# Automatic Image Labelling System

Jing Peng, Jiashu Chen, Yi Yang

## COLUMBIA UNIVERSITY
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# Motivation & Goal

- Data labelling is consuming both in time and human resources, especially for image classification and detection work. We want to implement a **Automatic Image Labelling System**.

- The **Automatic Image Labelling System** returns labelling result (category, bounding-box coordinates) for user to make slight modification.

- The **Automatic Image Labelling System** will absorb user's new images into its training dataset for further training, in order to improve its performance.

# Data

- Collect raw images from Internet
- Making annotations(class, bounding-box) using *LabelMe*
  https://en.wikipedia.org/wiki/LabelMe
- Change annotations into *COCO/LVIS* format
  https://www.lvisdataset.org/
  https://cocodataset.org/#home
- Starting with a relatively smaller dataset (around 300 imgs for each class)
- Dividing into training dataset and testing dataset, approximately 7:3

# Methods

## Feature Extraction
- ResNet-18/34
- Feature Pyramid
- Pretrained Model

## Proposal Generation
- One-stage
- Two-stage
- Loss Function

## Regression
- Classification
- Bounding-box
- $\cdots$

## Algorithms
- Back-Propagation
- Gradient-Descent
- Non-Maximum Suppression
- Visualization via OpenCV
- $\cdots$

# System

## Frontend:

- A operation window for users to interact with the application.
- Allow users to upload their images to be labelled.
- Show the annotations from the model in the backend.

## Backend:

- Call a forward propagation to generate labelling results.
- Enlarge its training dataset by absorbing users images.
- Start periodical training to update its deep-learning model.

# Schedule

- Data Collection
  - Timeline: Nov.8-Nov.12
  - Assignee: Yi Yang
- Model Training
  - Timeline: Nov.15-Nov.24
  - Assignee: Yi Yang, Jiashu Chen, Jing Peng
- Frontend Design and Implementation
  - Timeline: Nov.10-Nov.26
  - Assignee: Jing Peng
- Backend Design and Implementation
  - Timeline: Nov.24-Dec.3
  - Assignee: Yi Yang, Jiashu Chen