

Team Copy Waste

Vlog 3

Oct. 9, 2021 - Dec. 3, 2021

 IN PARTNERSHIP WITH
PRAIRIE ROBOTICS



THE TEAM



Nolan Flegel
Machine Learning



Rishabh Prasad
Front-End Services



William Peers
Back-End Services

PROJECT VISION

REDUCE RISK FOR
WASTE MANAGEMENT
WORKERS & COST FOR
MUNICIPALITIES



PROJECT MISSION

TO *AUTOMATE* THE
DETECTION OF
SEVERE & RARE
CONTAMINANTS IN
RECYCLING



Business Needs



Saskatchewan

Firefighters knock down recycle depot fire in Regina's west end



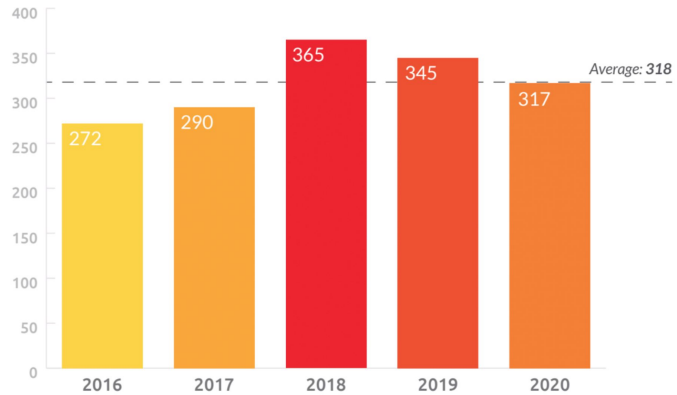
<https://www.cbc.ca/news/canada/saskatchewan/crews-fighting-fire-at-crown-shred-and-recycling-1.5980051>

<https://www.cbc.ca/news/canada/saskatchewan/emterra-recycle-depot-fire-1.6202918>

Business Needs



WASTE & RECYCLING FACILITY FIRES US & CANADA 2016-2020 VS. AVERAGE



Source: Ryan Fogelman, rfogelman@firerover.com



Figure 10: Photo of the aftermath of an LIB fire in a garbage truck. An LIB fire in a garbage truck forced the driver to empty garbage onto the street to be extinguished, disrupting service for customers and creating a traffic hazard for community members and first responders. Photo courtesy of Bellevue Police Department.

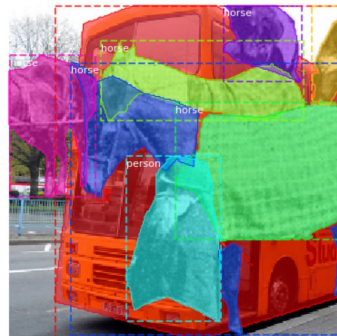
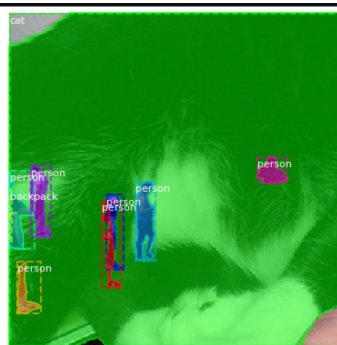
Business Needs

- Reduce Risk of Fires and Associated Health Concerns
- Reduce Cost
- Address Careless Recycling & Hazardous Contamination

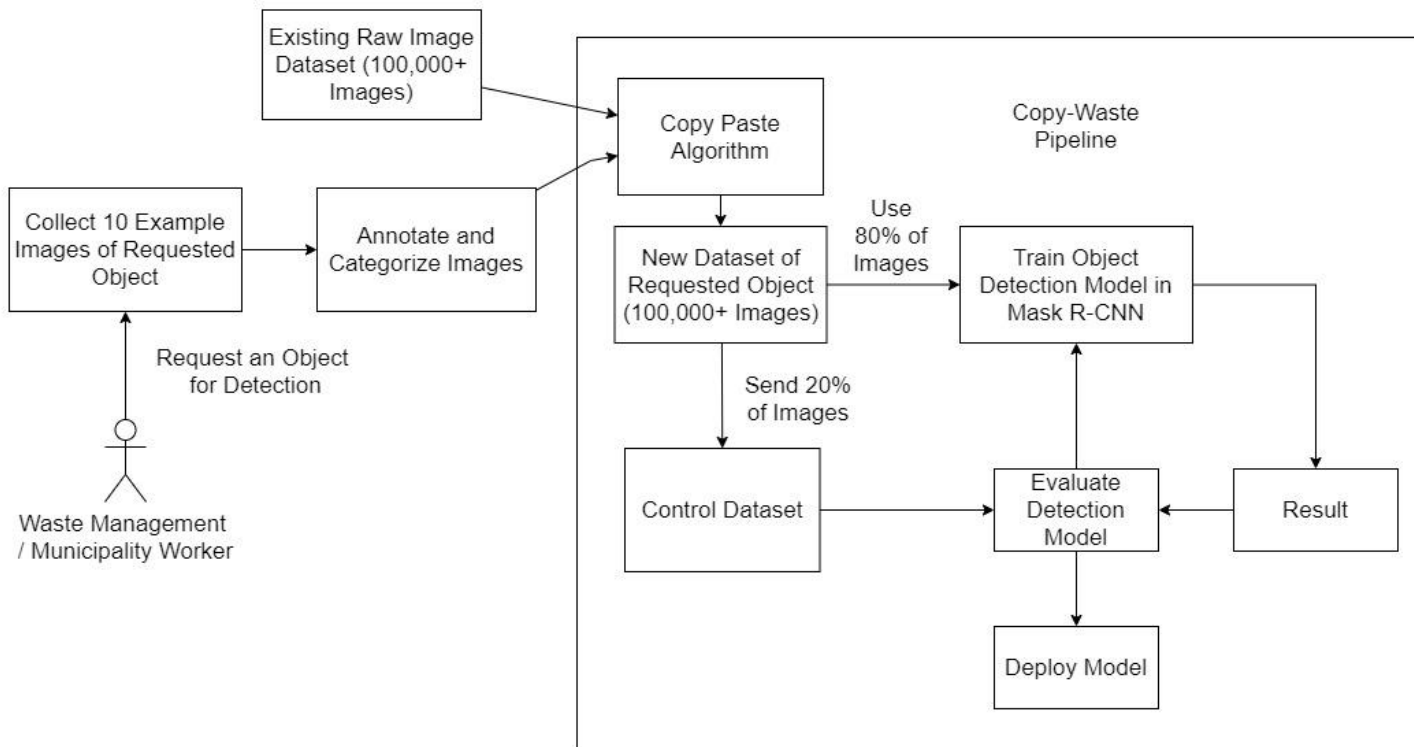
Opportunity and Innovation

- Detect Rare Contamination
- Reduce Time and Resources required
- Automated Pipeline

Simple Copy-Paste



Simple Copy-Paste



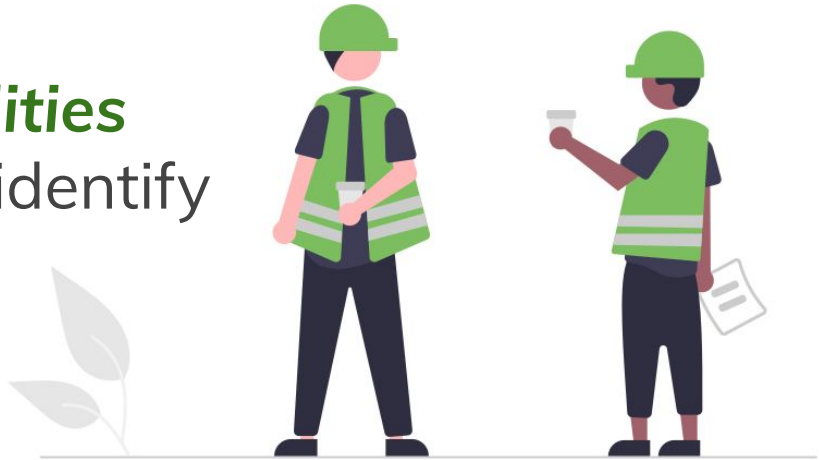
Partnership

Prairie Robotics will serve as
our industry partner



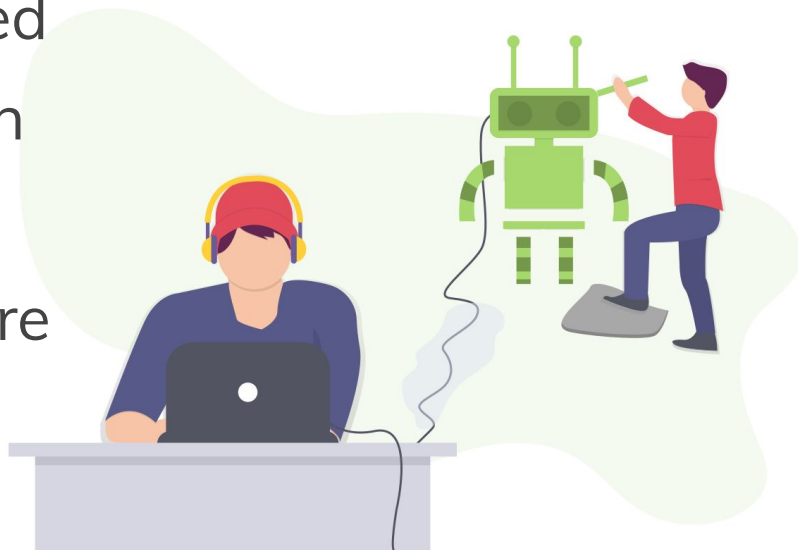
Our Customer

Waste Management
companies & **Municipalities**
who are attempting to identify
hazardous waste



Current State

- Mitacs Application Submitted
- Phase 1 Nearing Completion
 - Bin Detector Model
 - Green Screen Architecture



Individual Contributions



- Collecting false positive image datasets
- Annotated false positive images using SuperAnnotate
- Scripts for converting SuperAnnotate to Yolo
- Train/test detection model in Yolov5

Individual Contributions



- Green Screen - Architecture, Maps, Integrations
- Green Screen - Status Documentation
- Streamsight API Integrations

Individual Contributions



- Collected false positive dataset
- Created image annotations
- Categorized/split dataset for test/train
- Created a YOLO detection model

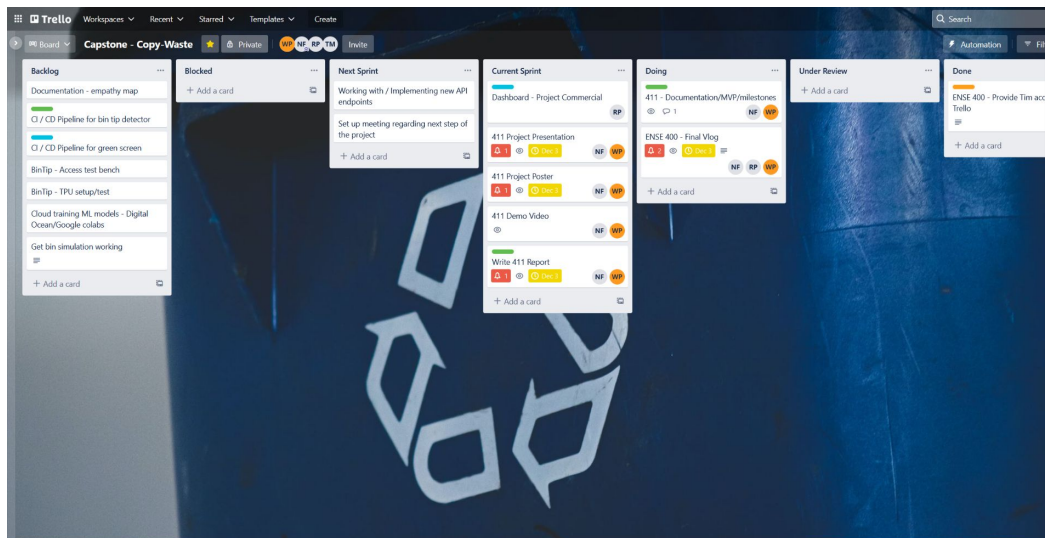
STATUS
GREEN

Project Issues / Changes

- Bin Detector awaiting Deployment
- API Integration Issues



Knowledge Management Overview



Team Meeting

Nov 16, 2021 / 2:00 PM / Zoom

Attendees

Nolan Fiegel, Rishabh Prasad, William Peers, Sam Dietrich

Agenda

- Bin Tip Status
- Dashboard Status
- Roadmap for ENSE405/411 final project submissions

Notes

- Mitacs - Review with Dr. El-Dariby, updated our CVs
- Dashboard updated, working with real data, working with Avery to fix issue
- BinTip - annotations completed, working on converting superannotate to Yolo format
- BinTip - Simulation -> work with Sam later this week if models are trained
- FrontEnd - Basic calculations and data display
- Busy next 2 weeks with other classes, focused on finishing all projects

Action Items

1. Follow up with Dr. El-Dariby about Mitacs
2. Finish SA to Yolo Script
3. FrontEnd - get map legend working
4. Scrum with Tim on Friday

Next Meeting Agenda (Nov 23, 2:00pm)

1. Address issues with API
2. Look into Edge compute simulation
3. Mitac Status

Green Screen Overview

GREEN SCREEN

Green Screen Dashboard

Username *

DemoAdmin

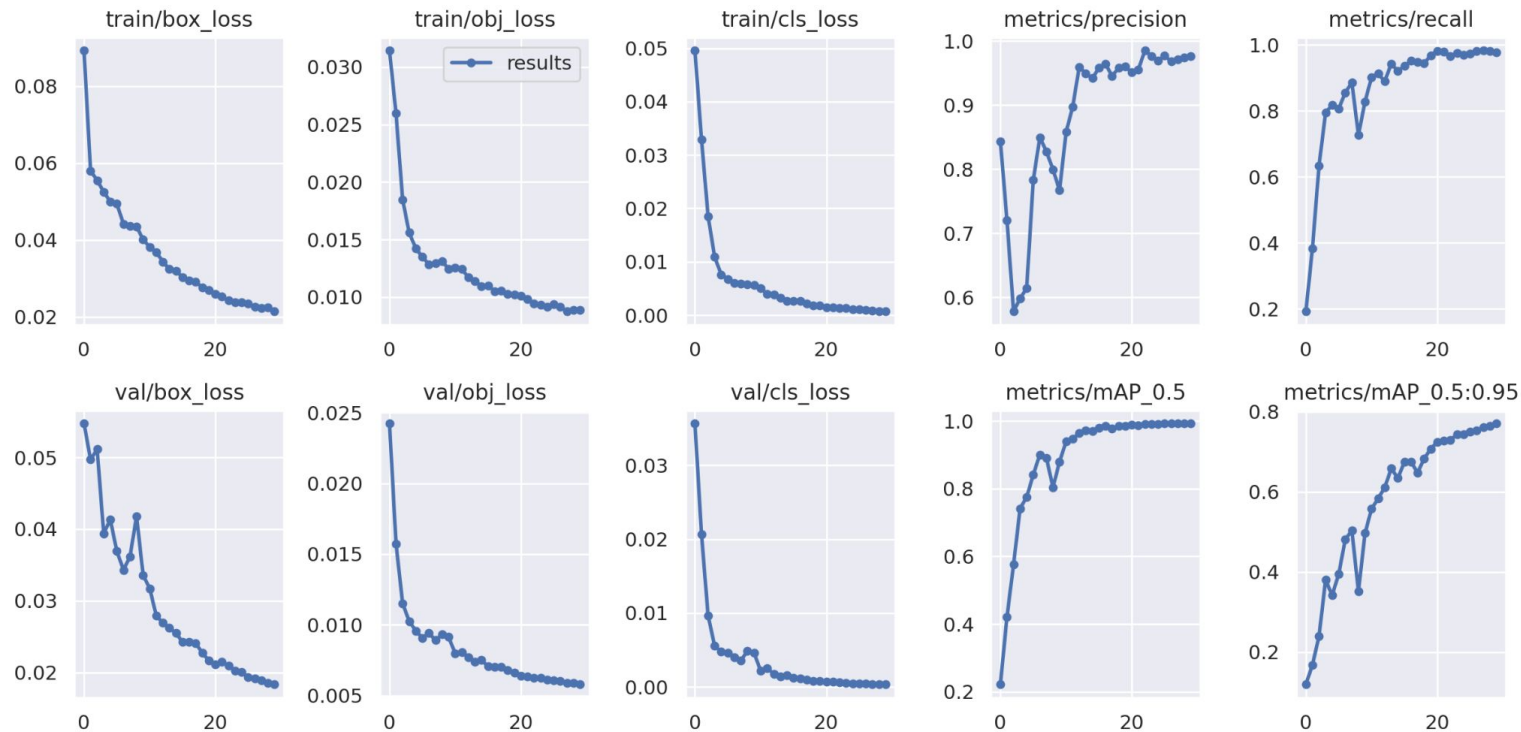
Password *

SIGN IN

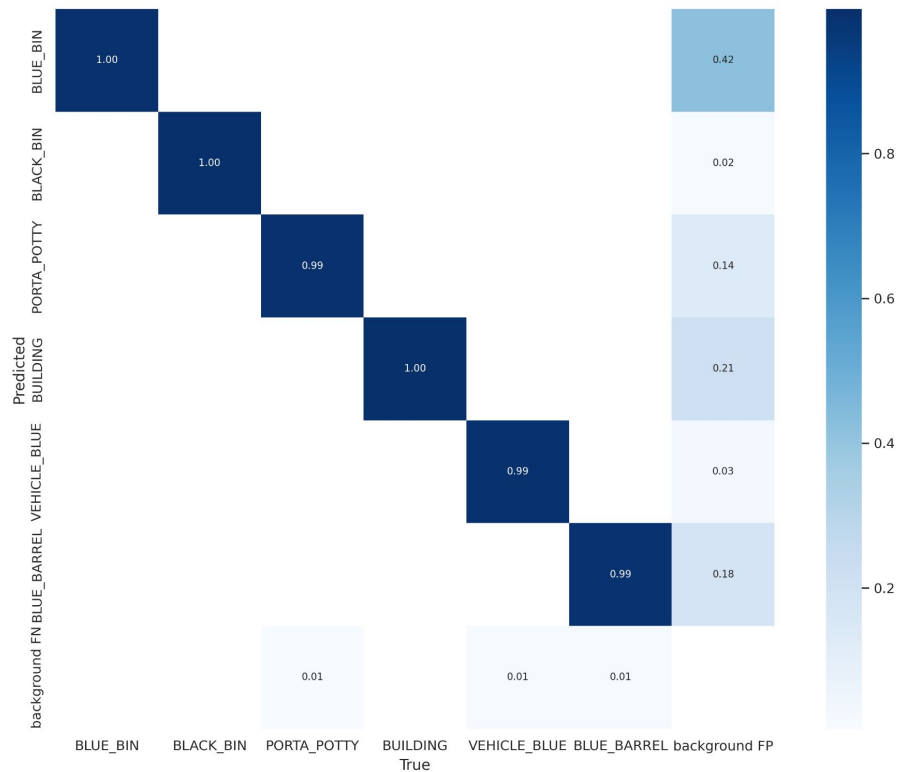
Bin Tip Overview



Bin Tip Overview

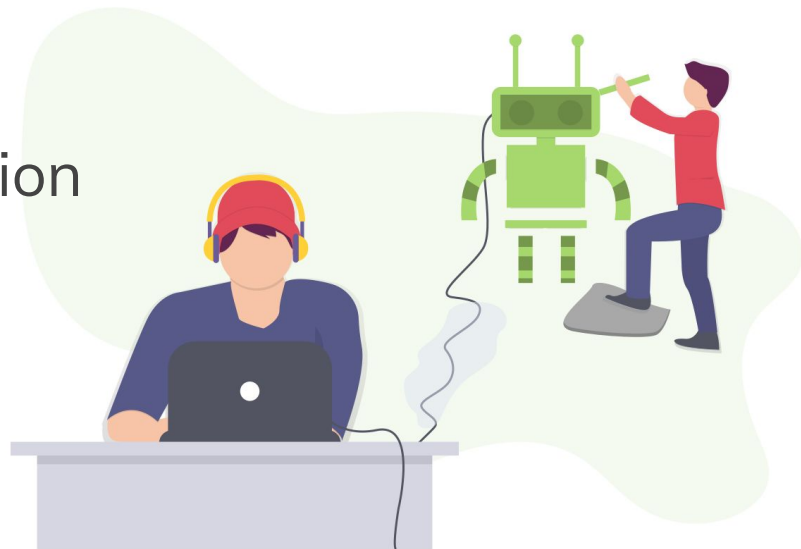


Bin Tip Overview



Next Up

- Meetings
- Copy-Paste Implementation Planning
- Bin detector deployment



Retrospective

→ What went well?

- Planning, communication, and regularly scheduling dedicated project time

→ What could be improved?

- Creating a standard for building epics containing user stories and tasks for improved project management

→ What will the team continue or change in ENSE 477?

- Continue consistent communication & developments
- More dedicated time to collaborate on the capstone

Reflection

- Does the team feel "on track"?
 - We believe we are still on track
- What progress does the team particularly feel good (great) about?
 - Our Research and Mitacs Submission
 - Completing the bin detector
 - Front-end

Reflection

- What barriers (if any) does the team feel are a current impediment to success?
Deploying the bin detector
- What help (if any) does the team require to move positively forward?
Meetings with PR about initial steps for the copy paste pipeline

Reflection

→ What questions or concerns does the team have (if any)?

No concerns at this time

References

- <https://leaderpost.com/news/local-news/smouldering-load-and-spray-cans-led-to-fire-at-crown-shred-says-regina-fire-department>
- <https://www.cbc.ca/news/canada/saskatchewan/crews-fighting-fire-at-crown-shred-and-recycling-1.5980051>
- https://www.epa.gov/system/files/documents/2021-08/lithium-ion-battery-report-update-7.01_508.pdf
- <https://www.waste360.com/business/li-ion-battery-fires-unfairly-cost-waste-recycling-and-scrap-operators-over-12-billion>

References

- <https://www.linkedin.com/pulse/2019-report-annual-reported-waste-recycling-facility-fires-fogelman/>
- <https://publications.gc.ca/site/eng/9.871296/publication.html>
- <https://arxiv.org/abs/2012.07177>
- <https://arxiv.org/pdf/1506.02640.pdf>

Thanks for Watching!