Project: Object Identification use case using YOLO

Name: Paavan Siri Vardhan Narava

company: MKS VISION PRIVATE LIMITED

Weekly Progress Report – Week 1 (24th June – 30th June)

During this week I learned how to implementing **Git** effectively through **VS Code**. Here are the concepts and commands I've practiced:

- **Basic Git Workflow**:
  - Git Initialization
  - Git Status Overview
  - Git Clone
  - Git Commit
  - Git Push / Git Pull
  - Undo Commands (reset, revert, etc.)
- **Remote Repository Handling**:
  - Connecting to GitHub via VS Code
  - Push to and Pull from Remote Repositories
  - Creating and Submitting Pull Requests
- **Branch Management**:
  - Creating Branches
  - Merging Branches
  - Renaming and Deleting Branches
  - Publishing Branches to Remote
- **Stash Management**:

    - Using git stash to temporarily save changes
    - Dropping Stashes
- **VS Code Integration**:
    - Using the Source Control tab for visual commits, staging, and branching
    - Resolving basic merge conflicts inside VS Code

Weekly Progress Report – Week 2 (1st July – 6th July)

YOLO Object Detection – Introduction and Practice

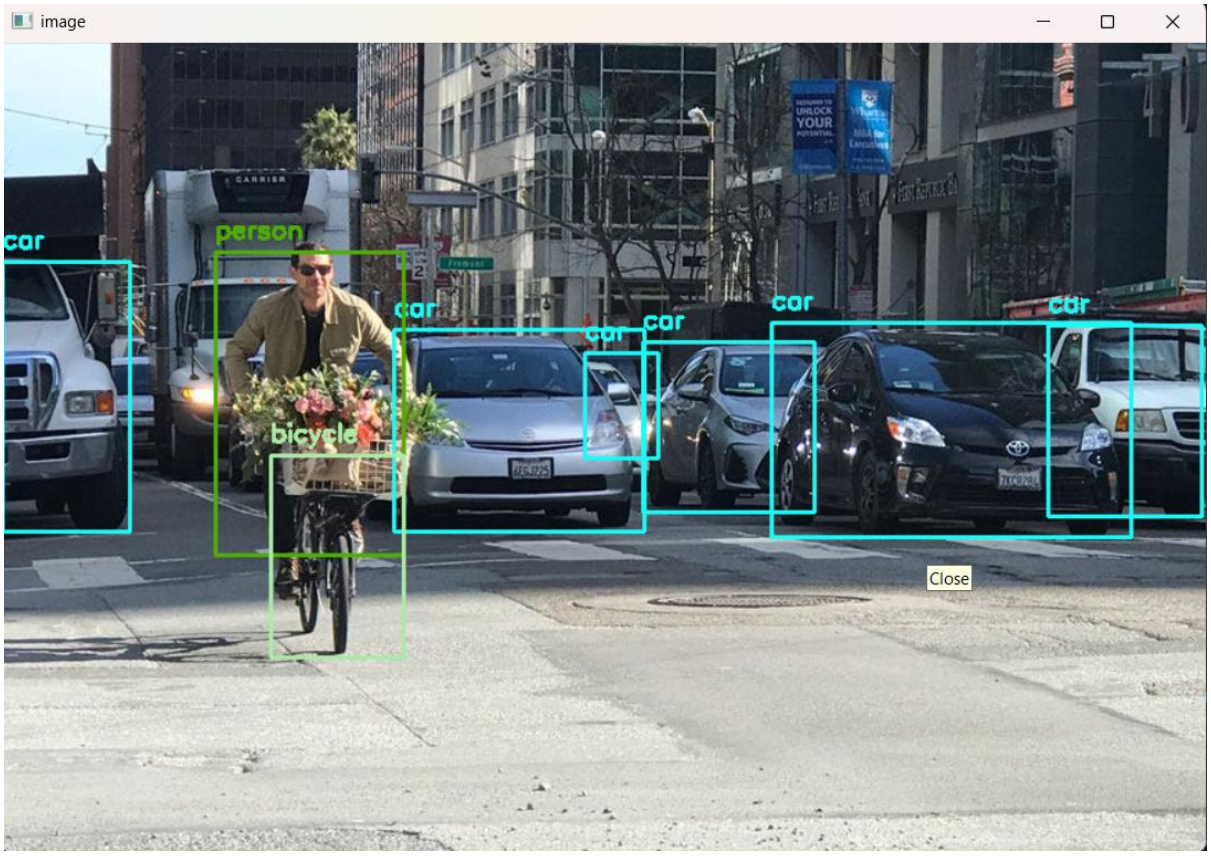
- Studied the basic working of **YOLO (You Only Look Once)** model for object detection.
- Understood how YOLO processes image, detects objects, and draws bounding boxes in a single forward pass.
- Learned how to use pre-trained YOLO models for object detection tasks using Python.

Hands-On Practice

- Implemented a small **YOLO-based object detection script** using OpenCV and pretrained weights.
- Successfully ran detections on test images and verified output with bounding boxes and labels.
- **Pushed the code to GitHub** project link

Input:

Result:



Weekly Progress Report – Week 3 (7th July – 13th July)

PDF to Image Conversion

- Implemented code to convert each page of a PDF into high-resolution images using libraries such as **fitz** (PyMuPDF).
- Ensured proper handling of multi-page PDFs for full document coverage.

YOLOv8n Integration

- Imported and utilized a pre-trained **YOLOv8n** model for object detection.
- Trained the YOLOv8n model the dataset was used from the roboflow website.
- Applied the custom trained model on the pdf which were converted into images.

Object Detection Output

- **Successfully detected and highlighted:**
    - **Text blocks**
    - **Tables**
    - **Embedded images**

Steps how to model our custom data:

Step 1: Give the pdf to the function convert that to the images

Step 2: Store them and the used those test images to train the model, (store the address in the .yaml extension)

Step 3: Now use the trained model to predict the results

Result 1:

Integrity and transparency & Relationship with stakeholders

text 0.25

Our Company upholds integrity and transparency in all transactions and communications with stakeholders. Our stakeholders are our partners in our journey to sustained value creation and therefore, our relationship with stakeholders and clear communication with them is at the center of all disclosures and reports.

text 0.97

Corporate

Infosys was incorporated in Pune, in 1981, as Infosys Consultants Private Limited, a private limited company under the Companies Act, 1956. In 1983, the corporate headquarters were relocated to Bengaluru. The name of the Company was changed to Infosys Technologies Private Limited in April 1992 and to Infosys Technologies Limited in June 1992, when the Company became a public limited company. We made an Initial Public Offering (IPO) in February 1993 and were listed on stock exchanges in India in June 1993. Trading opened at ₹145 per share, compared to the IPO price of ₹95 per share. In October 1994, we made a private placement of 5,50,000 shares at ₹450 each to Foreign Institutional Investors (FIIs), Financial Institutions (FIs) and body corporates.

On March 11, 1999, Infosys listed on NASDAQ, becoming the first Indian company to do so. We issued 20,70,000 American Depositary Shares (ADSs) (equivalent to 10,35,000 equity shares of par value ₹10 each) at US$34 per ADS under the ADS Program, and these ADSs were listed on the NASDAQ National Market.

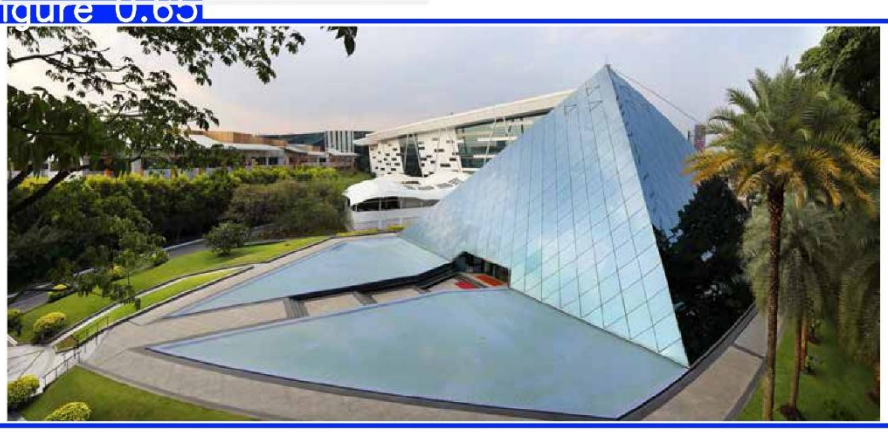
text 0.98

The share data mentioned before is unadjusted for stock split and bonus shares. In July 2003, June 2005 and November 2006, we issued secondary-sponsored American Depositary Receipts (ADRs) of US$294 million, US$1.1 billion and US$1.6 billion, respectively.

During fiscal 2012, the name of the Company was changed from Infosys Technologies Limited to Infosys Limited to mark the transition from being a technology services provider to a business transformation partner to our clients.

During fiscal 2013, we delisted our ADSs from NASDAQ, and listed them in the New York Stack Exchange (NYSE), Euronext London and Euronext Paris. During fiscal 2019, the Company voluntarily delisted from Euronext London and Paris due to low trading volume. Infosys equity shares and ADSs are listed on NSE and BSE in India and in NYSE, respectively, under the symbol "INFY".

figure 0.85



Result 2:

table 0.35

3(b) Information as per Rule 5 of Chapter XIII, the Companies (Appointment and Remuneration of Managerial Personnel) Rules, 2014

Top 10 employees in terms of remuneration drawn during the year

Employee name	Designation	Educational qualification	Age	Experience (in years)	Date of joining	Location	Remuneration in fiscal 2025 (in ₹) [1]	No. of RSUs granted in fiscal 2025 [2]	Previous employment and designation
Salil Parekh	CEO & MD	B.Tech, ME	60	37	Jan 2, 2018	India	80,62,36,456[3]	3,82,071	Capgemini, Director General
Karmesh Gul Vaswani	Segment Head – CPG, Logistics & Retail	BE	53	32	Mar 3, 2003	UK	21,64,37,027[4]	62,980	Accenture, Senior Manager
Inderpreet Sawhney	Chief Legal Officer and Chief Compliance Officer	BA LLB, LLM	60	34	Jul 3, 2017	US	20,09,01,326[5]	60,240	Wipro, Senior Vice President and General Counsel
Martha King	Chief Client Officer	BS	61	40	Oct 12, 2020	US	16,08,78,772[6]	46,130	Vanguard, Managing Director
Jasmeet Singh	Segment Head – Manufacturing	B.Tech, MBA	53	29	May 31, 2011	US	14,88,98,433[7]	53,320	HCL America, Vice President
Anand Swaminathan	Segment Head – Communication, Media and Technology	ACS, AICWA, MS	53	33	Apr 26, 1999	US	14,46,55,601[8]	53,320	Rane Brake Linings Limited, Manager Information Technology
Ashiss Kumar Dash	Segment Head – Energy, Utilities, Resources and Services	B.Tech (H)	53	31	May 8, 1995	US	12,71,82,708[9]	55,300	Indal, Process Engineer
Anant Raghavendra Adya	Service Offering Head	B.Sc	52	30	Nov 10, 2008	US	12,20,54,412[10]	28,880	Wipro, Project Manager
Gavin Sheldon	Head – Entertainment and Connectivity Platforms	Diploma A Level	49	30	Nov 6, 2023	UK	11,36,49,276[11]	11,320	Liberty Global, Managing Director
Upendra Kohli	Industry Head – Communications, Media and Technology	BE, MBA	55	32	Jan 2, 2019	US	10,73,36,286[12]	26,610	Telstra, Managing Director

Notes: The details in the above table are on accrual basis for better comparability with the KMP remuneration disclosures included in other sections of this Annual Report.

The aforementioned employees have / had permanent employment contracts with the Company.

Employees mentioned above are neither relatives of any directors of the Company, nor hold 2% or more of the paid-up equity share capital of the Company as per Clause (iii) of sub-rule (2) of Rule 5 of the Companies (Appointment and Remuneration of Managerial Personnel) Rules, 2014.

For employees based overseas, average exchange rates have been used for conversion to INR.

(1) Includes fixed pay, variable pay, retiral benefits and the perquisite value of stock incentives exercised during the period, determined in accordance with the provisions of the Income-tax Act, 1961 or ons as applicable. Accordingly, the value of stock incentives granted during the period is not included. The number of stock incentives granted in fiscal 2025 is included in the

text 0.89

(2) Includes equity-settled and cash-settled RSUs issued at par under the 2015 and 2019 Plans.

(3) Remuneration includes ₹49.50 crore on account of exercise of 3,06,276 RSUs under the 2015 Plan and 39,141 RSUs under the 2019 Plan during fiscal 2025

(4) Remuneration includes ₹10.22 crore on account of exercise of 47,850 RSUs under the 2015 Plan and 13,662 RSUs under the 2019 Plan during fiscal 2025.

(5) Remuneration includes ₹10.04 crore on account of exercise of 47,386 RSUs under the 2015 Plan and 14,499 RSUs under the 2019 Plan during fiscal 2025.

(6) Remuneration includes ₹6.97 crore on account of exercise of 28,267 RSUs under the 2015 Plan and 12,789 RSUs under the 2019 Plan during fiscal 2025. S e has resigned from the Company and her last working day was March 21, 2025.

(7) Remuneration includes ₹7.61 crore on account of exercise of 35,506 RSUs under the 2015 Plan and 11,086 RSUs under the 2019 Plan during fiscal 2025.

(8) Remuneration includes ₹7.18 crore on account of exercise of 35,757 RSUs under the 2015 Plan and 10,753 RSUs under the 2019 Plan during fiscal 2025.

(9) Remuneration includes ₹6.50 crore on account of exercise of 23,957 RSUs under the 2015 Plan and 10,630 RSUs under the 2019 Plan during fiscal 2025.

(10) Remuneration includes ₹7.03 crore on account of exercise of 42,443 RSUs under the 2015 Plan and 8,418 RSUs under the 2019 Plan during fiscal 2025.

(11) Remuneration includes ₹0.50 crore on account of exercise of 2,700 RSUs under the 2015 Plan during fiscal 2025.

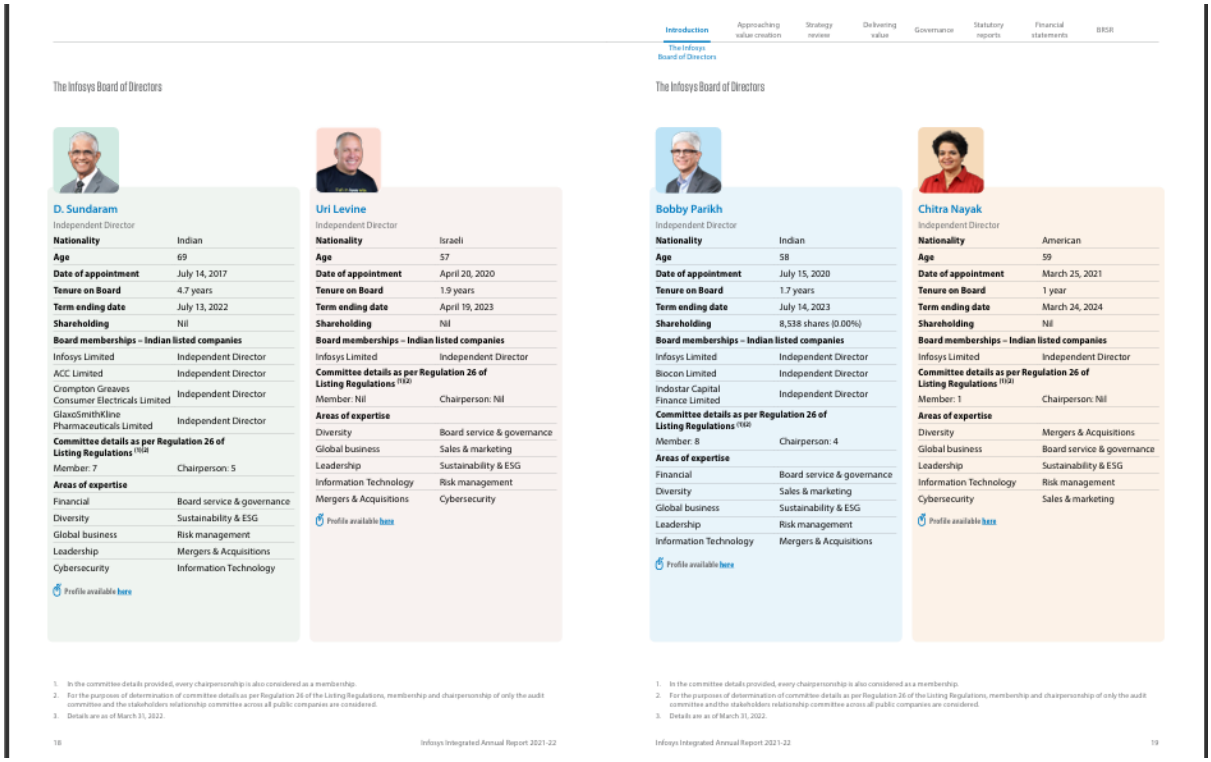
(12) Remuneration includes ₹3.96 crore on account of exercise of 15,008 RSUs under the 2015 Plan and 5,715 RSUs under the 2019 Plan during fiscal 2025.

Weekly Progress Report – Week 4 (14st July – 20th July)

Annotation Tool Development

- Implemented a **custom PDF image annotation tool** using **OpenCV GUI**.
- Features developed:
    - Mouse-driven bounding box drawing
    - Label input mode via keyboard
- Successfully used this tool to manually annotate additional pages evaluation.
- Stored annotations with format: (label, x1, y1, x2, y2) for model compatibility.

Step 1 (Image we want to annotate):



The Infosys Board of Directors

D. Sundaram
Independent Director

Nationality	Indian
Age	69
Date of appointment	July 14, 2017
Tenure on Board	4.7 years
Term ending date	July 13, 2022
Shareholding	Nil
Board memberships – Indian listed companies	
Infosys Limited	Independent Director
ACC Limited	Independent Director
Crompton Greaves Consumer Electricals Limited	Independent Director
GlaxoSmithKline Pharmaceuticals Limited	Independent Director
Committee details as per Regulation 26 of Listing Regulations [1][2]	
Member: 7	Chairperson: 5
Areas of expertise	
Financial	Board service & governance
Diversity	Sustainability & ESG
Global business	Risk management
Leadership	Mergers & Acquisitions
Cybersecurity	Information Technology

Profile available here

Uri Levine
Independent Director

Nationality	Israeli
Age	57
Date of appointment	April 20, 2020
Tenure on Board	1.9 years
Term ending date	April 19, 2023
Shareholding	Nil
Board memberships – Indian listed companies	
Infosys Limited	Independent Director
Committee details as per Regulation 26 of Listing Regulations [1][2]	
Member: Nil	Chairperson: Nil
Areas of expertise	
Diversity	Board service & governance
Global business	Sales & marketing
Leadership	Sustainability & ESG
Information Technology	Risk management
Mergers & Acquisitions	Cybersecurity

Profile available here

1. In the committee details provided, every chairpersonship is also considered as a membership.
2. For the purposes of determination of committee details as per Regulation 26 of the Listing Regulations, membership and chairpersonship of only the audit committee and the stakeholders relationship committee across all public companies are considered.
3. Details are as of March 31, 2022.

18 Infosys Integrated Annual Report 2021-22

Introduction | Approaching value creation | Strategy review | Delivering value | Governance | Statutory reports | Financial statements | BRSR
The Infosys Board of Directors

The Infosys Board of Directors

Bobby Parikh
Independent Director

Nationality	Indian
Age	58
Date of appointment	July 15, 2020
Tenure on Board	1.7 years
Term ending date	July 14, 2023
Shareholding	8,538 shares (0.00%)
Board memberships – Indian listed companies	
Infosys Limited	Independent Director
Biocon Limited	Independent Director
Indostar Capital Finance Limited	Independent Director
Committee details as per Regulation 26 of Listing Regulations [1][2]	
Member: 8	Chairperson: 4
Areas of expertise	
Financial	Board service & governance
Diversity	Sales & marketing
Global business	Sustainability & ESG
Leadership	Risk management
Information Technology	Mergers & Acquisitions

Profile available here

Chitra Nayak
Independent Director

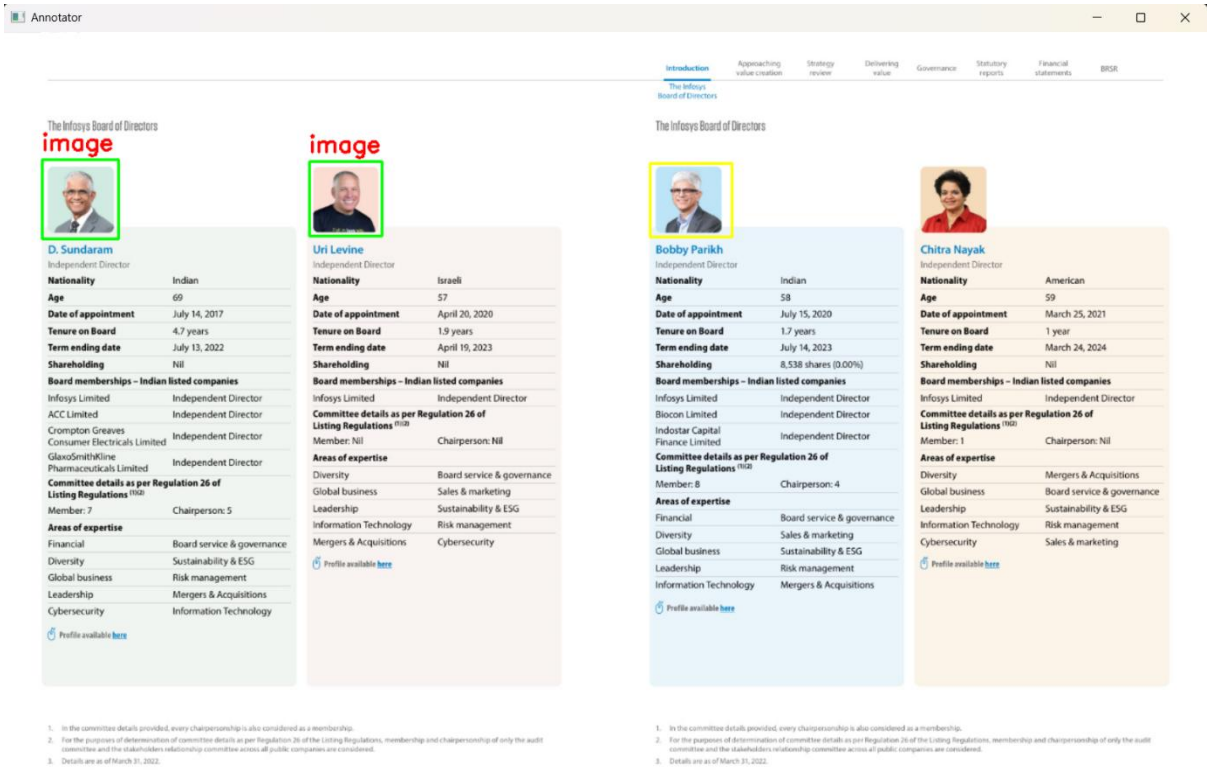
Nationality	American
Age	59
Date of appointment	March 25, 2021
Tenure on Board	1 year
Term ending date	March 24, 2024
Shareholding	Nil
Board memberships – Indian listed companies	
Infosys Limited	Independent Director
Committee details as per Regulation 26 of Listing Regulations [1][2]	
Member: 1	Chairperson: Nil
Areas of expertise	
Diversity	Mergers & Acquisitions
Global business	Board service & governance
Leadership	Sustainability & ESG
Information Technology	Risk management
Cybersecurity	Sales & marketing

Profile available here

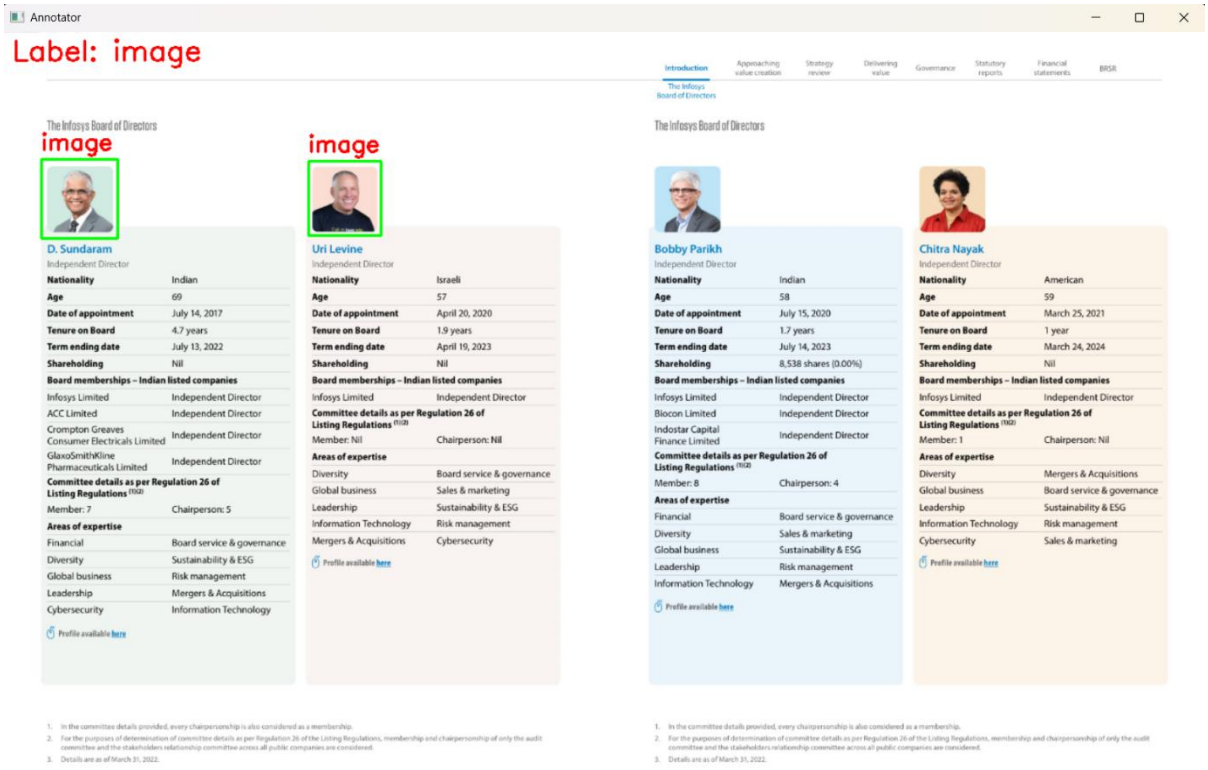
1. In the committee details provided, every chairpersonship is also considered as a membership.
2. For the purposes of determination of committee details as per Regulation 26 of the Listing Regulations, membership and chairpersonship of only the audit committee and the stakeholders relationship committee across all public companies are considered.
3. Details are as of March 31, 2022.

Infosys Integrated Annual Report 2021-22 19

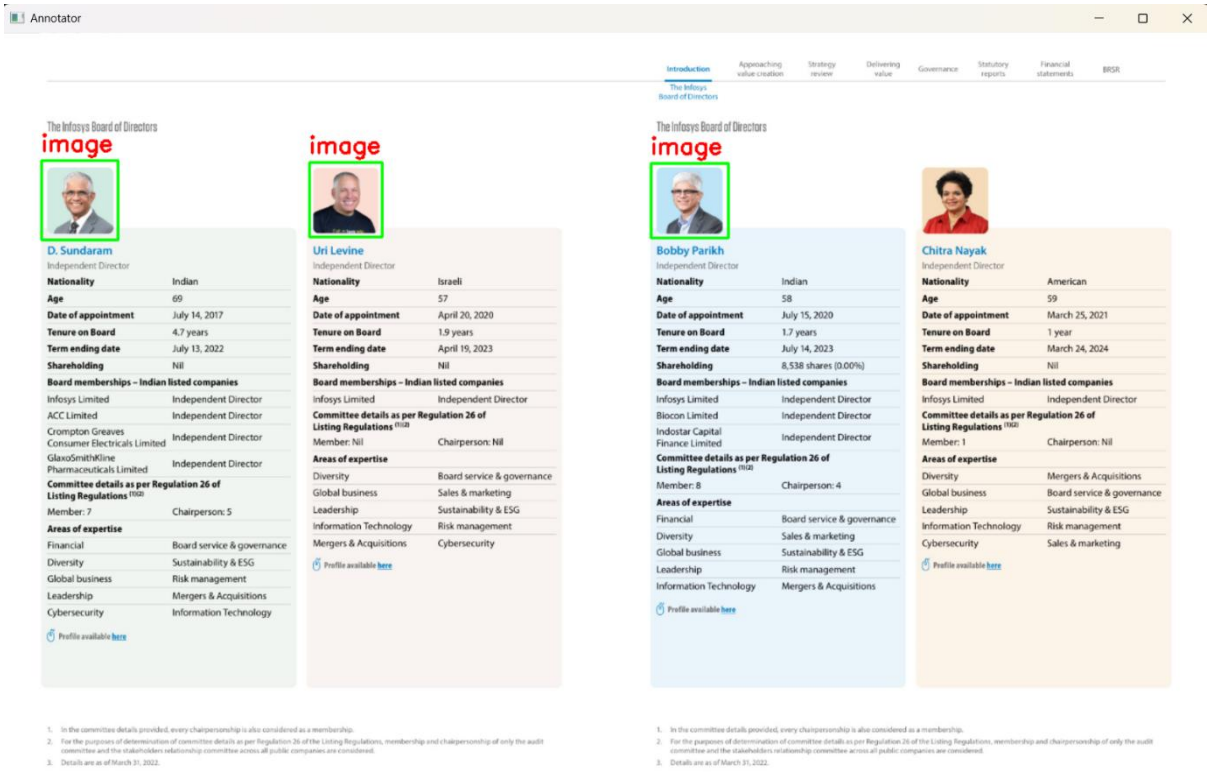
Step 2 (To label it, draw the yellow box using your mouse):



Step 3 (name the label):



Result (Label added):



Requirements:

opencv-python

ultralytics

PyMuPDF

PyYAML

Tech Stack

- Programming Language: Python
- Libraries: OpenCV, Ultralytics (YOLOv8), PyMuPDF, PyYAML
- Model: YOLOv8 (Nano)
- Interface: GUI (OpenCV-based)

Functional Modules

1. pdf2image.py

- Converts PDF pages to images using PyMuPDF.
- Handles dataset splitting into train, val, and test sets.

2. annotation.py

- GUI-based image annotator using OpenCV.
- Allows manual bounding box drawing and labeling.
- Saves annotations in YOLO format and generates data.yaml.

3. model.py

- Loads the YOLOv8-nano model and trains it on user-labeled data (which was done by the annotation.py).
- Saves the trained model to trained_model/custom_model/weigths/best.pt.

4. Object Detection.py

- Main driver script.
- Offers two modes:
    - Custom Dataset Creation & Training
    - Using Pretrained Model for Prediction
- Accepts PDFs from the testing_data/ folder.
- Outputs prediction images stored in results/.

Workflow

➤ If creating a custom dataset:

1. Add PDFs in code.
2. Define pages list for train/val/test split (optional).
3. Run Object Detection.py it triggers:
    - pdf2image.split_data()
    - annotation.main()
    - model.load_train_the_model(epoch)

➤ If using a pretrained model:

1. Place test PDF in testing_data/
2. Run Object Detection.py.
3. Predictions saved in results/

➤ **If creating a custom dataset suggestion:**

Training Notes

- Suggested Epochs (based on RAM):
  - 2 GB: 10–15 epochs
  - 4 GB: 20–35 epochs
  - 8 GB: 30–50 epochs
  - 16 GB+: >75 epochs
- Input image size: 640x640
- Label format: YOLO (class_id, x_center, y_center, width, height)

Future Enhancements

- Integrate FastAPI for web interface
- Add support for other file formats (e.g., Word, Excel)
- Enhance auto-labeling with weak supervision or active learning