

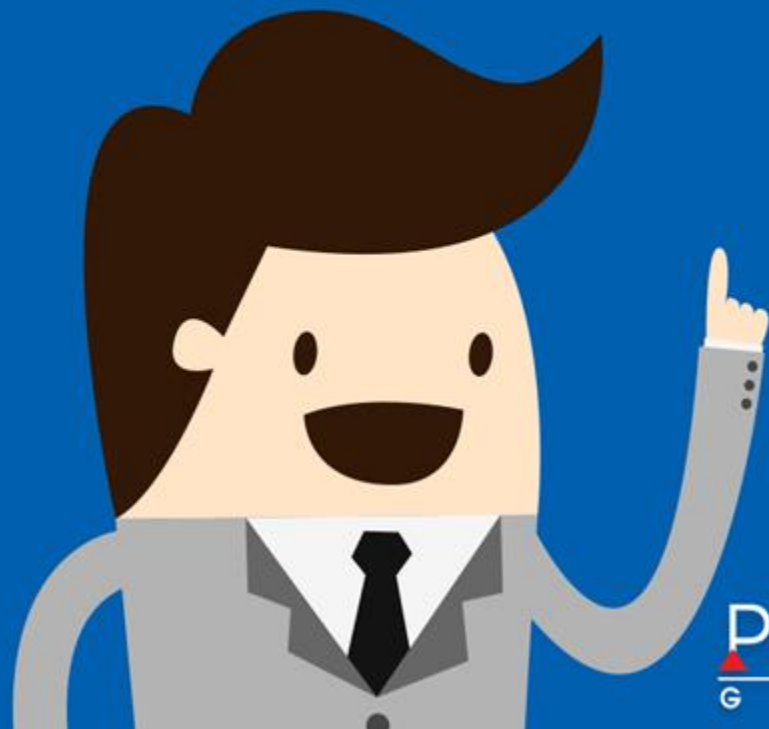


CRIME

# PROACTIVE

VS

# REACTIVE



PacRim  
GROUP



# Process flow



Side-technology:  
Team collaboration on GitHub  
<https://github.com/BADS-NIDA/images-analytics>

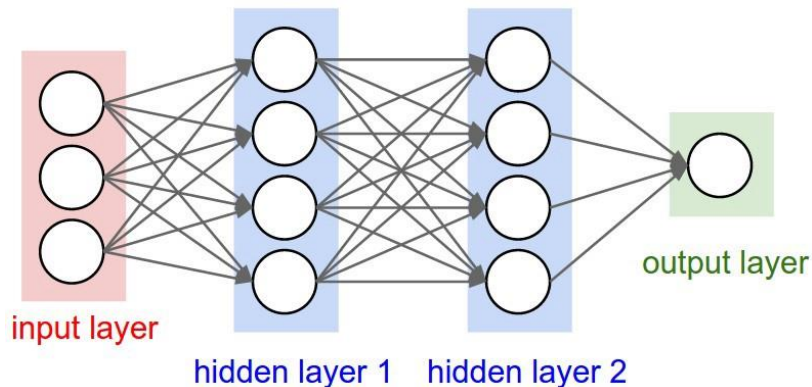


# Choosing Algorithm

Goal: Good precision and Fast Detection



$\wedge$



**YOLO**  
V2

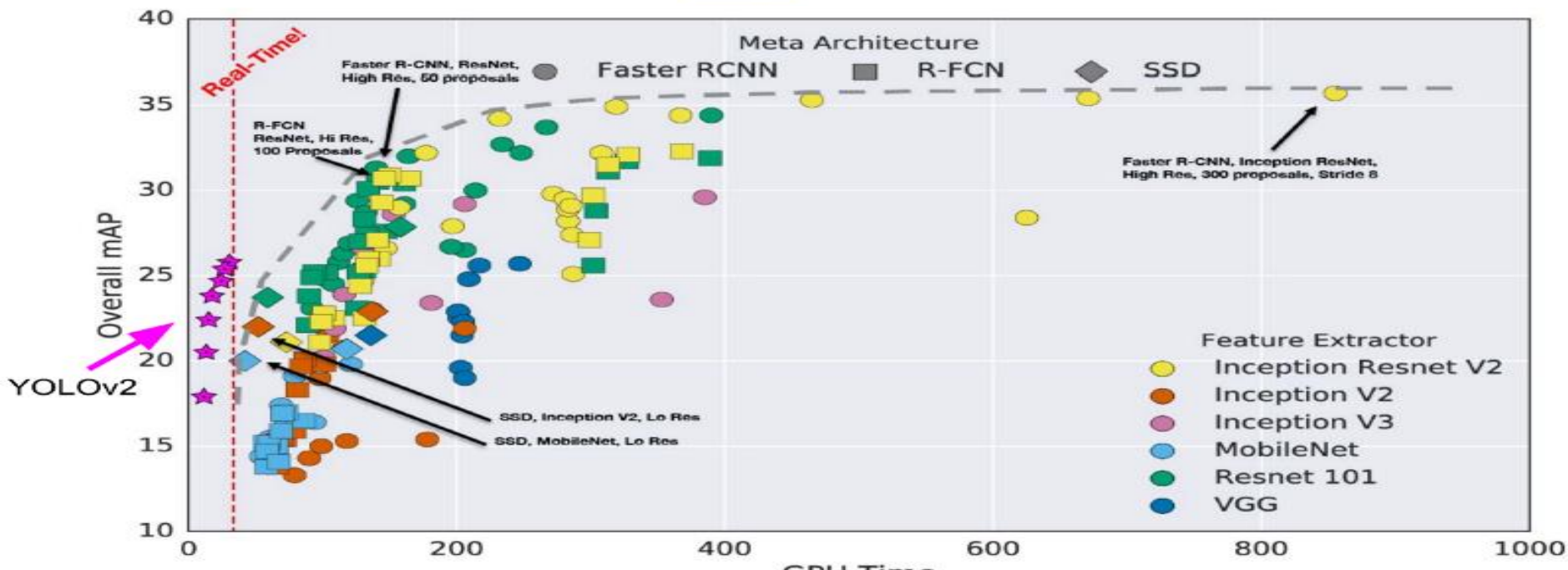
# Choosing Algorithm

R-CNN



Speed!!!

< YOLO V3 < YOLO V2

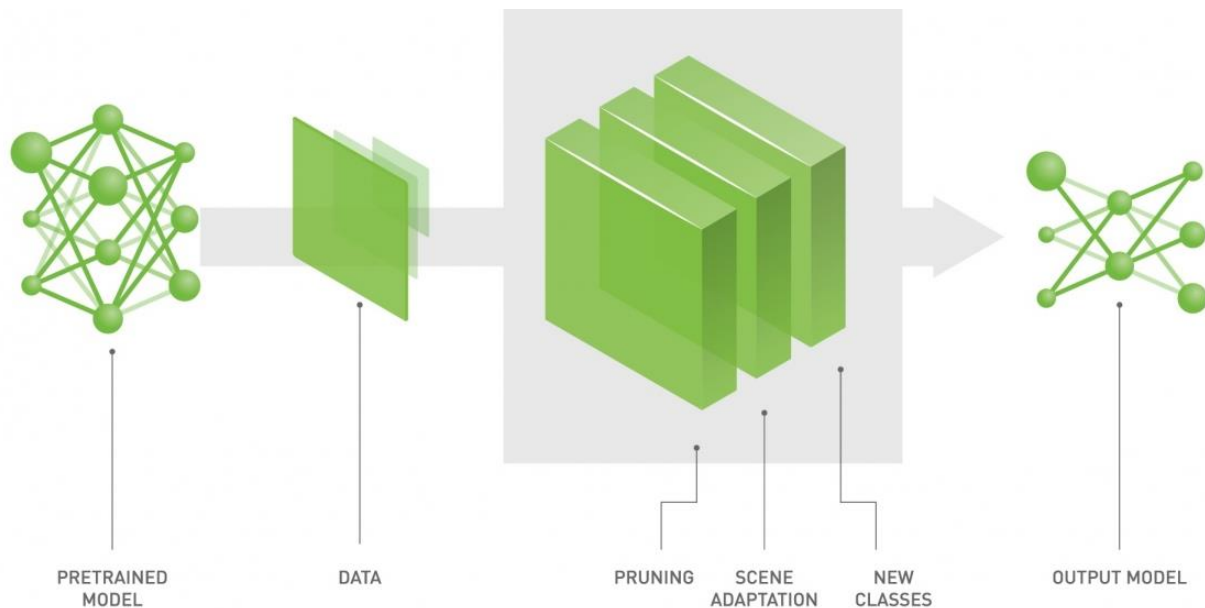


# Choosing Algorithm

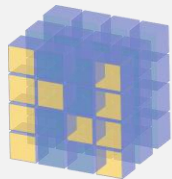
Task Challenge: No interested class label



Transfer learning



# Acquiring Data

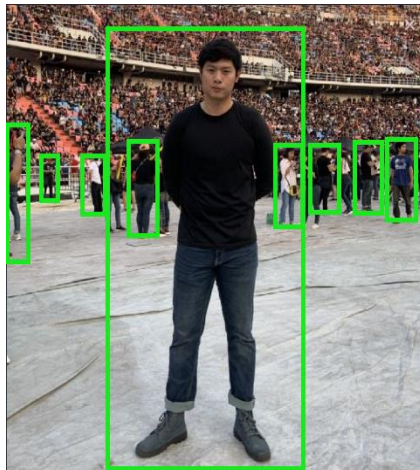


NumPy

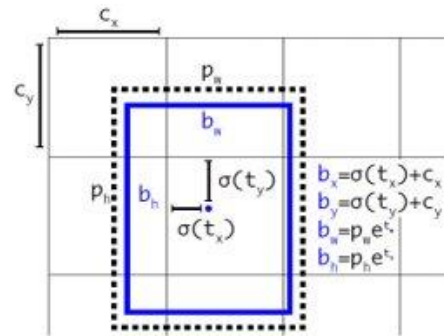
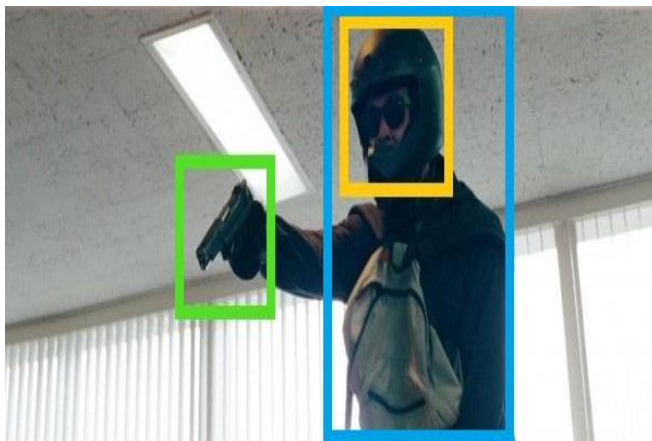
BeautifulSoup



# Data Preparation



```
<annotation>
  <folder>images</folder>
  <filename>helmet503.jpg</filename>
  <segmented>0</segmented>
  <size>
    <width>1280</width>
    <height>720</height>
    <depth>3</depth>
  </size>
  <object>
    <name>helmet</name>
    <pose>Unspecified</pose>
    <truncated>0</truncated>
    <difficult>0</difficult>
    <bndbox>
      <xmin>948</xmin>
      <ymin>296</ymin>
      <xmax>1063</xmax>
      <ymax>405</ymax>
    </bndbox>
  </object>
</annotation>
```



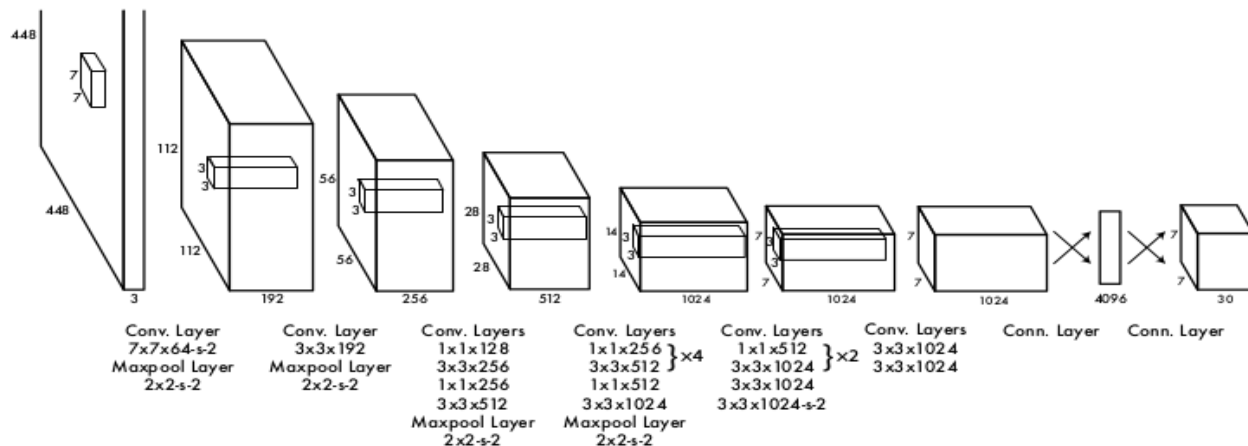


# Training Model



Darkflow : Implementation of Darknet-YOLO framework with Python TensorFlow

TensorFlow: Python3.6, CUDA toolkit 9.0, cuDNN 7.4.2, TensorFlow 1.10



Pretraining model: VOC weight, tiny-yolo configuration

# Results



Web Cam



Example Video

# Problems

- Tensorflow-gpu requirements
  - CUDA, cuDNN versions
- Darknet on windows.
- Acquiring data
  - ImageNet
  - Google web scrape
- No data with annotations
- Low accuracy, false alarm
- Limited computing power
- Annotation format

# Solutions

- conda install specific version
  - Separated environment
  - CUDA, cuDNN, tensorflow
- Darkflow
- Multiple sources/keywords
- BBox Label Tools
- More and clean data
- Tiny Yolo
- XML

# Improvements

- Tracking
- Use only helmet full face to train model for better performance
- Add Other face covering object, such as black glasses, mask
- Add Other weapon object, such as knife , baseball bat



<https://github.com/BADS-NIDA/images-analytics>

## รายชื่อสมาชิกกลุ่ม

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