

Team Copy Waste

Vlog 2

Sept. 24, 2021 - Oct. 8, 2021



IN PARTNERSHIP WITH
PRAIRIE ROBOTICS



THE TEAM



Nolan Flegel
Machine Learning



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Front-End Services



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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



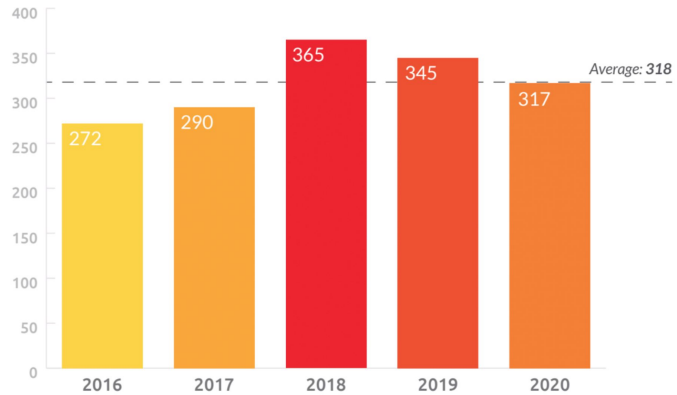
<https://www.cbc.ca/news/canada/saskatchewan/crews-fighting-fire-at-crown-shred-and-recycling-1.5980051>

<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

Example pictures for damage classes of portable batteries:

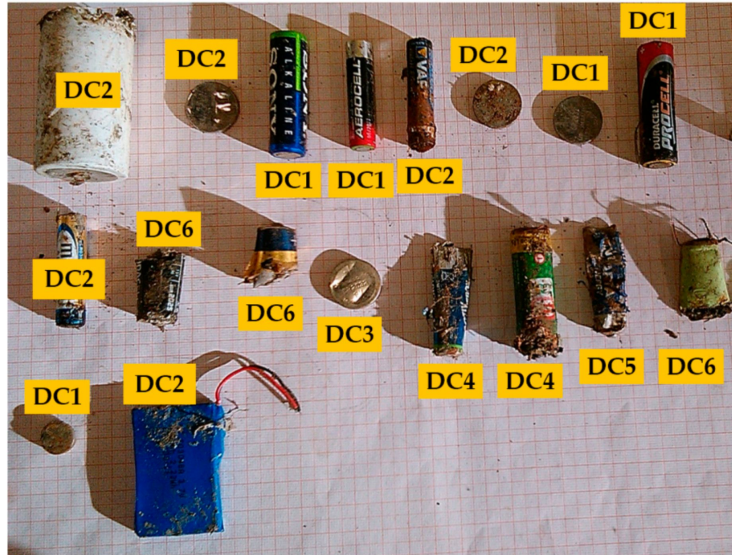


Figure S1. Damage classes of end-of-life portable batteries (after sampling campaign).



Figure 11: Photo of firefighters battling the Larimer County LIB fire. Firefighters hosing down the Larimer County LIB fire after the combusted pile of recyclables was moved outside by a MRF operator. Photo courtesy of Larimer County Solid Waste 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

Partnership

Prairie Robotics will serve as
our industry partner



Our Customer

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



Team Activity

- Meetings
- Prairie Robotics Technology
- Research
- Project Management Setup
- Mitacs



Individual Contributions



- Collecting False Positive dataset
- Documentation
- Research on YOLO
- Meetings/Discussions

Individual Contributions



- Presentations on State of GIS and its use
- Documentation
- Research on Yolo and its variants
- Collect false positive image datasets
- External Discussions

Individual Contributions



- Documentation
- Green Screen – Front End Dashboard
- Integrating with Prairie Robotics
- Front-end Architecture Startup

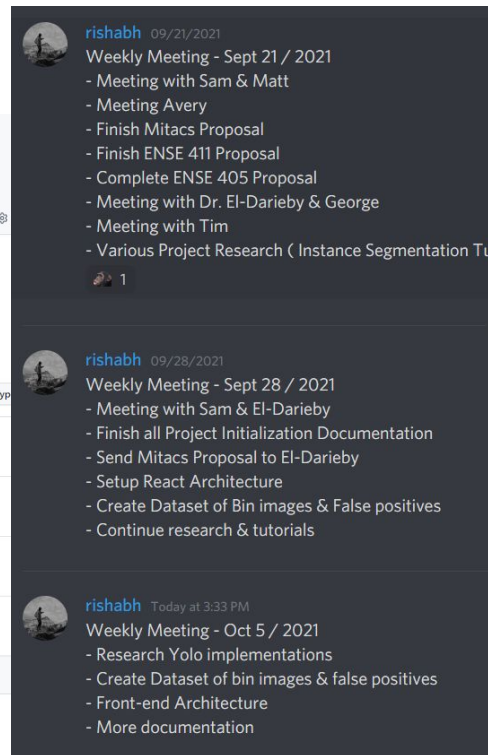
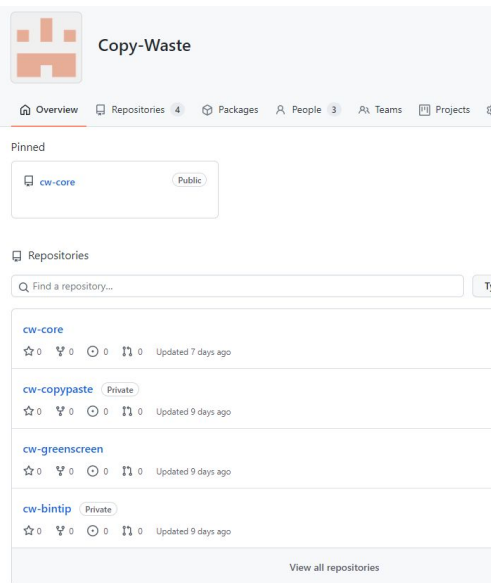
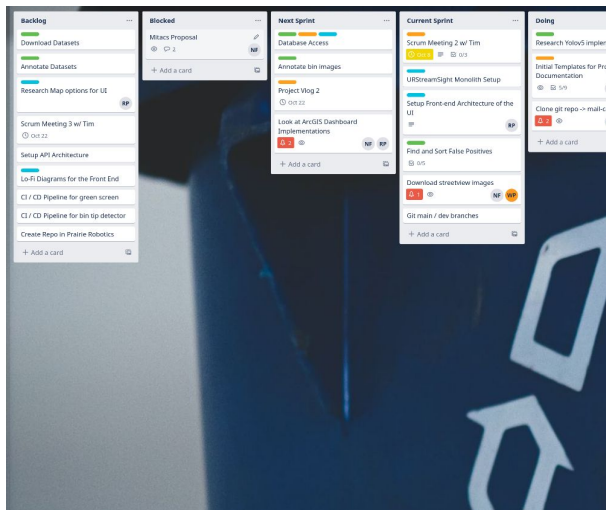
STATUS
GREEN

Project Issues / Changes

No Issues at this time,
however, Mitacs report
has not been submitted



Knowledge Management Overview



Bin Tip Overview







Bin Tip Overview





Green Screen Overview

main 1 branch 0 tags Go to file Add file Code

 **rishabhprasad** docs(update): Updated Technology Configuration Inventory ad5b21a · 2 days ago 🕒 5 commits

 Documentation	docs(update): Updated Technology Configuration Inventory	2 days ago
 Vlogs	docs(vlog): add introduction vlog	8 days ago
 README.md	docs(vlog): add introduction vlog	8 days ago

 README.md 

🔗 Green Screen

This project's focus is on sustainability [Goal 11 - Sustainable Cities and Communities](#).

This project is in partnership with [Prairie Robotics](#).

🔗 Project Background

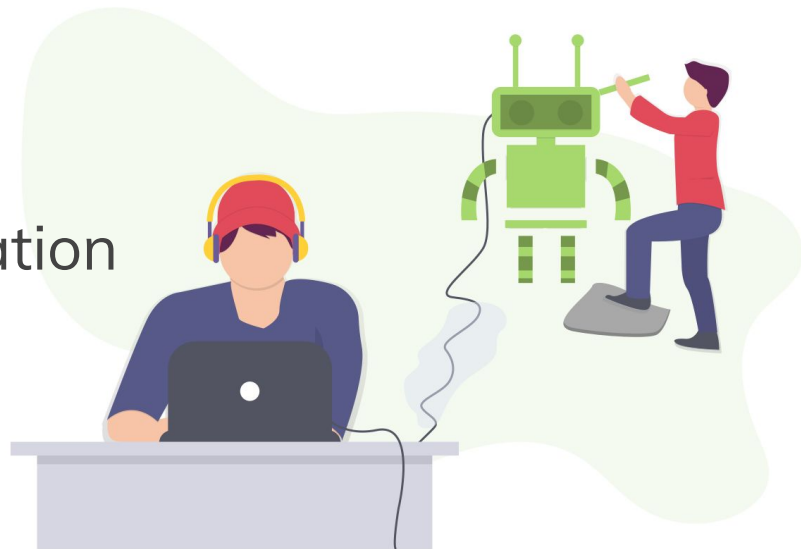
Recycling within the City of Regina is heavily contaminated, inefficient, and expensive. These contaminants lead to a significant amount of recyclables being redirected to landfills. This is unsustainable for the city but also unacceptable and irresponsible to actively harm the environment knowing improvements can be made. In its current state, the collected recycling data is difficult to visualize and analyze in order to educate the public effectively on better recycling habits.

🔗 Business Need / Opportunity

I believe there is a large area of improvement in utilizing this data which is being collected regularly and displaying it in a manner in which it is easily digestible to waste management operators. Events for hazardous waste detected in recycling, common contaminants, neighborhoods which tend to contaminate, among other information should all be

Next Up

- More Documentation!
- Front-end Architecture Development and Integration
- Universal Bin Detector



Reflection

- Does the team feel "on track"?
 - We believe we are still on track.
- What progress does the team particularly feel good (great) about?
 - Lots of Conversations
 - Our Research
 - Better Understanding of Business Needs

Reflection

- What barriers (if any) does the team feel are a current impediment to success?
 - Still awaiting feedback upon our Mitacs proposal.
- What help (if any) does the team require to move positively forward?

Review project initialization documents with Stakeholders

Reflection

- What questions or concerns does the team have (if any)?
 - Processing power of edge device

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!