

People Counting Infrastructure



Champ Foronda Team Lead



Seth Burchfield Developer



Brandon ThomasDeveloper



Joshua Holguin Developer



Brigham Ray Developer



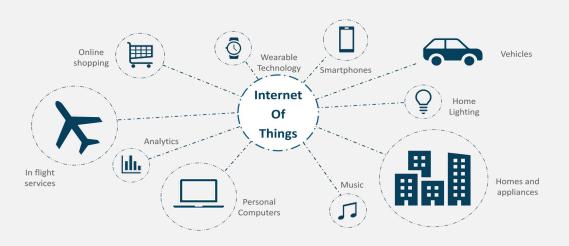
Volodymyr Saruta Team Mentor



Duane BooherClient

Internet of Things





- Connectivity
- Cloud infrastructure
- Big data



OUR CLIENT



- Duane Booher
- NAU ITS IoT Team
- Smart and SecureCampus



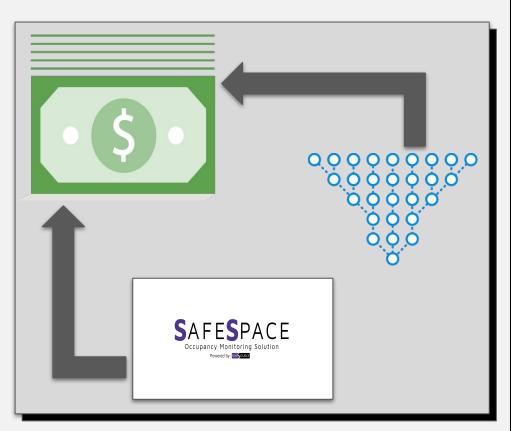
The Issues



PRICE

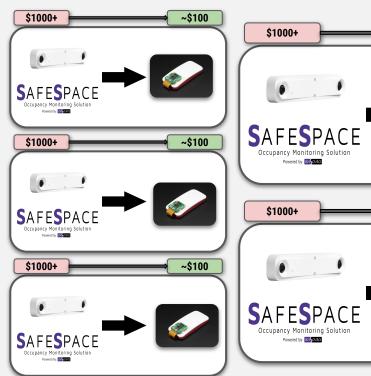
SCALABILITY

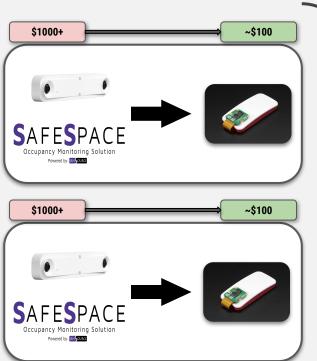
FLEXIBILITY





Solution Overview

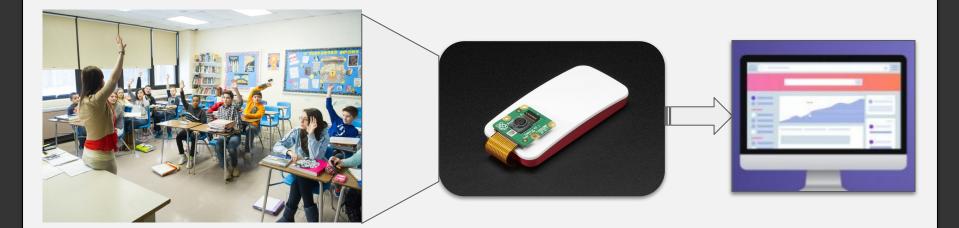






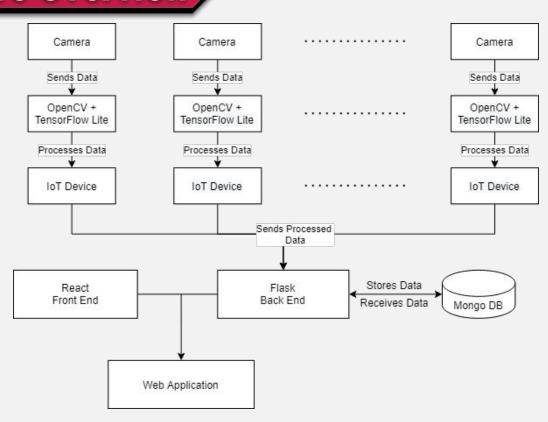








Architecture Overview





Challenges and Resolutions

Challenges

- Find the best model algorithm for use case
- 2. Reduction of image processing time
- 3. Setup and connection issues

Resolutions

- YOLO model provided best performance
- 2. Load model to memory on Pi startup
- 3. Save image to memory instead of disk
- 4. Containerize the application

Schedule



Team PiWatcher - Schedule

Current: Week 7																				
Deliverable	Start Date	End Date	Duration	Percent Complete	Week 1 (1/11)	Week 2 (1/18)	Week 3 (1/25)	Week 4 (2/1)	Week 5 (2/8)	Week 6 (2/15)	Week 7 (2/22)	Week 8 (3/1)	Week 9 (3/8)	Week 10 (3/15)	Week 11 (3/22)	Week 12 (3/29)	Week 13 (4/5)	Week 14 (4/12)	Week 15 (4/19)	Week 16 (4/26)
Milestone I: People Recognition & Counting People	1/11/2021	2/5/2021	4	100%		Milest People Red Counting	ognition &													
Software Design Document	1/11/2021	2/12/2021	5	100%		Software	Design Do	cument												
Milestone II: Cont. Counting People & Connecting Infrastructure (MVP)	2/8/2021	3/5/2021	4	80%					Milestone II: Cont. Counting People & Connecting Infrastructure (MVP											
Design Review II	2/15/2021	2/26/2021	2	95%						Design	Review II									
Full Prototype Tech Demo Milestone Spec.	3/1/2021	3/12/2021	2	0%									type Tech lilestone							
Milestone III: Bugfixing & Optimization	3/8/2021	4/2/2021	4	0%							*		В	Milesto ugfixing & (n				
Software Testing Plan	3/8/2021	4/2/2021	4	0%								Software Testing Plan								
Design Review III	3/22/2021	4/2/2021	2	0%											Design F	teview III				
Completed Team Website	4/5/2021	4/16/2021	2	0%													Complet Web	ted Team osite		
Capstone Presentation	4/5/2021	4/26/2021	3	0%													Capst	one Preser	ntation	
Milestone IV: Software Testing and Product Finalization	4/5/2021	4/23/2021	4	0%									Milestone IV: Software Testing & Product Finalization							
Final Product Acceptance Demos	4/19/2021	4/30/2021	2	0%																Product ice Demos
Final Project Delivery	5/3/2021	5/7/2021	2	0%																Final Project Delivery





PROBLEM

Expensive and unscalable
commercial product for counting
people to measure the use of
areas of campus

SOLUTION

Cheap and scalable solution catered towards the needs for NAU