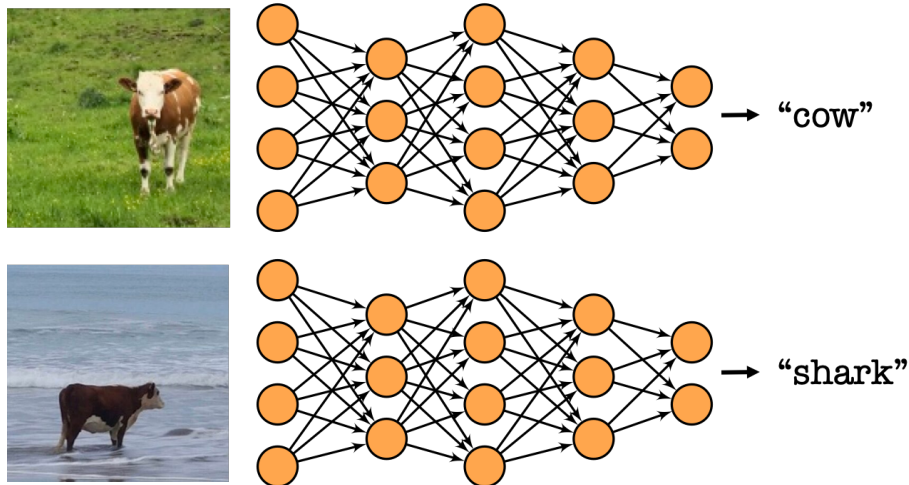


Deep Learning for Classification Out-of-Context: How Much Do Deep Networks Rely on Backgrounds?



Deep neural networks (DNNs) are shown to be largely vulnerable to common image corruptions or naturally caused perturbations. At test time, unlike human visual perception, very simple changes in the image content (e.g., background, weather, brightness or contrast settings, etc.) can cause the input images to lie far from the in-distribution density introduced by the training set images, hence leading to a significant performance loss in terms of generalization. In this project we want explore this phenomenon, towards generalization and robustness in out-of-distribution settings. We will particularly focus on the problem of image background bias of state-of-the-art deep learning architectures. We will explore recent methods for out-of-distribution input detection when an image background changes, and develop novel approaches towards addressing this problem.

Goals & Tasks

- Review of the state-of-the-art on generalization of image classification models.
- Implementation of DNNs for image classification and experimenting with datasets with background bias.
- Exploring and extending novel out-of-distribution input detection methods.

Contact

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Qualifications

- Interest in deep learning.
- Experience with Python based deep learning frameworks such as TensorFlow or PyTorch are beneficial.
- Registered to one of the following:
 - ✓ Bachelor Thesis
 - ✓ Seminar Project
 - ✓ Master Thesis