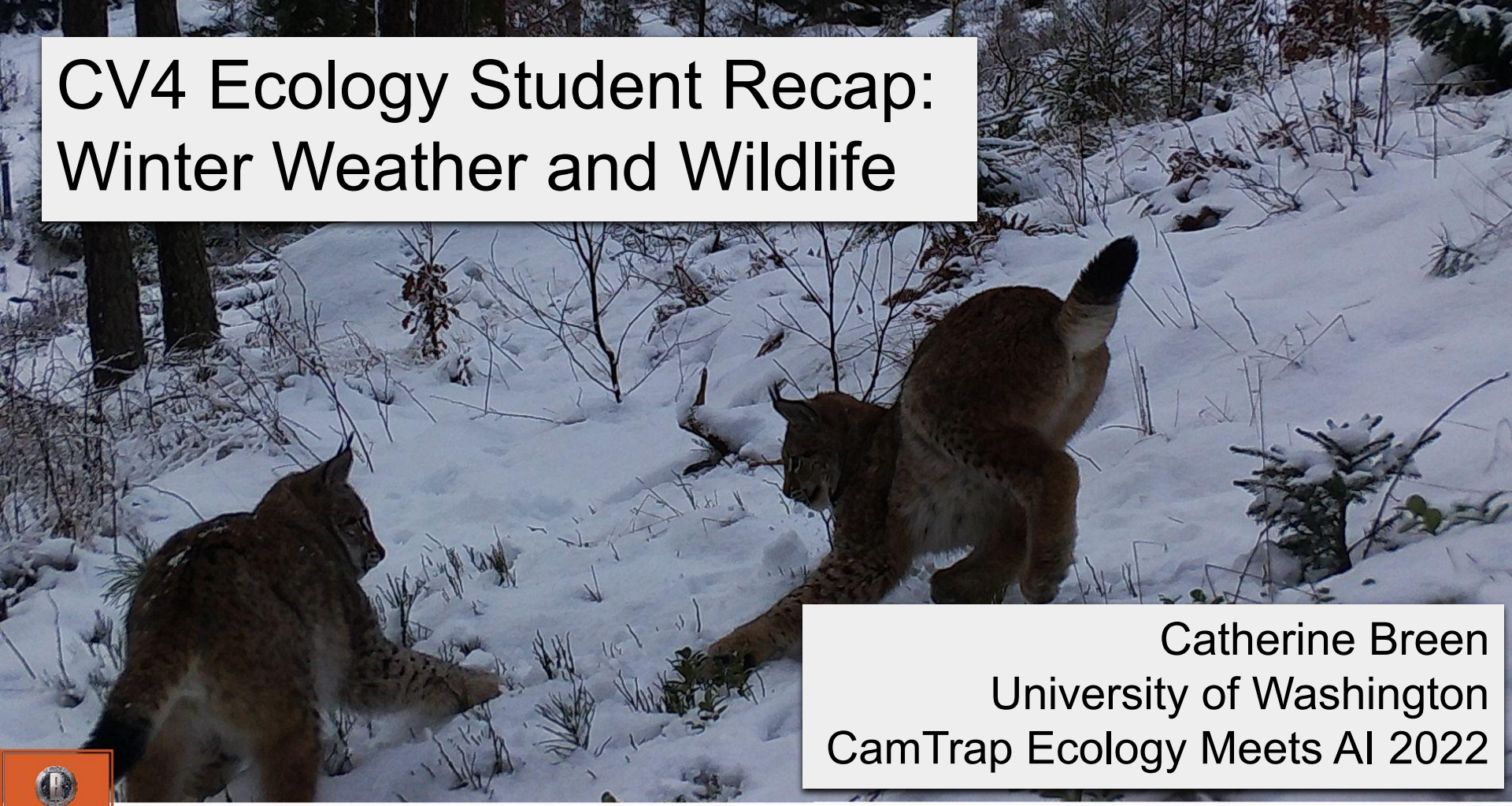
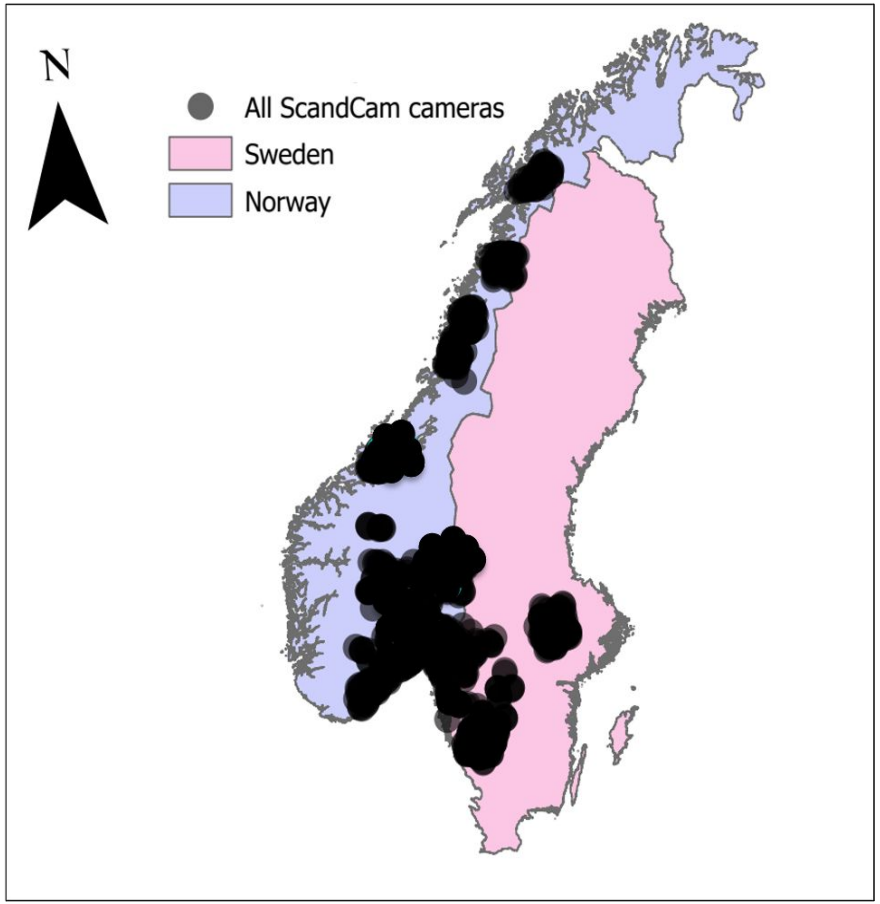
CV4 Ecology Student Recap: Winter Weather and Wildlife



Catherine Breen
University of Washington
CamTrap Ecology Meets AI 2022

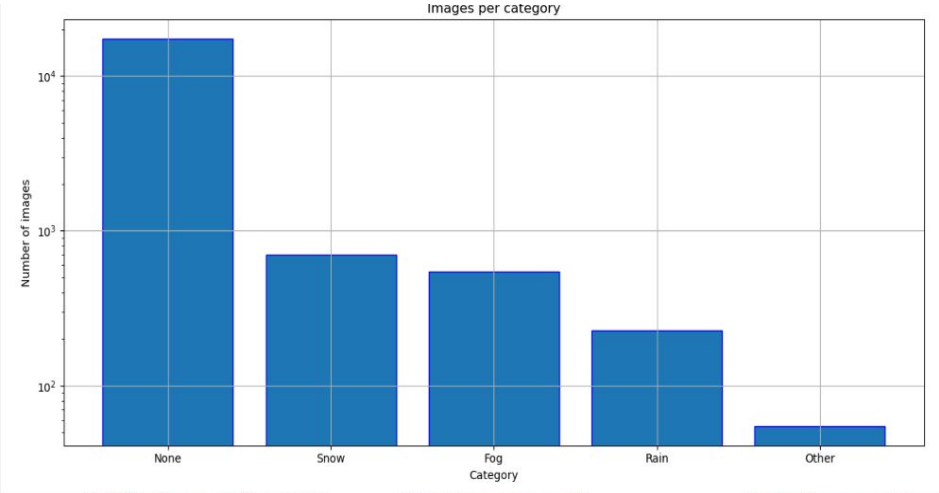
Background


LSTO58
28℉-2℃
01-18-2018 16:03:01


N
All ScandCam cameras
Sweden
Norway

How can we use AI to detect **winter weather** from wildlife cameras?

Unique challenges of an ecology dataset



None Snow Fog Rain Other

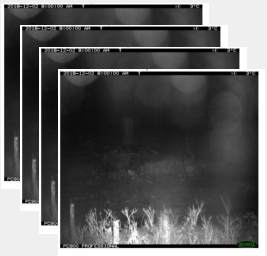
3 winter seasons of data

- 2017-2018
- 2018-2019
- 2019-2020

>1000 cameras and 15,000+ images!

Ecology datasets tend to be imbalanced and the model is only as good as your data!

Approaching ecology from an AI perspective



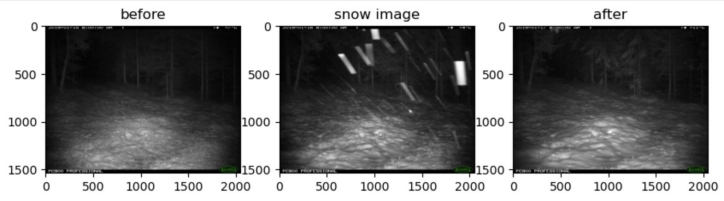
Labeled Images

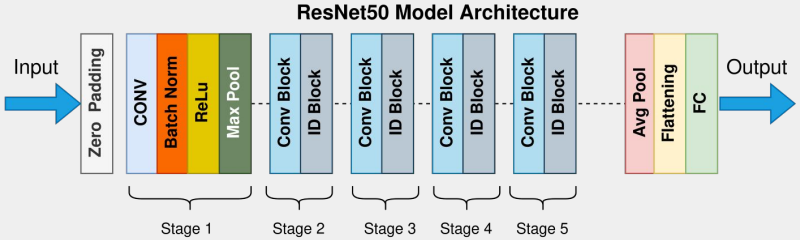
TRAIN:
2017-2018,
2019-2020

TEST:
2018-2019

RGB

OR





???

Pre-existing code bases can be utilized for ecological application:
https://github.com/CV4EcologySchool/snow-Dayz

Interpreting AI results for ecology application

Binary model (Weather vs. No Weather)

Time Sequence	# classes	Epochs	Accuracy	Precision	Recall	F1 score
None	**2**	**128**	**0.91**	**0.56**	**0.52**	**0.52**
Sequence	2	128	0.91	0.59	0.38	0.47

Weather?

What's hard for humans is hard for AI

true: 1, pred: 0.5900901

true: 0, pred: 0.036053687

true: 1, pred: 0.8711599

true: 1, pred: 0.9969715

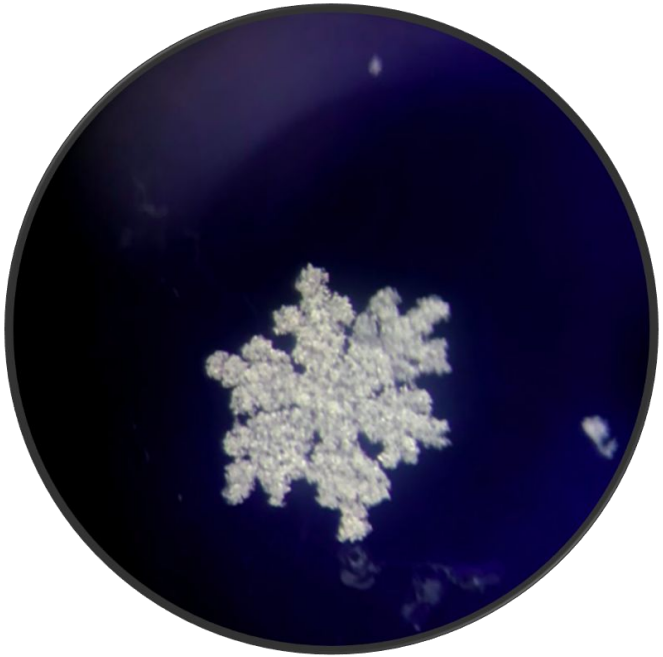
true: 1, pred: 0.96883416

true: 0, pred: 4.4582077e-05

AI can simplify the problem by acting as a “first pass” on data

Lessons learned and next steps!

- AI can **simplify** the problem even if expert opinion is later required
- Ecology can reveal open problems in machine learning
- Collaboration is key :)



Thank you!

- Sara Beery
- Jason Parham
- Benjamin Kellenberger
- Suzanne Stathatos
- Tarun Sharma
- Justin Kay
- Laura Prugh

Please reach out!
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