Great Barrier Reef Starfish Detector

Team 8

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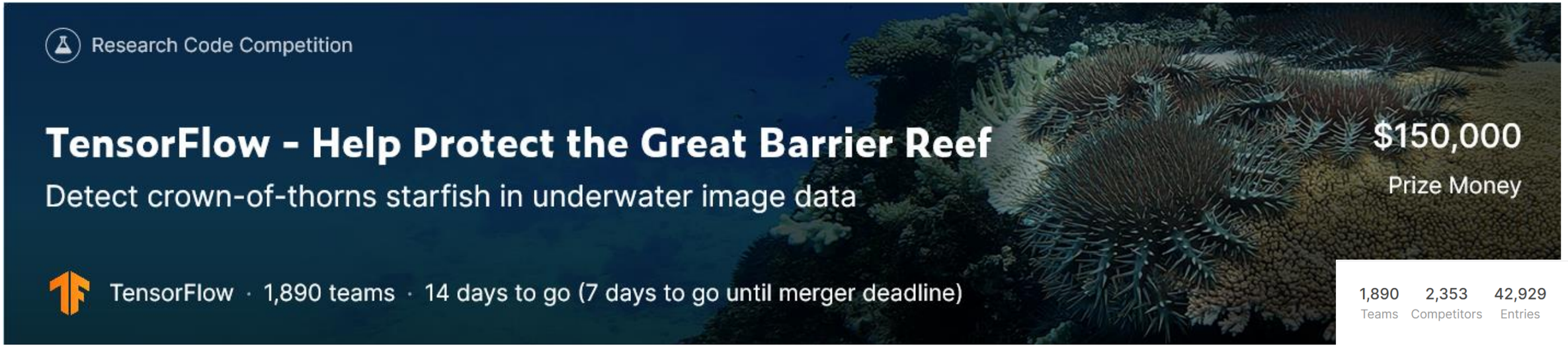
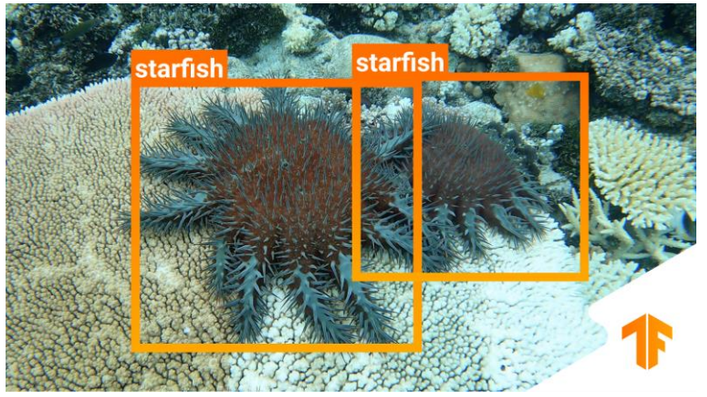
1 Problem Statement



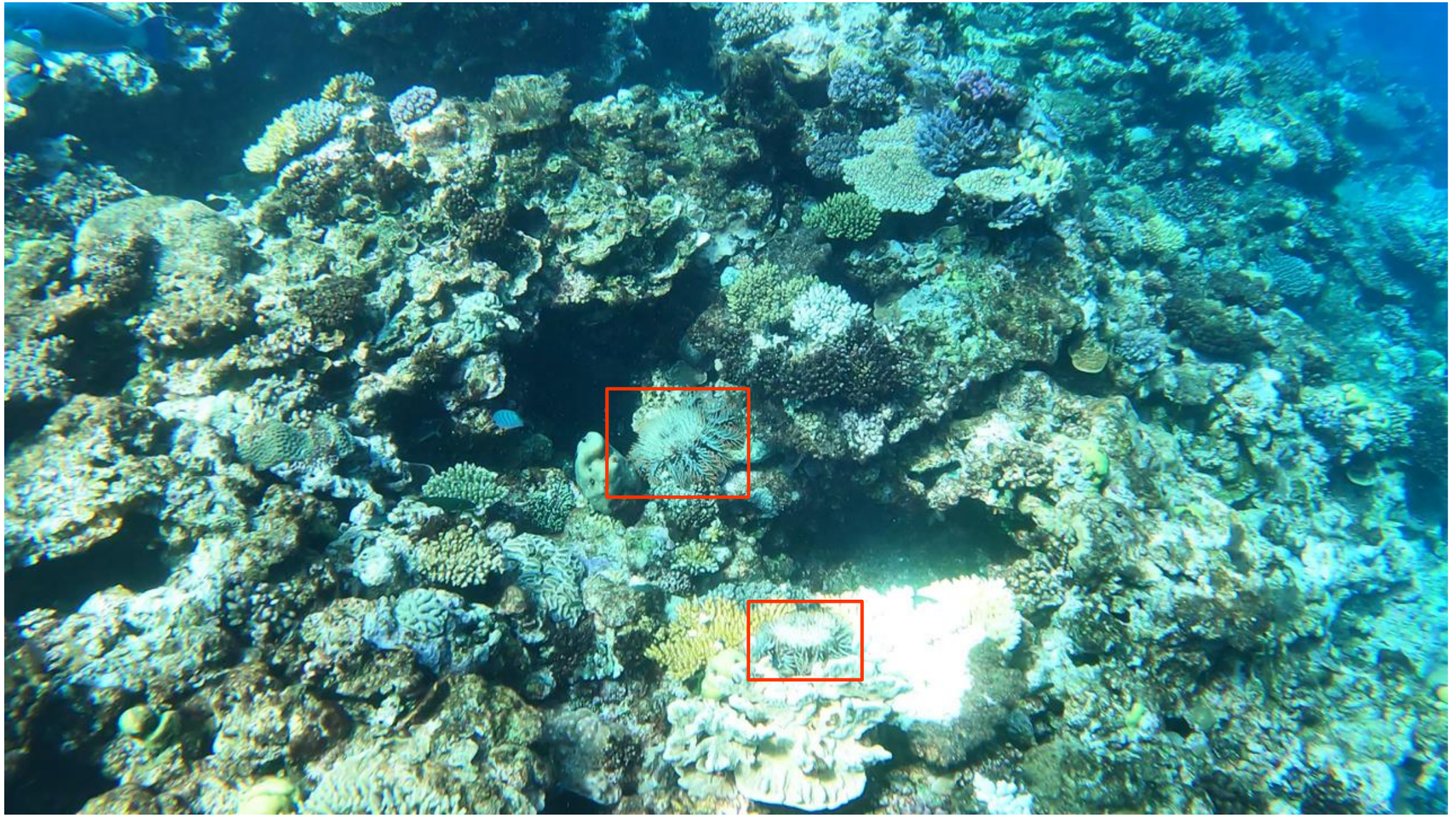
https://www.kaggle.com/c/tensorflow-great-barrier-reef/overview/description

Our goal: Implement a YOLO object detector from scratch

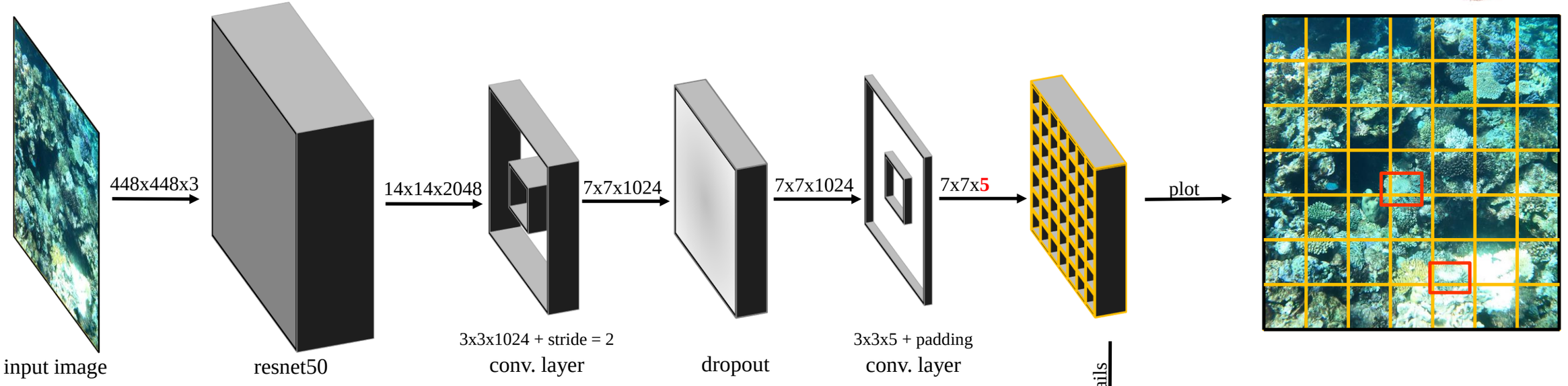


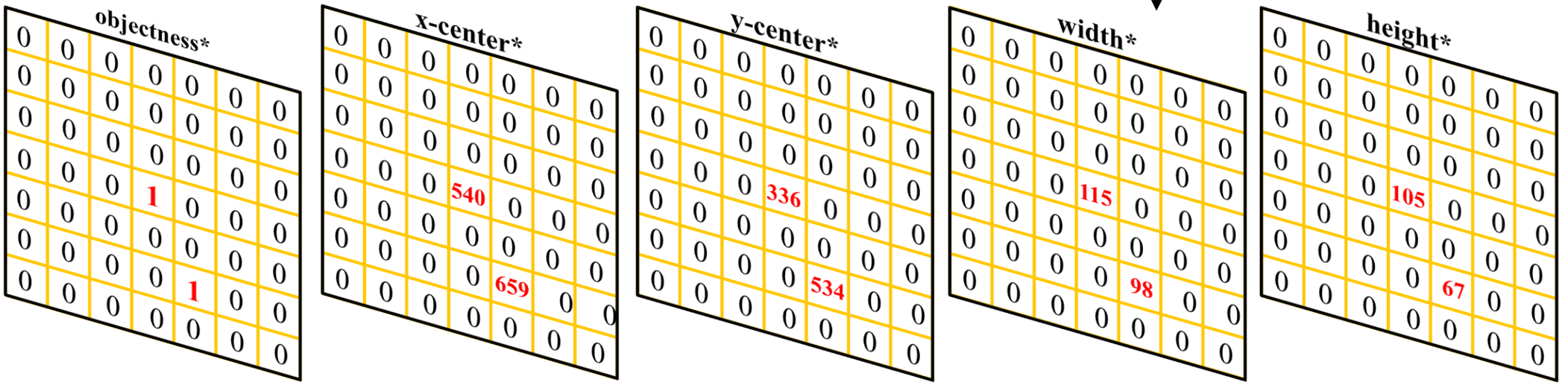
https://www.google.com/url?sa=i&url=https%3A%2F%2Fblog.tensorflow.org%2F2021%2F11%2Fannouncing-tensorflows-kaggle-challenge.html&psig=AOvVaw3pZWcfWwVYD7HMyphUNG62&ust=1643789767389000&source=images&cd=vfe&ved=0CAsQjRxqFwoTCNCrpJ6I3vUCFQAAAAAdAAAAABAJ

1 Problem Statement



2 Our YOLO Architecture





* For simplicity the values are denoted as pixel values. The implementation is relative to the grid.

3 Approach

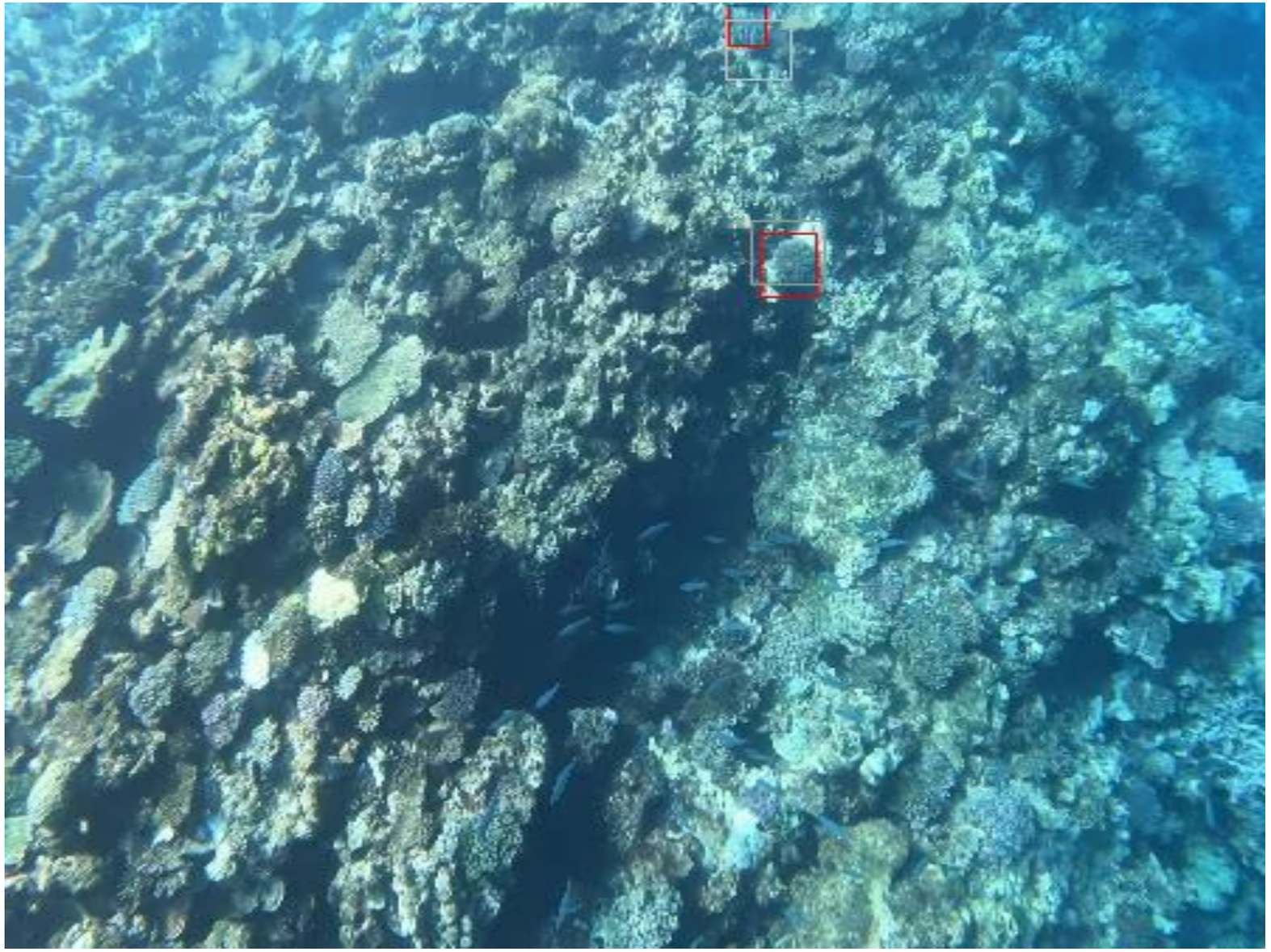
- Detection input pipeline
- Label conversion
- YOLO architecture
- Custom loss function
- Visualization

- Optimize the input pipeline
- Transfer learning
- Metrics
  - IOU
  - TP-rate / TN-rate
  - Separate Loss functions

- Data augmentation
  - color jittering
  - horizontal & vertical flip
- Dropout
- Smaller model capacity

…more during breakout!

4 Results



Ground Truth

Estimate

white: objectness = 1, black: objectness = 0

Thank you

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