- ~~Tools required~~ (Done, ready for review)

Shahin
- Test Plan
- ~~Review of Existing Solutions~~
- ~~Team Formation~~

Tien
- Team Formation
- Contingency Plan
- Alternatives

Victor
- Team Formation

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Due dates:

Report → October 5th 2024 @ 11:59 PM

Power point presentation → October 7th 2024 @ I'm not exactly sure lol

Monday October 7, 2024		
Time	**Project Title**	**Group#**
9:30 am-10:00 am	Shop&Go	#23
10:00 am-10:30 am	"VISION": Visual Impairment Support and Intelligent Obstacle Navigation	#24
10:30 am-11:00 am	Sports Vision Pro	#13
11:00 am 11:30 am	Charitable Mobile App Development	#7
11:30 am 12:00 pm	Bioinformatics software Development for DNA Toehold Design Project	#19

Its at 10h30 lol xD

Joshua's Feedback

- Difficult to stream on raspberry pi

- Dedicated wireless module

- ESP32 not enough ram

- Ready to send clear to send protocol

- Going to be difficult to have less than 1 sec video delay due to time it would take for

  video to be sent to user

- Ram not an issue

- Compressing video

- Using cloud server would be necessary

- All the smaller modules that use little data can transmit via wifi

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RESOURCES & BONUS IDEAS

Beacon Triangulation Methods:

- Signal Triangulation using a transponder

    [How Real-Time Location Systems Work - Ubisense](#)

- **Consider using <u>inertial navigation</u> w/ a transponder and accelerometer with a gyroscope:**

    - https://forums.raspberrypi.com/viewtopic.php?t=217142#p1335457

- **<u>OpenCV</u> with the help of Ai (requires more cameras & no way of mapping players):**

    - https://forums.raspberrypi.com/viewtopic.php?t=217142#p1335404:~:text=Well%2C%20GPS%20itself,very%20ballparkish%20IMO.

- **DWM1000 Ultra Wide Band for Transponder (Beacon):**

    - **https://eliko.tech/uwb-technology/**

    - **https://www.pozyx.io/pozyx-academy/how-does-ultra-wideband-work**

    - **https://www.youtube.com/watch?v=zA27p0Pj30U**

iRLED Tracking Methods:

- https://developers.meta.com/horizon/blog/increasing-fidelity-with-constellation-tracked-controllers/

Heart Rate Sensor Methods:

- https://www.dcrainmaker.com/2014/05/lifebeam-helmet-integrated.html

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Bonus Idea:

- INCORPORATE DATA COLLECTION, **DATA = MONEY!!!!!** 😆

- Play with the frequency range of the light intensity to distinguish between different

    players?

📄 Capstone Project Topic

REPORTS and PRESENTATIONS

Submission deadlines must be respected

Penalty for late submission:
10% of the full grade per day for each of the late reports.

Rules specified in the guideline must be followed
  · length limit,
  · style/form, etc.

Standards, if applicable, must be applied and followed:
· information source referencing,
· technical drawing (schematics, block diagrams, flow-charts, etc.),
· illustrations, etc.

Abstract

Every report must have an abstract:

• **Summary of the contents of your report.**

• **For a wide range of readers.**

• **Concise and specific.**

Phase 1 Report (10-20 pages)

• Project definition and description (objectives, functions, requirements, specifications, clients).
• Technical contents of the system (structure, blocks, devices, ...)
• Simulation and test plan.
• Work schedule/milestone, task assignment.
• Budget.
• Resource requirement.
• Communication plan.
• Contingency plan.
• ...
• References.

Reports

· The "Guidelines…" = the best "How-to-write-an-engineering- report" guide.
· Schematics: IEEE 315 or IEC 60617 standard.
· Flow charts, block diagrams: use appropriate shapes and symbols.
· Use figures instead of words.
· Analyse alternatives.
· Define and analyse trade-offs.
· Justify your choice.
· Clearly list the deliverables for each stage.
· Compare what was planned to what was actually achieved. Analyse discrepancies (Phases 2 and 4).
· Do not omit the project and team management part.
· **See the Manual for more details.**
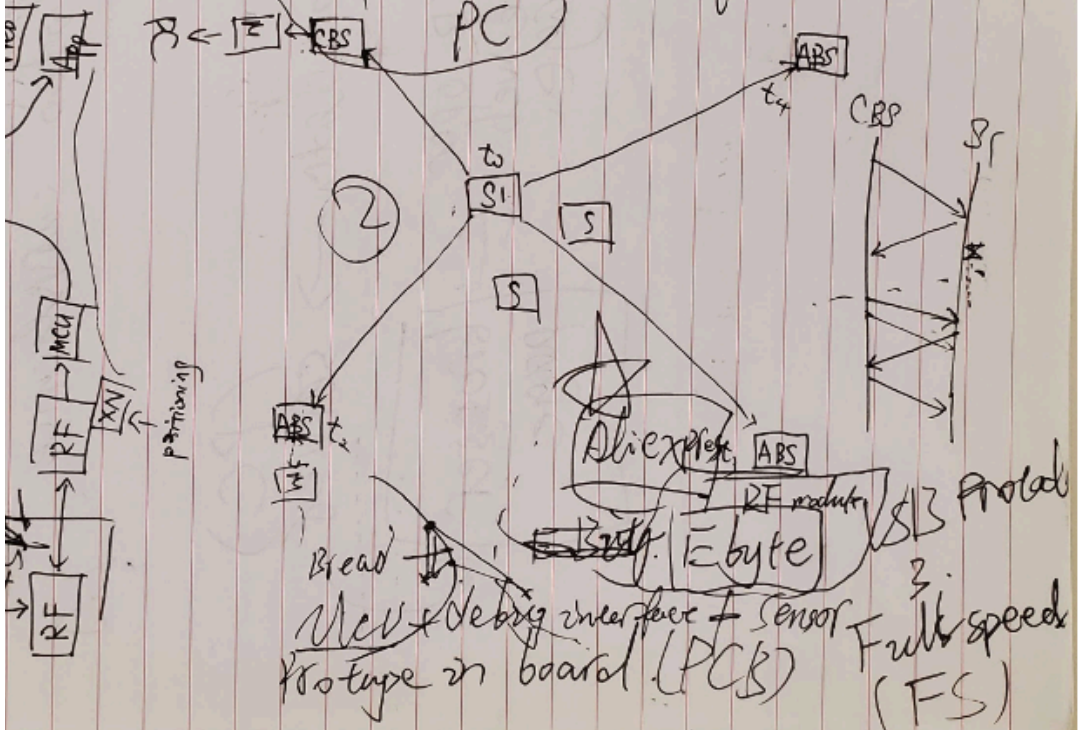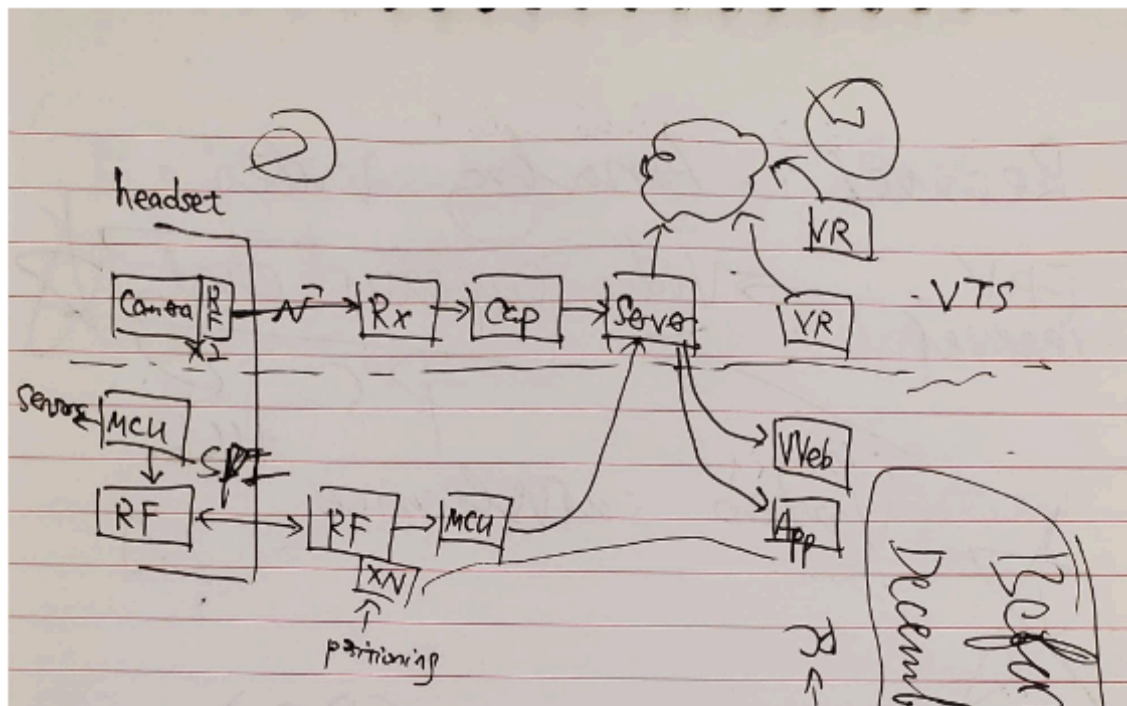
LIST OF COMPONENTS

Official List of Components

https://liveconcordia-my.sharepoint.com/:x:/g/personal/s_khalk_live_concordia_ca/EaYs X6bXTwpGucHZqfsCVnIB_C0IHsL1LRu2DqDQDji1Jg?e=iBNPvc
List of emails that I shared the excel doc with:

Email:
samson.kaller@gmail.com
Shahin.khalkhali@live.concordia.ca
guanfeng.canada@gmail.com
vuminhtien2110@gmail.com
victorwanghy@gmail.com
ro_gan@live.concordia.ca

- DSP Microcontroller

  - ~~Realtek AMB82-Mini IoT AI Camera Board (USD 25$)~~
  - ~~ESP32 Microcontroller (CAD 13$)~~
  - ~~Raspberry Pi Compute Module 4 (CM4) (CAD ~200$ with all accessories)~~
  - ~~Raspberry Pi 5/2GB (CAD 70$)~~
  - Raspberry Pi 4 Model B (CAD 80$) * Currently have one

- 3D Camera & Infrared Camera

  - Global Shutter 3D Stereo VR Camera Module (CAD 120$) * Currently have one
  - ~~ELP 720p HD USB Camera Module with Microphone (USD 55$)~~
  - Raspberry Pi Wide Angle NoIR Camera (CAD 27$) *

- Infrared LED

  - L1I0-0850150200000 (CAD 6$)*
  - SFH 4715AS (CAD 5$)
- Microphone
  - 2020 Upgrade 2.4G Wireless Microphone (CAD 40$) → Not compatible w/ RPI4?
  - 1063 Electret Microphone Amplifier (CAD 13$) *
- Accelerometer
  - ~~ASL2002 (CAD 7$)~~
  - BNO055 (CAD 23$) *

- electroencephalography

  - [NeuroSky MindWave Mobile 2 EEG Sensor Starter Kit](#) (CAD 180$)

- Galvanic Skin Response (measures emotional/stress levels through skin conductance)
  - [SEEED STUDIO 101020052](#) (CAD 13$)

- Heart rate sensor ([Idea on how we can do it](#))
  - ~~[Pulse, Heart Rate Sensor for Arduino](#) (USD 38$)~~
  - ~~[SI1144-AAGX-GMR](#) (CAD 15$)~~
  - [MAX30100](#) (CAD 22$) *

- Battery

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- GPS or Triangulation HW (RF) → * **<u>MIGHT CONSIDER USING iRLED METHOD</u>***

  - [SX1280 Module (RF)](#) *   →   Buy on aliexpress? Buy the one that does not have the MCU, we will handle protocol (ALSO THIS IS BEST ANTENNA FOR TRIANGULATION FOR OUR PROJECT)
  - [ESP8266-01 Module (WiFi)](#) (CAD 7$)
  - [VK2828U7G5LF TTL Ublox GPS module](#) (CAD 26$)

- Transponder (Beacon) → * MIGHT CONSIDER USING iRLED METHOD INSTEAD*
  - [DWM1000](#) (CAD 36$) *