

# Automation Anywhere 1A

Break Through Tech  
AI Studio Virtual



H. Yannick

# Meet the Team!



**Harini Anand**  
San Jose State University



**Makayla Kienlen**  
UC Santa Cruz



**Savannah Gong**  
Arizona State University



**Ananya Aatreya**  
UW Seattle

# Meet the Team!



**Anish Hiranandani**  
Challenge Advisor



**Aditya Mahesha Ballaki**  
AI Studio TA

# Presentation Agenda

1. Project Overview
2. Data Understanding
3. Modeling and Evaluation
  - a.Training YOLO
  - b.Training Detectron2
4. Demo
5. Insights and Challenges

# Our Goal

- Create a computer vision model to locate signatures on various documents
  - Pre-process data from a company data set of over 2000 documents
  - Experiment with Yolo and Detectron2 models and different hyperparameters
  - Create a Streamlit application for model inference



BREAK  
THROUGH  
TECH

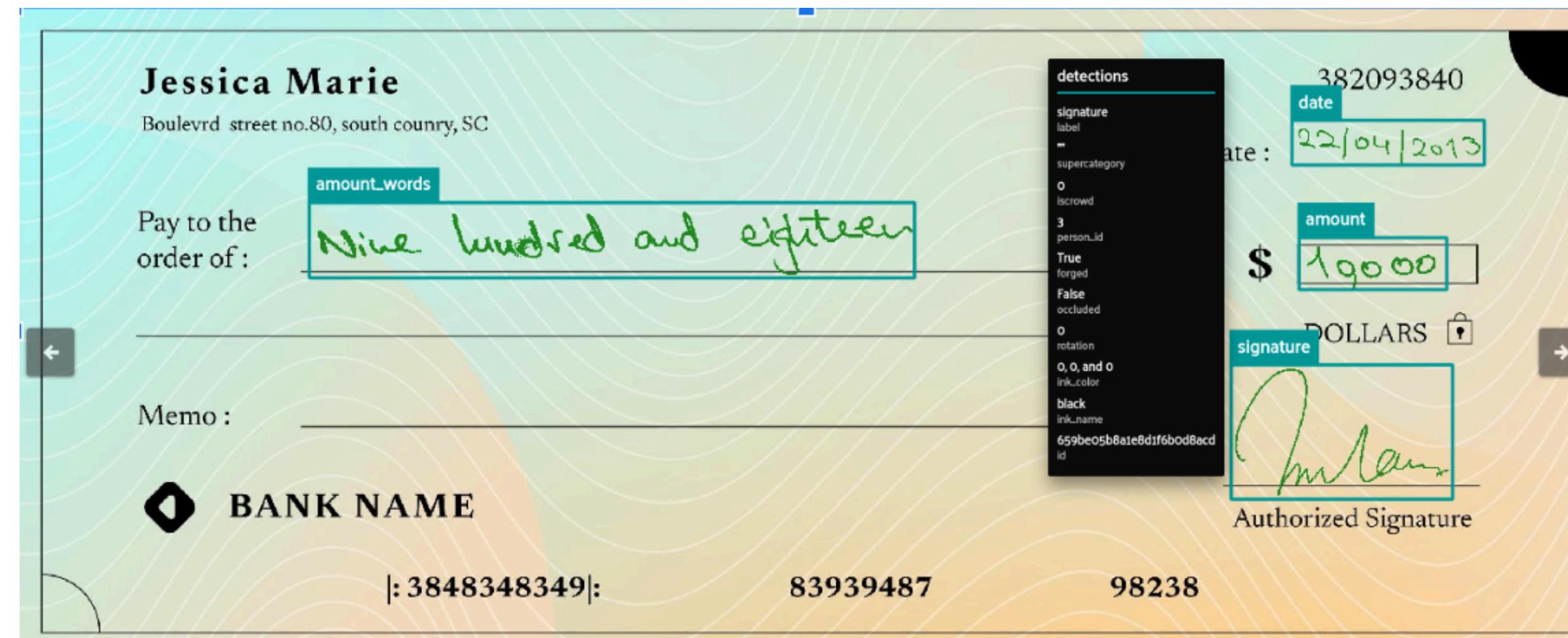
# Business Impact

- Automation Anywhere is an automation success platform that helps users create and run automations (repetitive flows).
- Working with documents and UI screenshots is a very common use case for our customers.
- A key sub-problem in this domain is to segment the image to understand layouts.
- End-to-end pipeline for an ML model

# Data Understanding

Documents, Bank Checks, and Screenshots provided by Automation Anywhere

- Labeled with classes and bounding boxes



# Data Preparation

YOLO

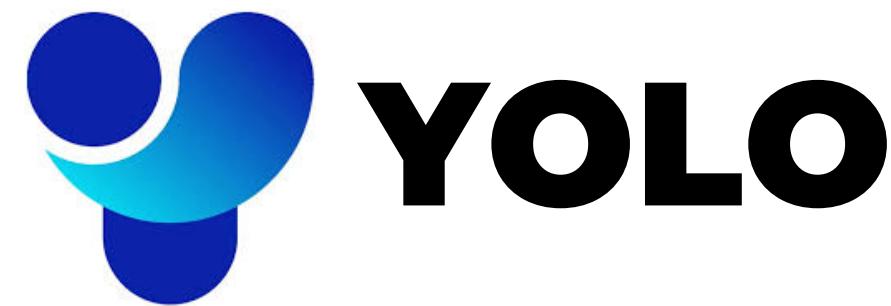
Uses YOLO Format

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{  
    "file_name": "chicago_108.pdf_2.jpg",  
    "width": 1707,  
    "height": 2200,  
    "bbox_yolo": [  
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        0.29291154071470415,  
        0.045  
    ],  
},
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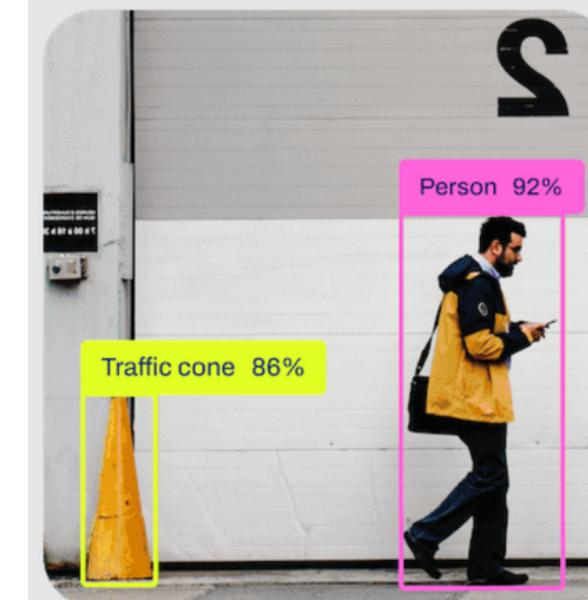
Detectron2

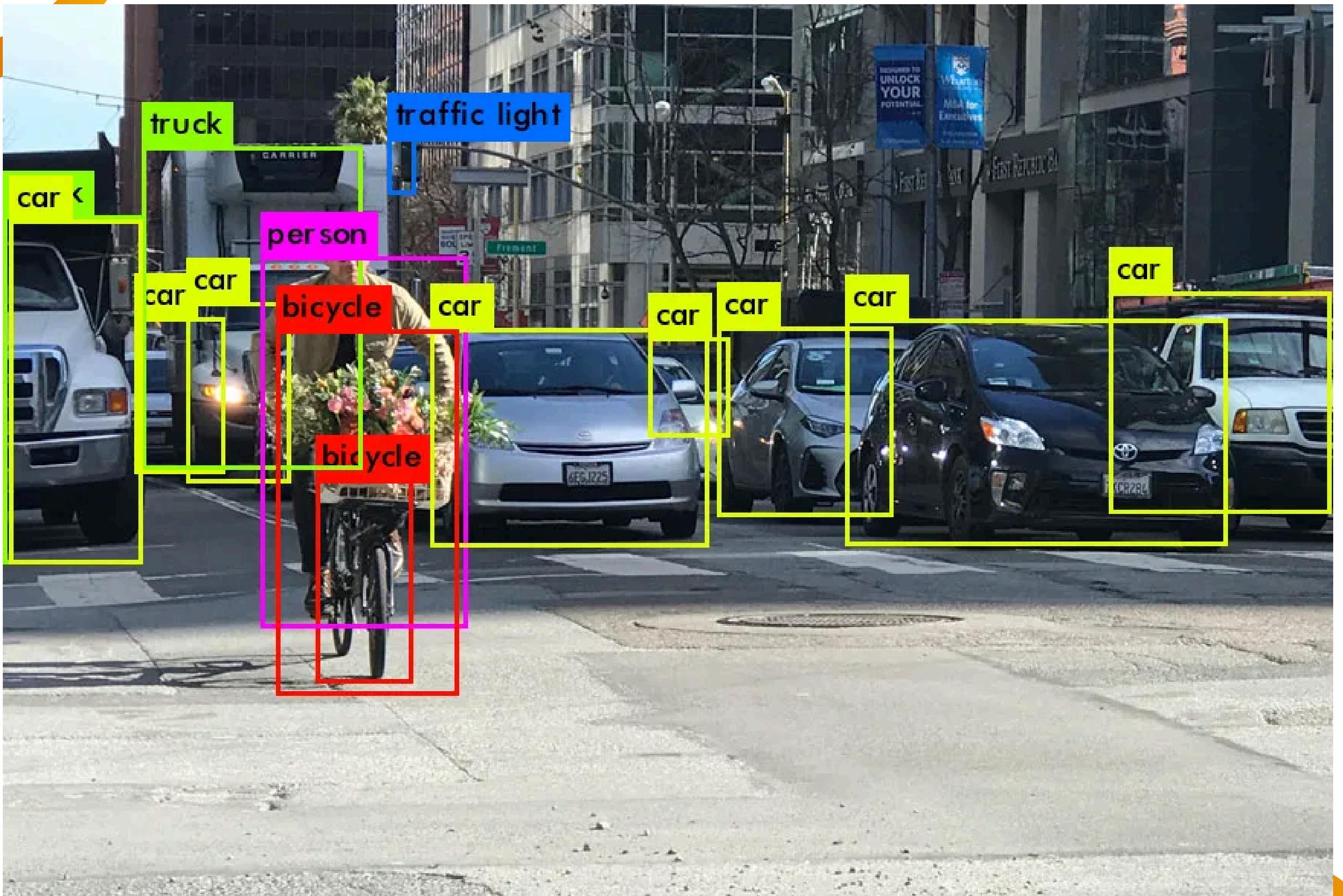
Uses Coco Format

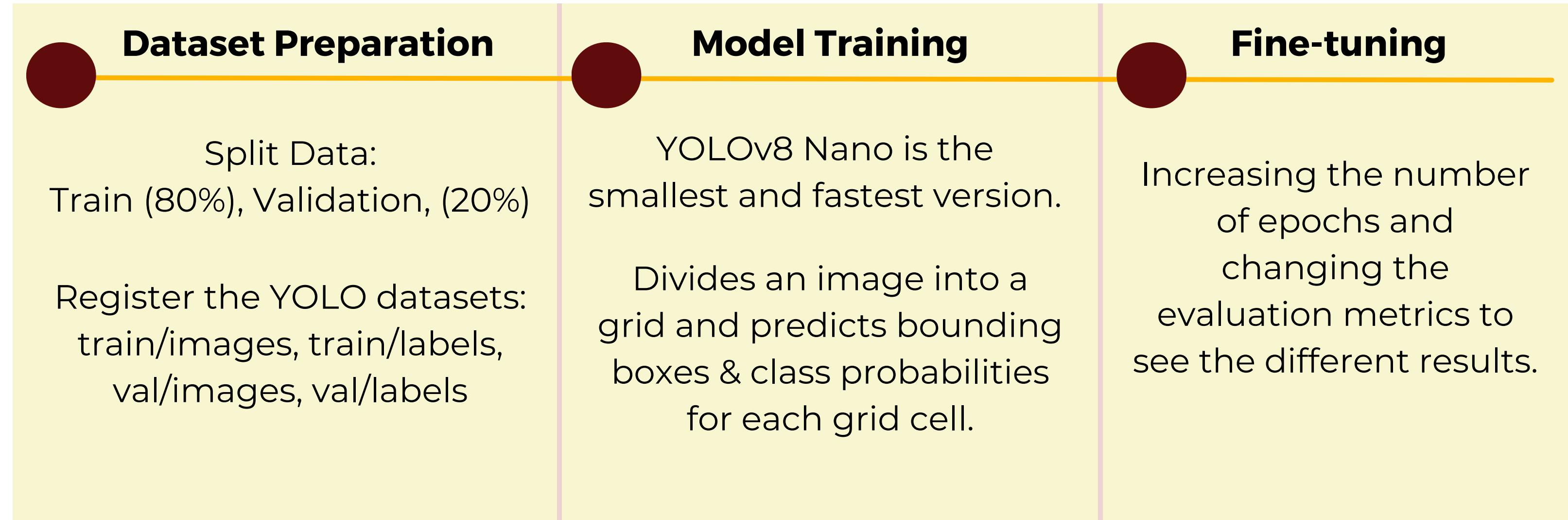
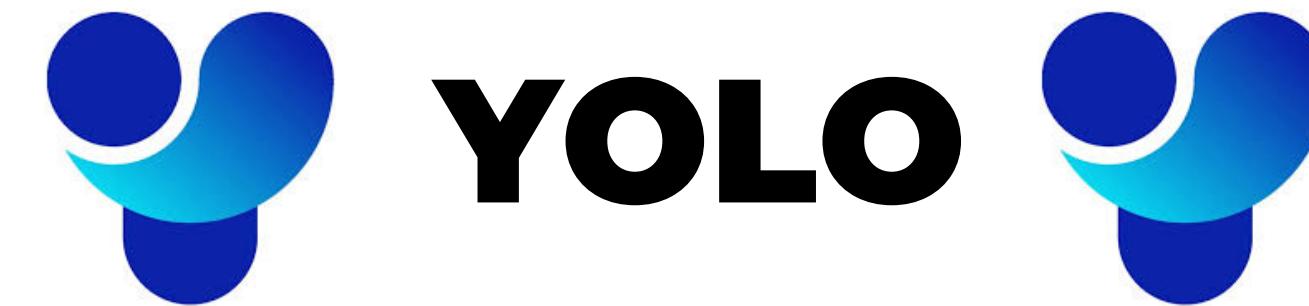
```
[  
    {  
        "file_name": "chicago_108.pdf_2.jpg",  
        "width": 1707,  
        "height": 2200,  
        "bbox": [  
            160,  
            1363,  
            507,  
            1465  
        ]  
    },
```



- You only look once (YOLO) is a real-time object detection model.
- Created by Ultralytics.
- YOLO applies a single neural network to the given image and classifies it in one pass, making it extremely fast.

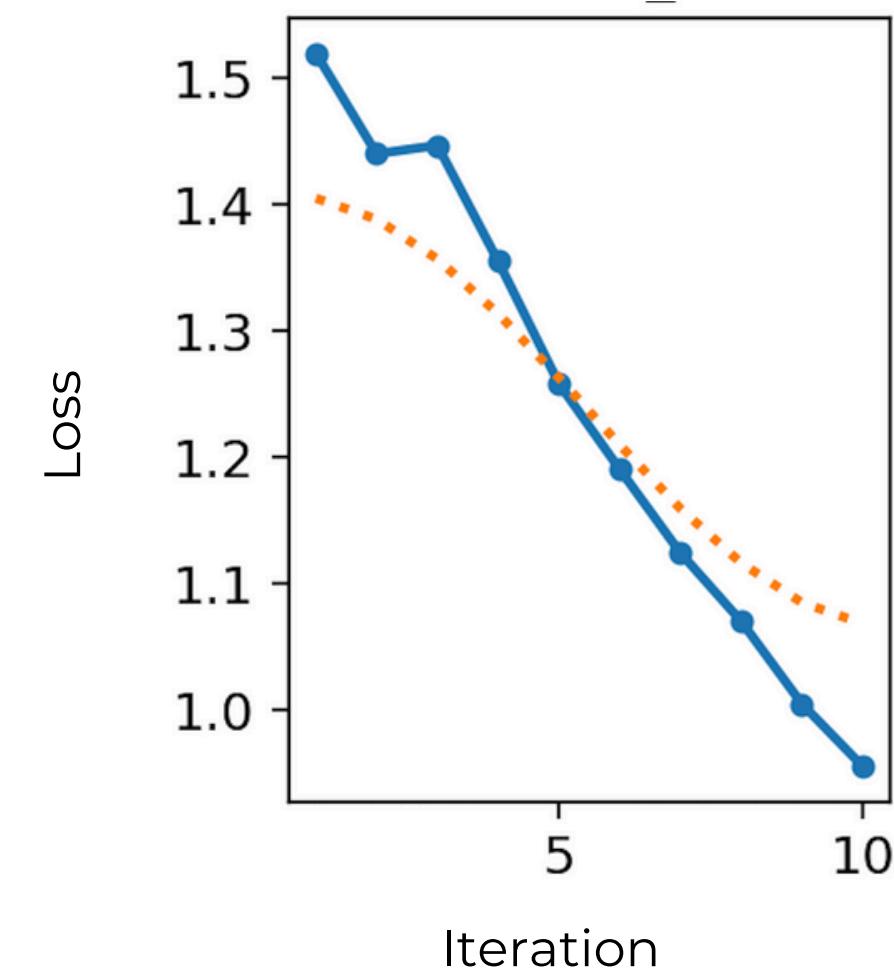




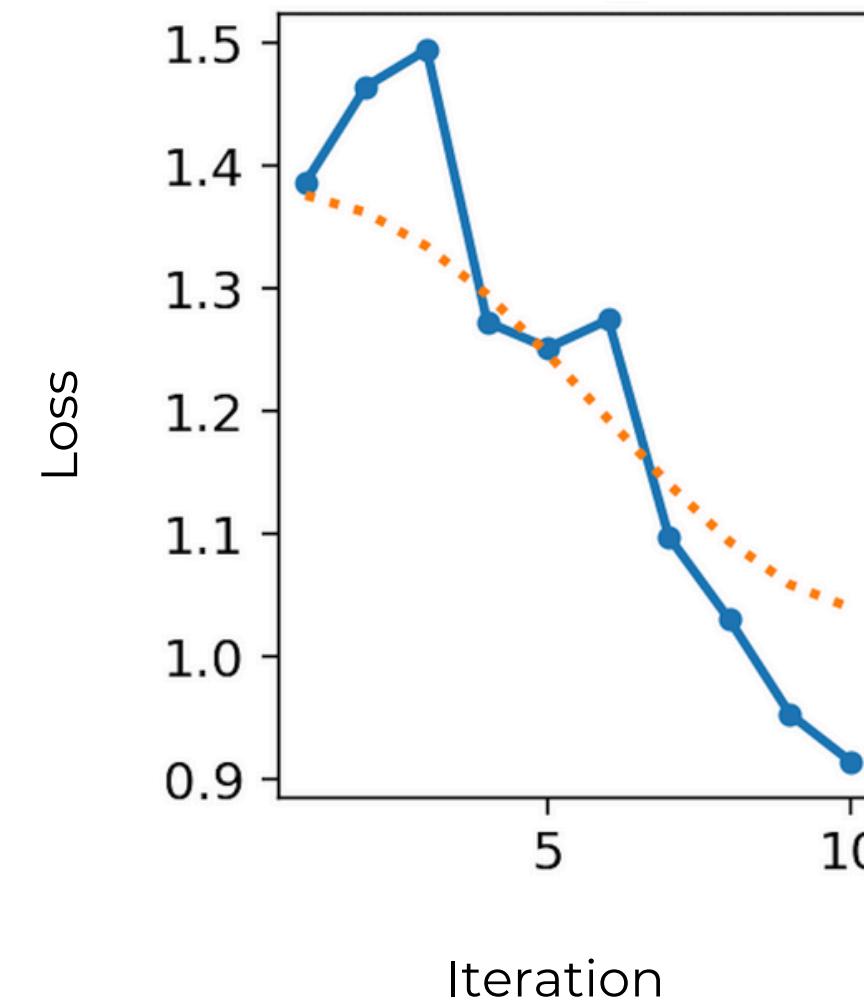


# Final Metrics YOLO

Training Loss



Validation Loss



**ACORD CERTIFICATE OF LIABILITY INSURANCE**

INSURER: The ROCKWOOD Company  
Mort Finkel  
20 N Wacker Drive, Suite #960  
Chicago, IL 60606-2901

312-621-2472

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERNS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

DATE (MM/DD/YY)  
11/19/02**INSURERS AFFORDING COVERAGE**

SUBSIDY: North Avenue Day Nursery  
2001 W. Pierce Avenue  
Chicago IL 60622

INSURER A: Capitol Indemnity  
INSURER B: St Paul Fire & Marine  
INSURER C:  
INSURER D:  
INSURER E:

**OVERAGES**

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
GENERAL LIABILITY	BP00155926	6/30/02	6/30/03	EACH OCCURRENCE \$ 1000000 FIRE DAMAGE (Any one fire) \$ 100000 MED EXP (Any one person) \$ 5000 PERSONAL & ADV INJURY \$ GENERAL AGGREGATE \$ PRODUCTS - COMP/OP AGG \$
X COMMERCIAL GENERAL LIABILITY <input checked="" type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> CCUR				
GENL AGGREGATE LIMIT APPLIES PER:				
POLICY <input type="checkbox"/> PRO <input checked="" type="checkbox"/> INT <input type="checkbox"/> LCC				
AUTOMOBILE LIABILITY	BP00155925	6/30/02	6/30/03	COMBINED SINGLE LIMIT (per accident) \$  BODILY INJURY (per person) \$  BODILY INJURY (per accident) \$  PROPERTY DAMAGE (per accident) \$  AUTO ONLY - EA ACCIDENT \$  OTHER THAN AUTO ONLY - EA ACC \$ AGG \$
ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHDU ED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON OWNED AUTOS <input type="checkbox"/>				
GARAGE LIABILITY				AUTO ONLY - EA ACCIDENT \$  OTHER THAN AUTO ONLY - EA ACC \$ AGG \$
ANY AUTO <input type="checkbox"/>				
EXCESS LIABILITY				EACH OCCURRENCE \$ AGGREGATE \$ \$ \$ \$
<input type="checkbox"/> CCUR <input type="checkbox"/> CLAIMS MADE				
REDUCTIBLE <input type="checkbox"/> RETENTION \$				
WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	WC00155925	6/30/02	6/30/03	X WC STATUS TOKY LIMITS TOT E.L. EACH ACCIDENT \$ *XXXXX* E.L. DISEASE - EA EMPLOYEE \$ 100000 E.L. DISEASE - POLICY LIMIT \$ 500000
OTHER	ND00001753	6/30/02	6/30/03	\$1,000,000 each claim \$1,000,000 aggregate
Directors & Officers	\$1,000 Ded.			

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS

**CERTIFICATE HOLDER****ADDITIONAL INSURED: INSURER LETTER:****CANCELLATION**

City of Chicago/Compt Office  
Federal Funds Ins Unit  
33 N. LaSalle St., Room 800  
Chicago, IL 60602

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 30 DAYS WRITTE NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO VENIAL PENALTY UPON THE ISSUING INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED SIGNATURE  
*Maechele* **signature 0.69**

CORD 25-S (7/97)

26 13

© ACORD CORPORATION 1986

**CHICAGO DEPARTMENT OF HUMAN SERVICES  
HEAD START/ COLLABORATION / EARLY HEAD START  
PROGRAM ASSURANCES**

The undersigned hereby assures and certifies that the Contractor / Delegate Agency will comply with all regulations, policies, guidelines, and requirements as they relate to the application, acceptance and use of funds for this project. The undersigned further certifies and assures that the Contractor / Delegate Agency will comply with the specifics of the following, as applicable to the Head Start Program Performance Standards and other U. S. Department of Health & Human Services regulations:

1. Scope of Services ✓
2. Program Information Summary ✓
3. Project Recruitment Area ✓
4. Program Certifications ✓
5. Bonding Verification ✓
6. Drug Free Workplace Certification ✓
7. Child Abuse and Neglect Certification ✓
8. Policy Committee Approval ✓
9. Parent Activity Budget ✓
10. Head Start or Early Head Start Training Plans ✓
11. Monitoring and Evaluation Procedures
12. Program Approach Form ✓

North Avenue Day Nursery  
Contractor / Delegate Agency

**signature 0.63**

*Steven Koll*

Signature of Administrator / Executive Director

Steven Koll Executive Director 8/2/02  
Typed Name and Title Date

CDHS, CSD, in house approval signature(s) *I-D* Date 3-20-02

UNTITLED-043

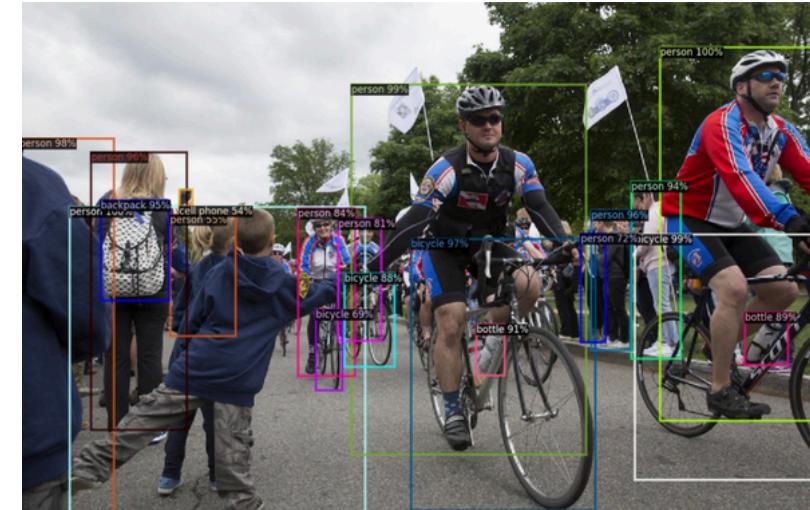


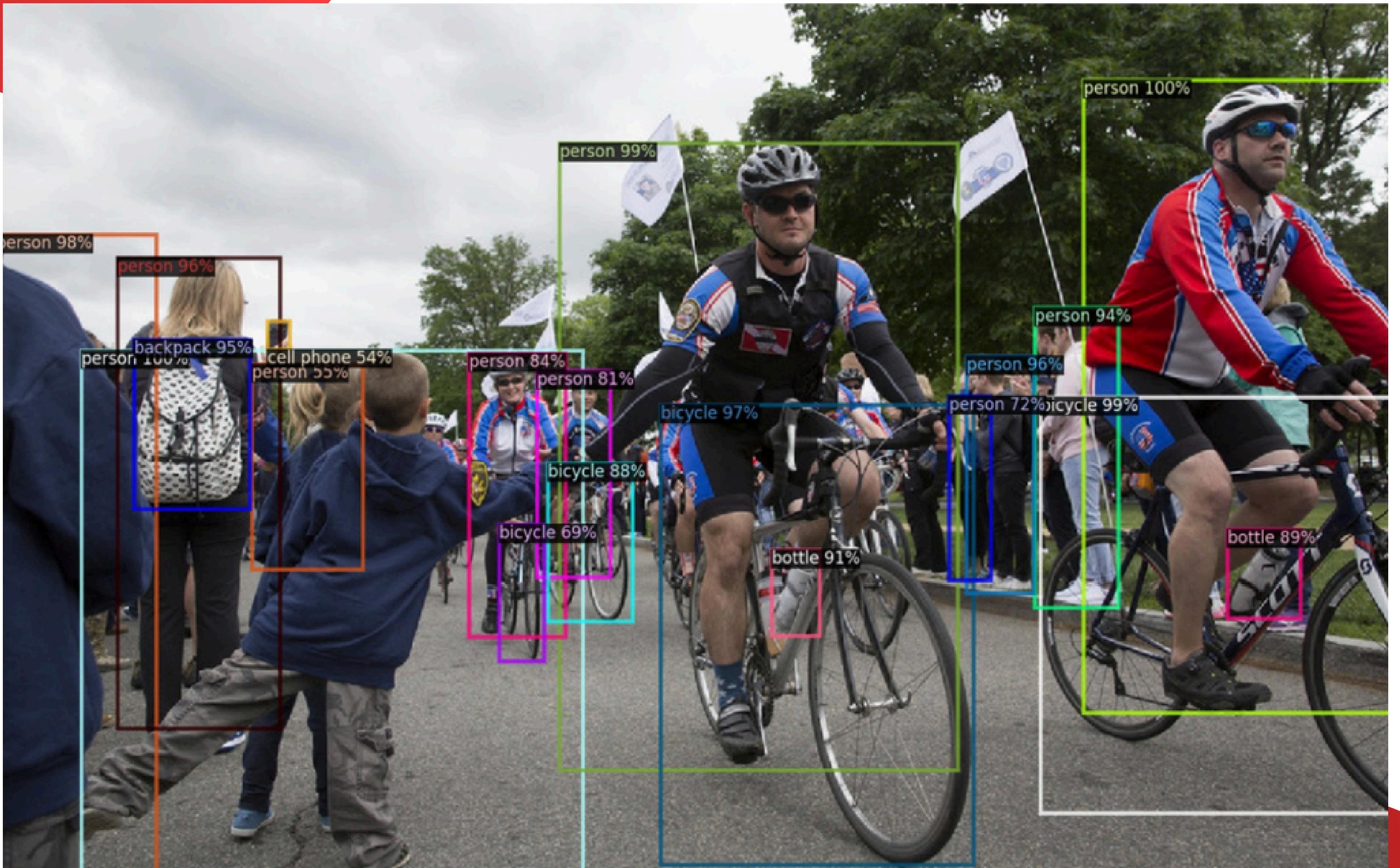
UNTITLED-065



# Detectron2

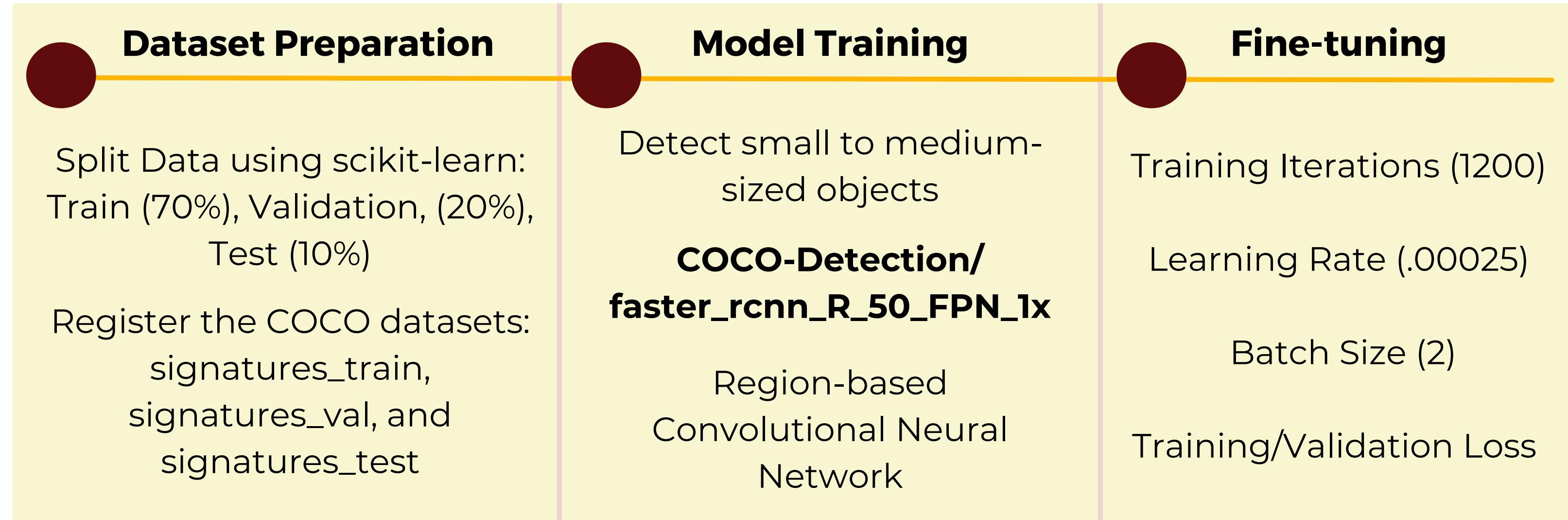
- Detectron2 is a deep learning framework that allows users to perform object detection, segmentation, and other computer vision tasks.
- Created by the FAIR (Facebook AI Research group).
- Though Yolov8 is faster, Detectron2 is known for its high accuracy.







# Training Detectron2

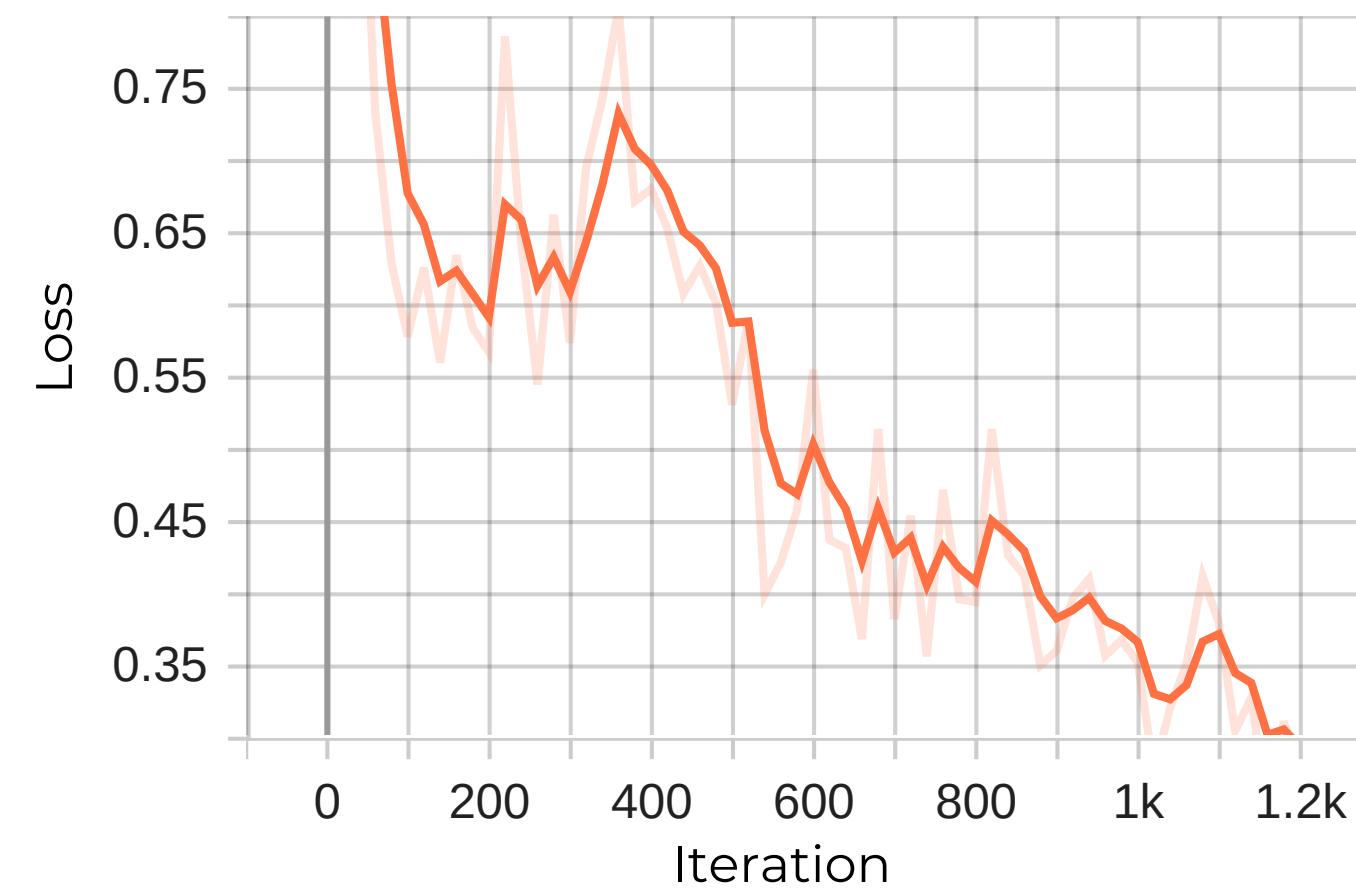




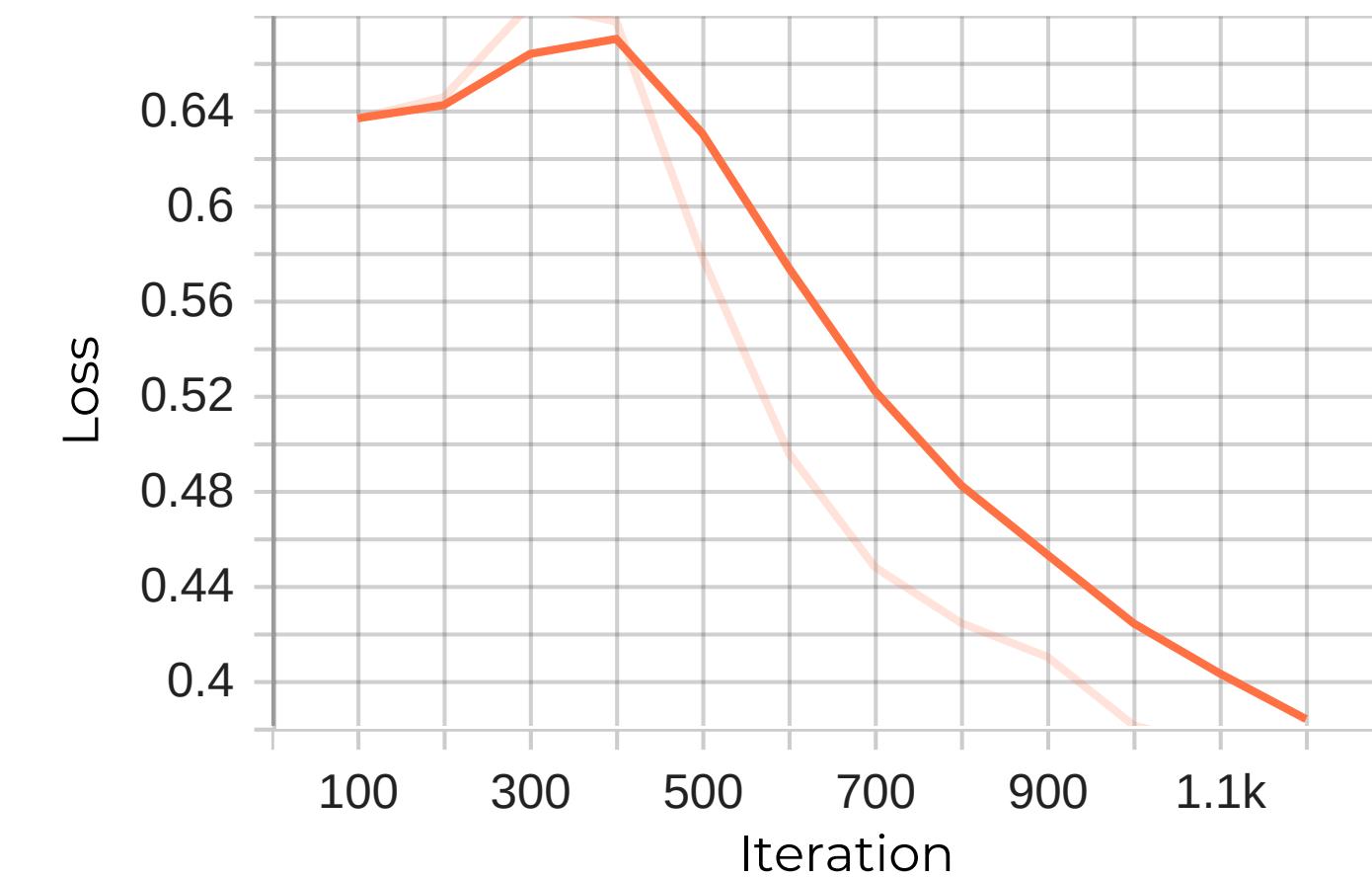
# Final Metrics Detectron2



Training Loss



Validation Loss



AP	AP50	AP75	APs	APm	APl
:	:	:	:	:	:
56.930	81.930	67.314	nan	46.183	57.570

Your Name

Any Street, Any Town  
Tel: (000) 999-9999

PAY TO THE  
ORDER OF Thirty-five thousand



BANK  
Any Street, Any Town  
Tel: (000) 777-7777

MEMO \_\_\_\_\_

•001 0004 004 7845 899



0009

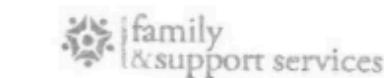
Date 03/06/2002

\$ 300

Dollars

SECURITY CODE  
EMBEDDED

signature 99%  
 SIGNATURE



City of Chicago

Budget Form

Budget Summary



FORM 1

A. Delegate Agency:	A Safe Haven Foundation	F. Supplier / Site #	50074290 B
B. Program Name:	Positive Power Youth Mentoring Program	G. PO #:	44211
C. Department:	Family and Support Services	H. Release #:	3
D. Contract Term:	1/1/2018-12/31/2018	I. Funding Strip:	018-0100-502003-9260-0135
E. 2018 Allocation:	\$45,000	J. CFDA #:	N/A
Preparer Name	Patricia Austin	Preparer Phone Number	312-372-6707 ext 125
		Preparer E-mail address	patricia@asafehaven.com

K. Program Budget Summary for Year: 2018

Note: The entire budget for this program must be shown.

(1) Item of Expenditure	(2) Account #	(3) Grant Award Share	(4) Other Share	(5) Total Cost
Personnel (salaries, stipends, overtime, salary adjustments)	0005	\$3,678	\$8,220	\$11,898
Fringe Benefits (FICA, unemployment, workers Comp)	0044	\$1,097	\$2,366	\$3,463
Operating/Technical (auditing, legal, publications, rental of property/equipment/services, repair/maintenance of equipment, insurance, utilities, telephone/cell, postage, advertising, technical meeting costs)	0100	\$95	\$115	\$210
Professional and Technical Services (consultants)	0140	\$34,875	\$0	\$34,875
Travel (transportation, hotel, meals, gratuities, and parking cost)	0200	\$1,000	\$0	\$1,000
Materials and Supplies (stationery, tools, basic office supplies, food, and fuel)	0300	\$1,255	\$0	\$1,255
Equipment (tools, office machines, vehicles, costing \$5,000.00 or more)	0400	\$0	\$0	\$0
Indirect Cost	0801	\$0	\$0	\$0
Other: ADMISSIONS	0999	\$3,000	\$0	\$3,000
Other: 0	0999	\$0	\$0	\$0
TOTALS		\$45,000	\$10,701	\$55,701

\*\*ALL COLLECTED FEE BALANCE\*\*\*

signature 99% 19%

N. City Authorization

1-18-18

Signature of Department / Date

Walter L. Brown, Jr.

Name(Type or Print)

L. Percentage of total project costs paid by Other Share:

M. Delegate Authorization

signature 96% 1/11/13

Signature of Delegate Official / Date

Barbara Gorczyca

Name(Type or Print)

Controller

Title (Type or Print)

Revised FSS - 12/2014

Supervisor of Accounting

Title (Type or Print)

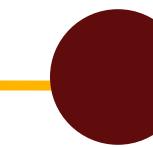
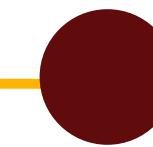
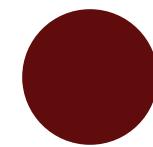
# Model Comparison

	<b>YOLO</b>	<b>Detectron2</b>
MAP Score	AP50: 67.1	AP50: 81.93
Inference Time	202.69 ms	189.81 ms
Model Size	6.2 MB	314 MB

# Demo!

Streamlit  
Application

# Challenges



## Data Preprocessing

- Figuring out first steps
- combining .xml and .json
- formatting the bounding boxes

## Detectron2

- Not downloadable on Windows
- Some images were flipped or had the wrong dimensions

## YoloV8

- The training process used up to 6.2 GB of GPU memory



**Thank You!**