



# First results in insects detection using AI and Deep Neural Networks

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# INTRODUCTION

- Negative influence of insects on the yield of agricultural crops
- Pest control – sticky boards, tapes, traps





# INTRODUCTION

- Negative influence of insects on the yield of agricultural crops
- Pest control – sticky boards, tapes, traps
- Tracking and detection of Apple Codling Moth
- Sticky traps
- ARTIFICIAL NEURAL NETWORKS
- More layers – the greater predictive capability

# MATERIAL AND METHOD OF WORK



01



**TENSORFLOW**

02



**CUDA DEEP  
NEURAL  
NETWORKS**

03



**CUDA**

# MATERIAL AND METHOD OF WORK

01



**TENSORFLOW**

- End-to-end open-source platform
- Tools
- Libraries
- Community

# MATERIAL AND METHOD OF WORK



**02**



## **CUDA DEEP NEURAL NETWORKS**

- GPU-accelerated primitive library
- Provides highly tuned standart routine implemenations
- Normalization
- Pooling

# MATERIAL AND METHOD OF WORK

- Faster model training
- Reduces training time
- Programming model and platform
- Parallel computing

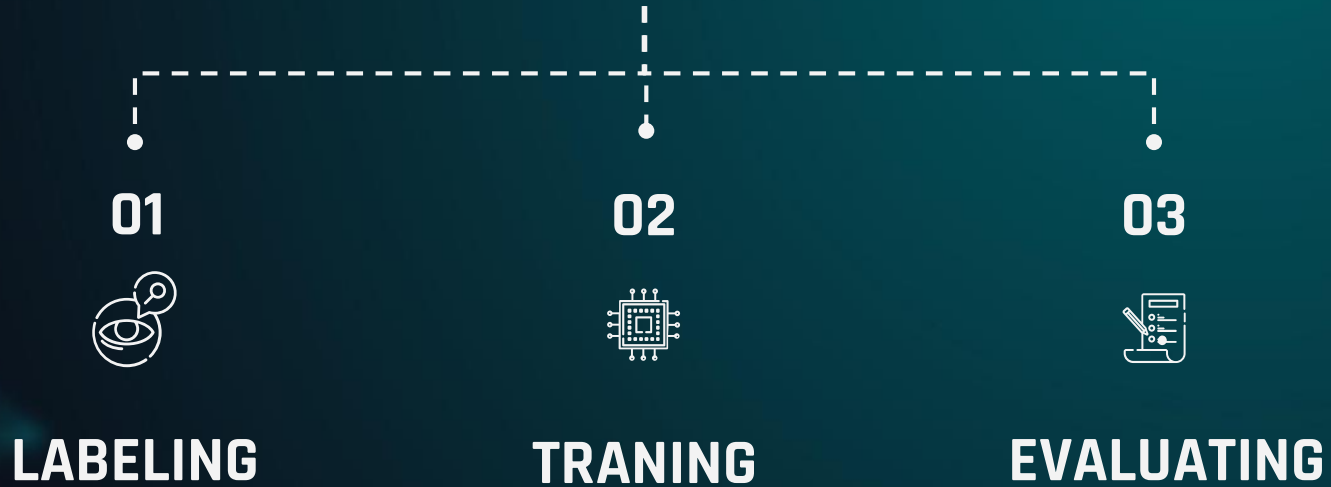
03



**CUDA**



# STEPS OF MODEL CREATING

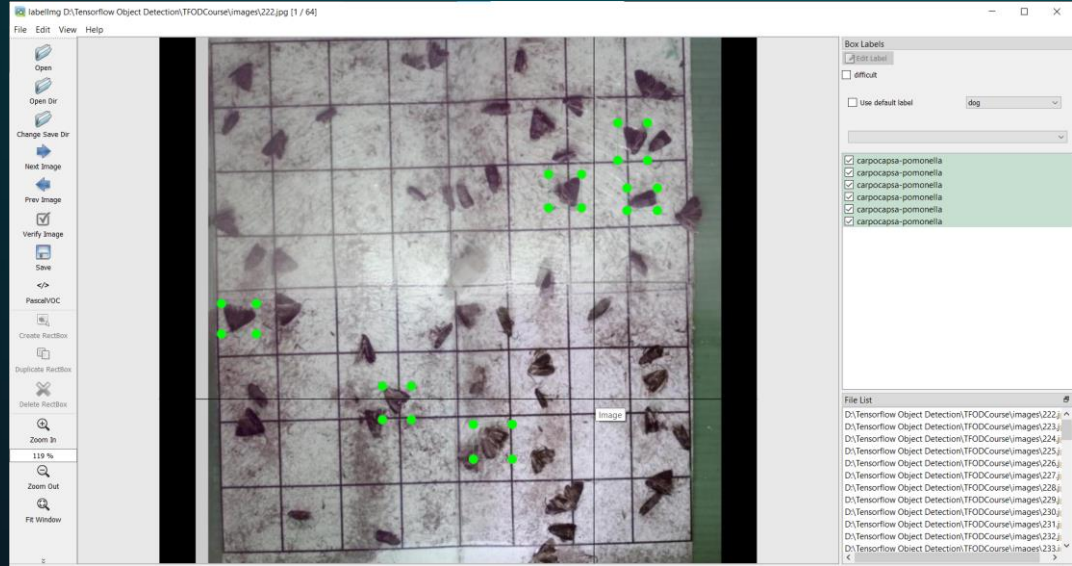


# STEPS OF MODEL CREATING

01



## LABELING



# STEPS OF MODEL CREATING

- MEAN AVERAGE PRECISION:
  - Confusion Matrix (TP, TN, FP, FN)
  - Intersection over Union
  - Recall
  - Precision

03

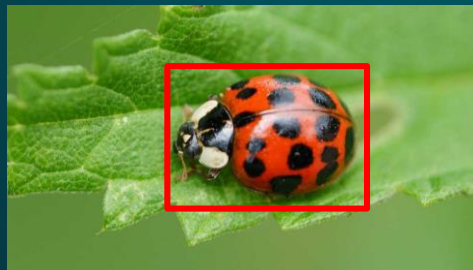


EVALUATING

**TRUE**

**FALSE**

**POSITIVE**



**NEGATIVE**



# STEPS OF MODEL CREATING

- MEAN AVERAGE PRECISION:
  - Confusion Matrix (TP, TN, FP, FN)
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03



## EVALUATING

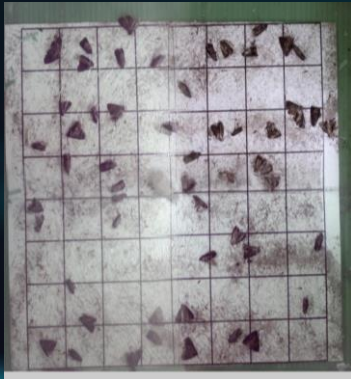


# RESULTS

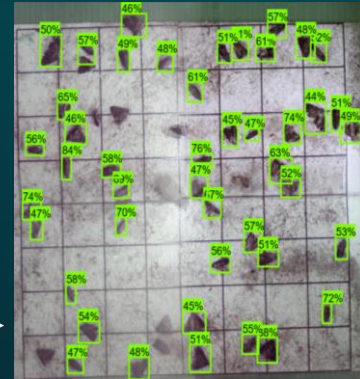
100 IMAGES

3 HOURS

0.69 map



MODEL





*- AI is neither good nor evil.  
It's a tool. It's a technology  
for us to use.*

*Oren Etzioni*