Image Segmentation

PDSG Applied Data Science Meetup

Network: PSU_Accelerator_Guest. Data at **http://dive-into.info**

March 3, 2019

Meetup Structure

Our goal: Supportive peer learning, with actual coding and working with data. At the end of a series, ideally have a completed project.

- 15 min intro to data
- Brainstorming about approach
- Playing with data (exploring, loading, coding, chatting)

Sampled data is at **http://dive-into.info** (then press up)

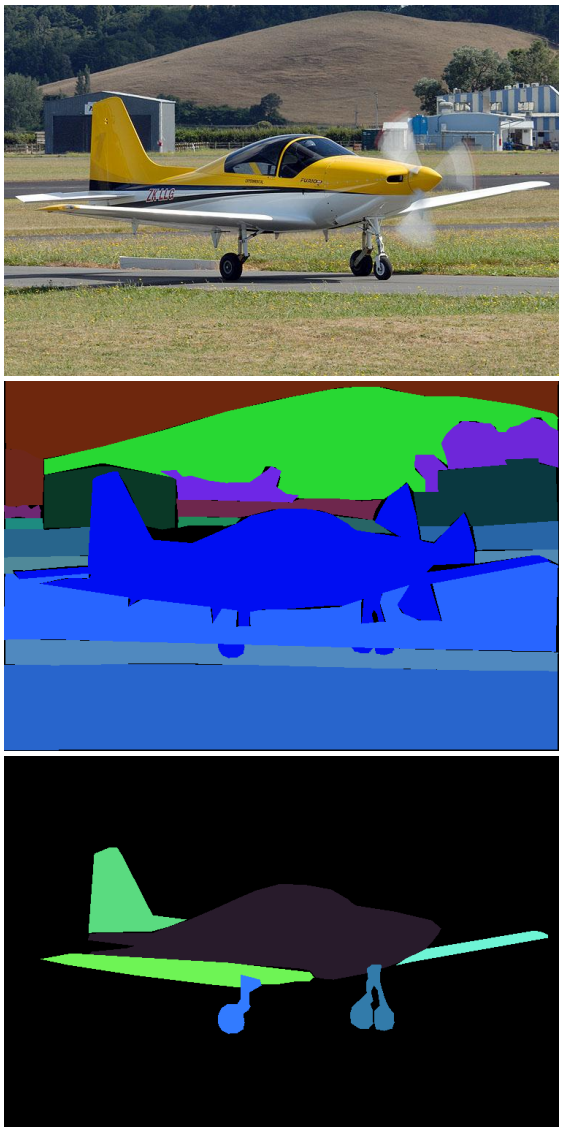
Admin Stuff

- Data is at **http://dive-into.info** (then press up)
- Sponsors: PDX Code Guild, Tura.io, Megh Computing, APDM
- Parking (behind this building or on road)
- Slack channel:**https://portlanddata.slack.com** invite at meetup.com.
- Thanks to: Matt B., John B., Ryan, Kenny, Josh, Julie, Zac, Tal, Isil

Original Data Source

MIT ADE20K image set

- 20,000 hand-segmented and annotated images
- 4GB! Please only download at home.
  - Initial image (JPG)
  - Segmentations and Parts (PNGs)
  - Annotation (TXT)
- Index MAT file with metadata about whole set.



(http://groups.csail.mit.edu/vision/datasets/ADE20K/)

Reduced Data: Smaller images, only segmentation

Matt B. downsampled to smallest images across whole set **(www.dive-into.info)**

- Small (1147 images, 24MB)
- Medium (5231 images, 204MB)

Each instance has:

- Image (JPG)
- Segment (PNG)

Also flattened directory structure to just train/test.
John B. converted index into 4 CSVs for easier access. (Should be on slack)

What's up with those colors? Labelling

- Each segment is labelled with a class (contained in ADE20K_index_object) e.g. airplane=14, cliff=525, tree=2856 (Note: MATLAB indexing starts at 1)
- Each pixel encodes the class in RG channels: Pixel_class = (R/10)*256+G.
- Instances are in blue channel, uniformly split between 0, 255

Not necessary for segmenting, but needed for labelling the segments. Should aim for segmenter initially.

Brainstorming

30 min brainstorming, then report back to group

- How would you segment these images?
  - Fundamental approaches
  - Libraries
- Basic data questions too. (how many, how big, topics)

Extra details

Original Data Structure

- Directory: `images/training/<letter>/<topic>/`
- File name: `<file\_tag>= ADE\_train\_<number>`
  - Original: `<file\_tag>.jpg`
  - Coarsest segmentation: `<file\_tag>\_<number>.png`
  - Finer parts: `<file\_tag>\_<number>\_parts\_<iter>.png`
  - Annotations: `<file\_tag>.txt`

Attribution Text: Hash-delimited file

```
Instance in layer # Part layer # ? # Synonyms # Label
```