Identifying animals in camera trap footage

The island conservation dataset

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Module: Machine Learning Lab
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Date: November 24, 2020

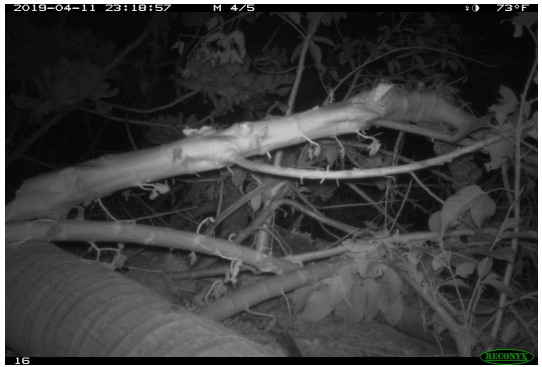
Motivation

- **Why camera traps?**
  - non-invasive method to monitor wildlife
- **Why islands?**
  - exceptionally high biodiversity
  - endangered due to invasive species (rats, cats, etc.)
- **Why me?**
  - background in biology

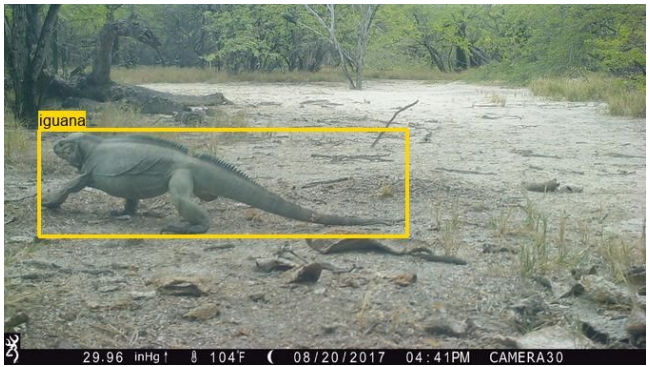
Data

- **What?**
  → 100k labeled images from camera traps
  → 50% images with bounding boxes
  → 60% empty, 47 animal classes, very imbalanced
  → day & night-time
  → bursts of 3-8 photos when motion detected

- **Where?**
  → 7 islands in 6 countries (Pacific Ocean & Caribbean)



Micronesia, Ulithi Atoll



Dominican Republic, Cabritos Island

Baseline & Model

Baseline: majority class

= always predicting an empty image

Model: Convolutional Neural Networks (CNNs)

- default method for image data
- finding a suitable architecture
  - number & size & types of convolutions
  - pooling
  - number & size of fully connected layers
- start with insights from literature (ResNet-18)

Outlook

- **Decide for preprocessing steps**
  resizing, data augmentation,...

- **Literature Research**
  → What has previously been done and why?
  → Transfer learning vs. training from scratch
  → ensemble learning: top-1 vs. top-5 score