MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT & ENGINEERING

In Plant Training At Jio Platforms
A.Y. 2022-2023
Semester: VIII

Presented by : Vansh Shah, C093

Organization Name : Jio Platforms Limited. (JPL)

Industry Mentor : Aditya Chauhan

Faculty Mentor : Prashasti Kanikar

Under the guidance of : Amit Dube

Flow of Presentation

- About the Organization
- About the Department
- About the Projects
- Description of technical tasks
- Brief of new skills gained
- Overall learnings
- Comments and Future Plan

Jio Platforms Limited

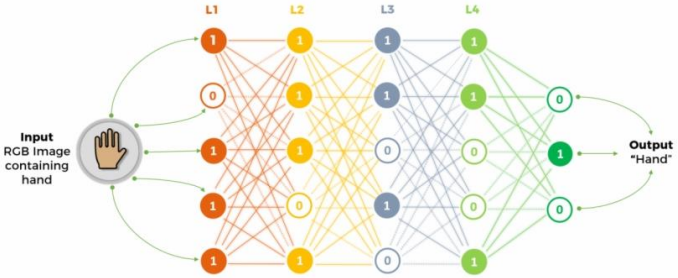
- Jio Platforms Limited is a leading Indian telecommunications company that provides a wide range of digital products and services.
- Services include:
  - End to End 5G and cloud solutions.
  - Digital Services.

Jio Platforms Limited

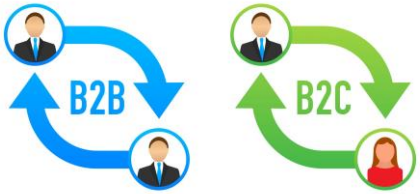
Services offered by JPL

About The Department

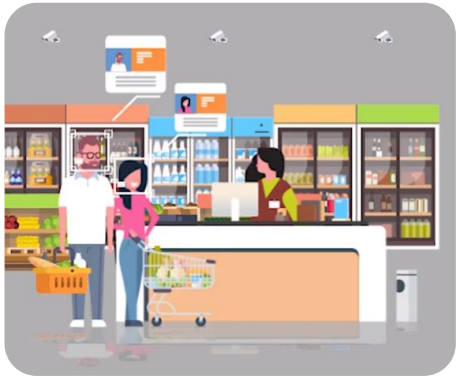
Special Initiatives AI/ML



Developing Cutting Edge Products using AI/ML/DL



Offering Products and Services

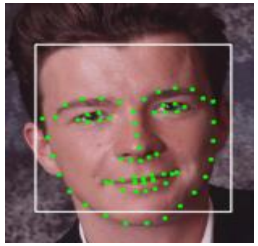


Incorporating Latest Technologies

About The Projects

1 – Registration Quality Segregator (RQS)

Registration Image

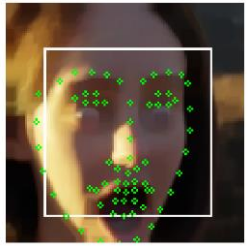


Detailed Features Extracted

>= 90%

Recognition Confidence

Registration Image



Inaccurate Feature Extraction

< 50%

Recognition Confidence

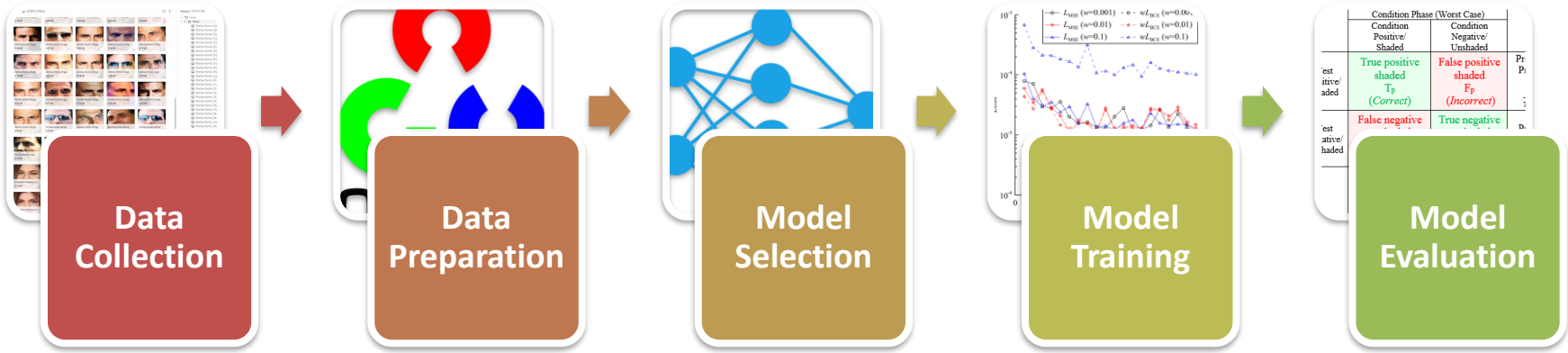
- Increased False Positives
- Increased False Negatives

Goal

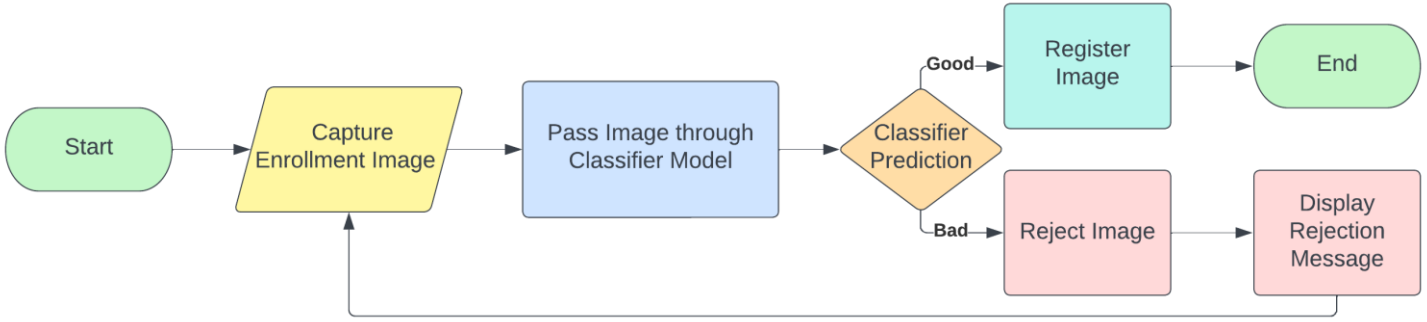
- ❑ Develop a deep learning classification model
- ❑ Discard bad quality enrollment images

Registration Quality Segregator (RQS) contd.

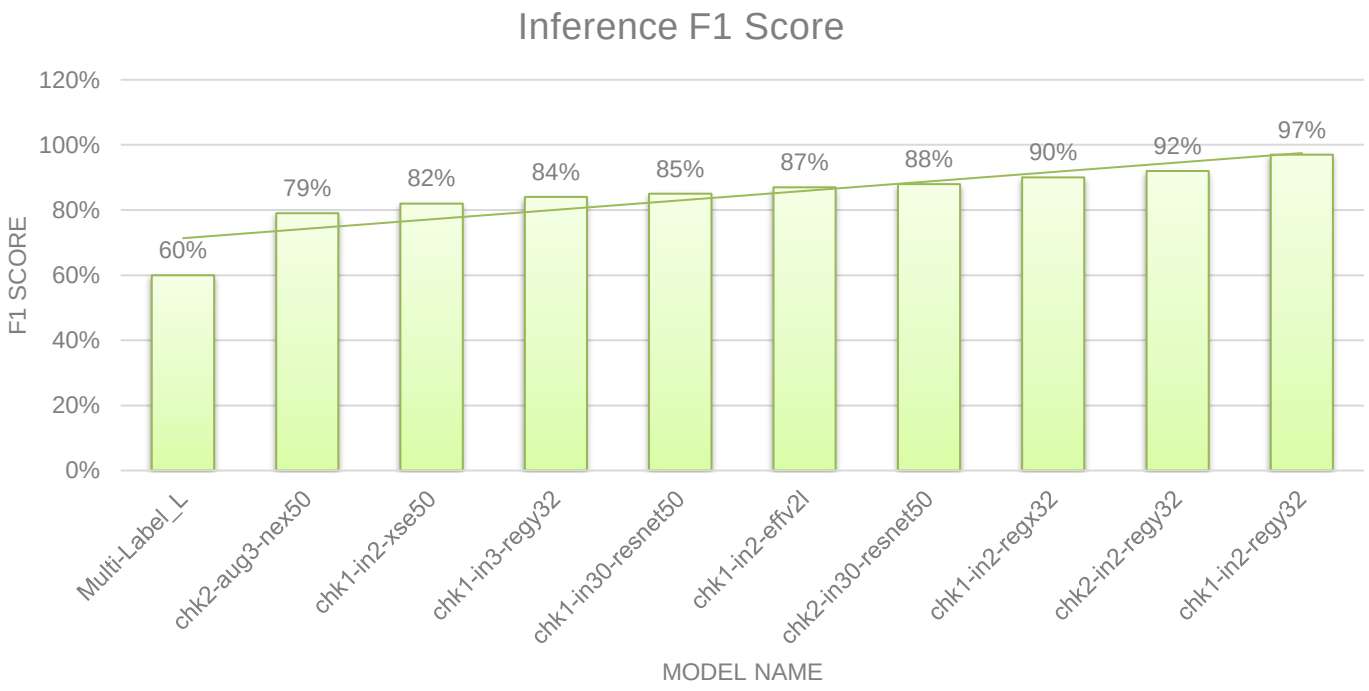
Process Pipeline



RQS Flow Diagram

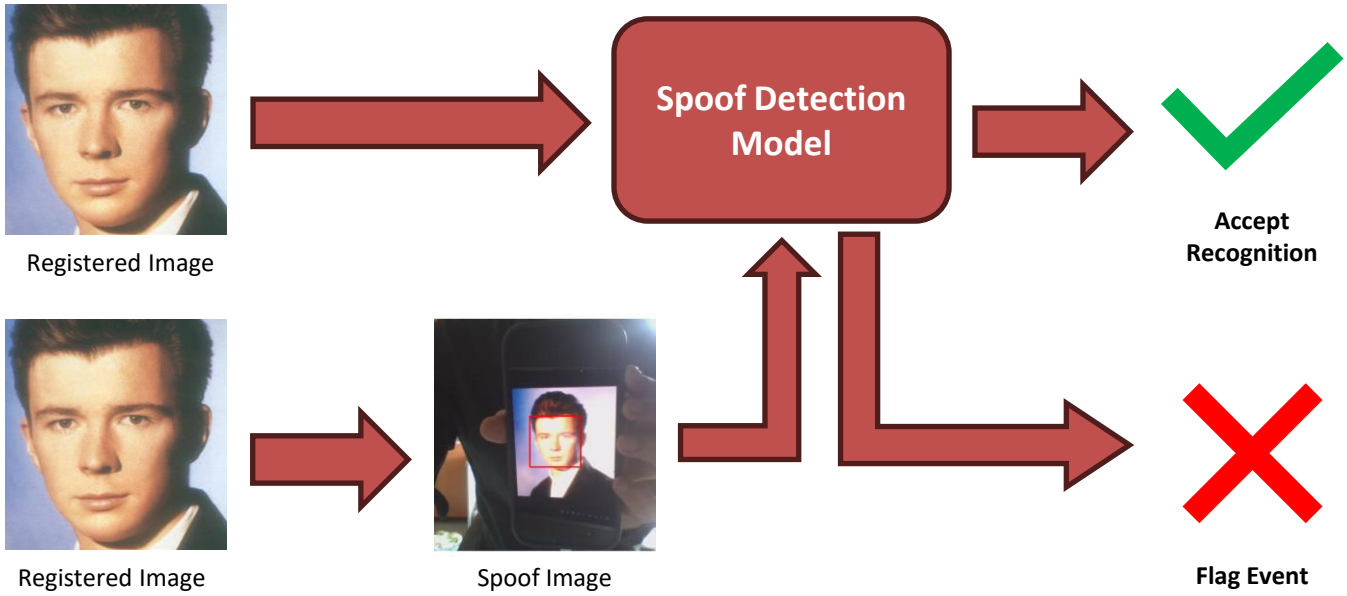


Registration Quality Segregator Progress



***Limited Details Provided as per company confidentiality**

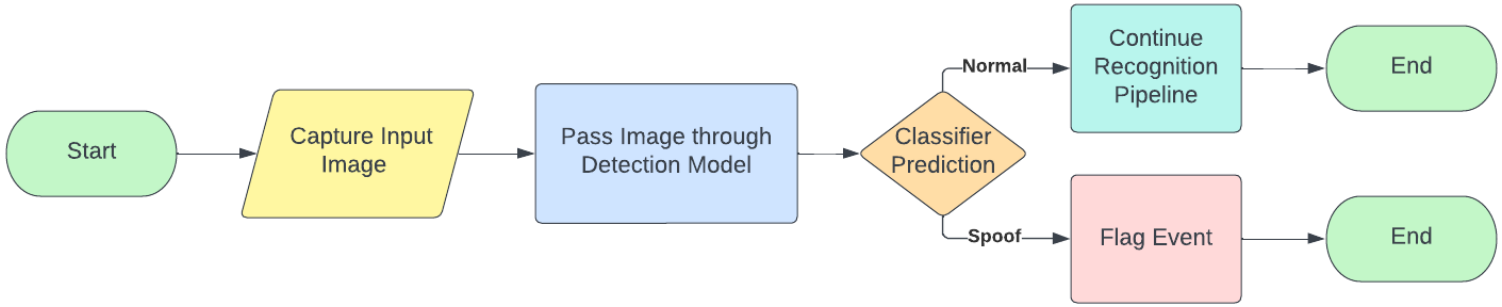
2 – Spoof Detection Finetune Dataset



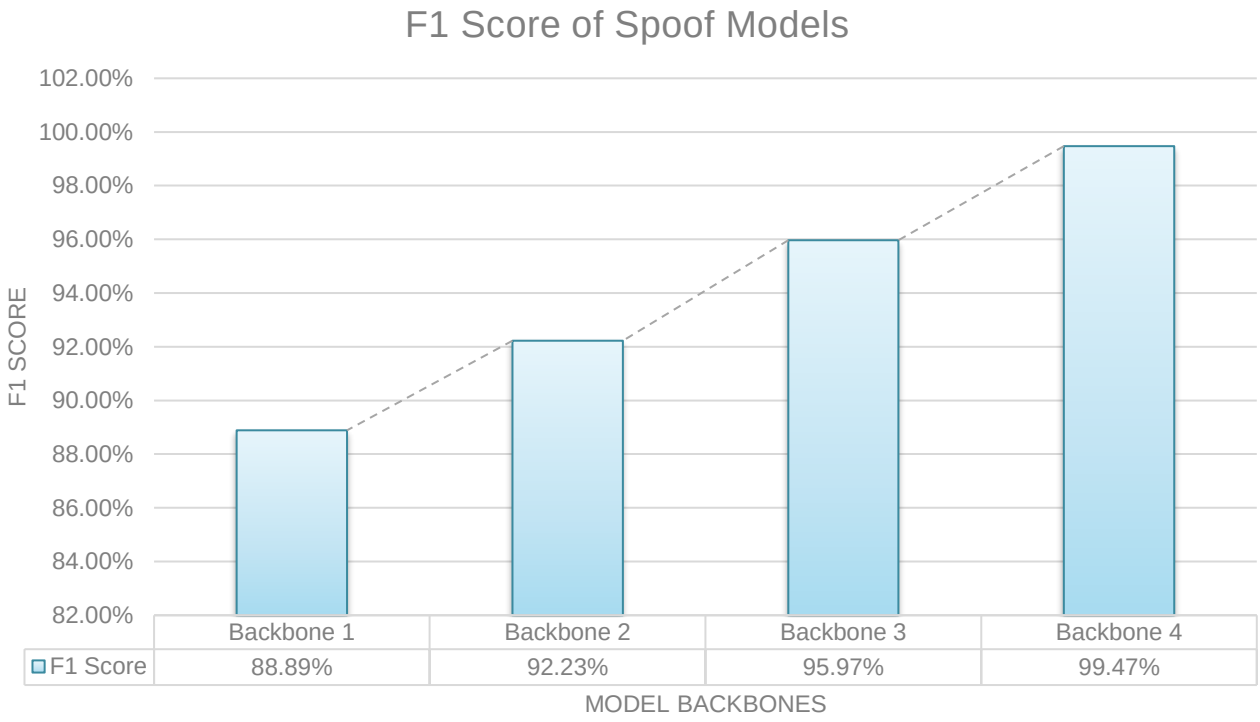
Spoof Detection contd.

Process Pipeline Explained

Spoof Flow Diagram



Spoof Detection Results Progress



***Limited Details Provided as per company confidentiality**

3 – Research and Miscellaneous Projects

- Research on workflow of website development.
- Research and analysis of tools to assist website development.
- Research on assistance of AI in development process.

Website Development Deck

- Research on processes and practices to standardize software dev process.
- Analysis of current tools used for standardization.

Software Factory

- Research on software development framework for large enterprises.
- Understood agile methodologies and various framework roles.

Scaled Agile Framework

- Research on large scale facility management.
- Collected resources and papers on processes involved in Facility Management
- Research on AI assistance in Facility Management.

Facility Management

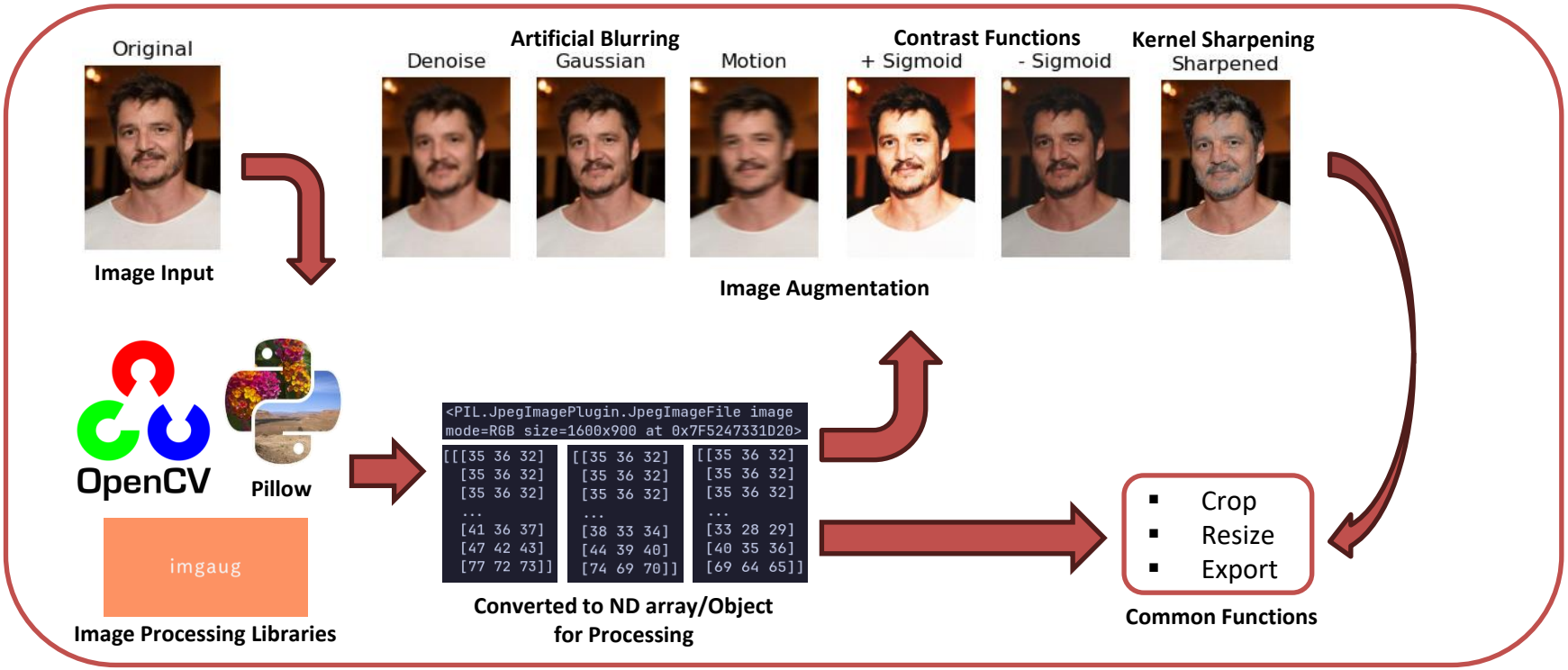
- Manual sensor checking and certification to find wrongly installed/defective sensors.
- Created a spreadsheet with sensors and their conclusions.

Remote Site Sensor Certification

Technical Tasks Performed Across Projects

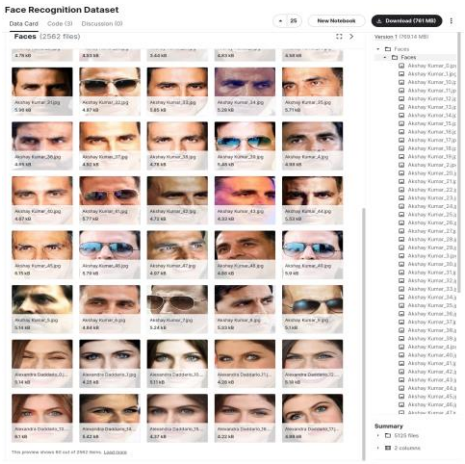
Image Processing and Augmentation

Convert Images into processable format → Perform operations → Create new images from old images → Generate requirement specific images → Introduce variety in dataset



Dataset Creation

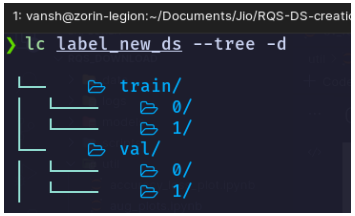
Compilation of requirement specific data → Cleaning raw data → Label data → Split into train/val/test split



Raw Data from Open-Source DS

Data Cleaning

Data Labelling



Splitting Data

A Good Dataset

- Enough variety in data for good fitting and generalization.
- Data accurate to their respective label to prevent model confusion.
- Images with just enough label related features to prevent feature overload.

Properties of a Good DS

Transfer Learning Pipeline

Deep Learning Framework
- Load Model Architecture
- Modify/Freeze Model Layers

Set Parameters
- Optimizer function, Loss function
- Number of epochs, Step size
- Learning rate, Decay

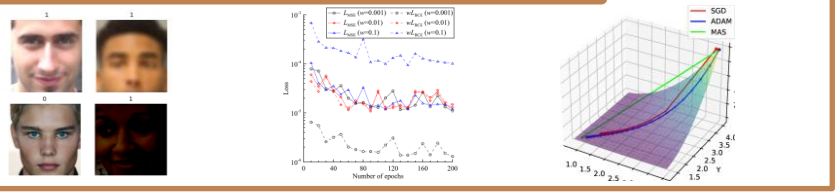
Train Model on Dataset
- Analyze training data
- Determine model fitting
- Export trained model

Evaluate Model
- Confusion Matrix
- Accuracy
- F1 scrore
- Precision
- Recall

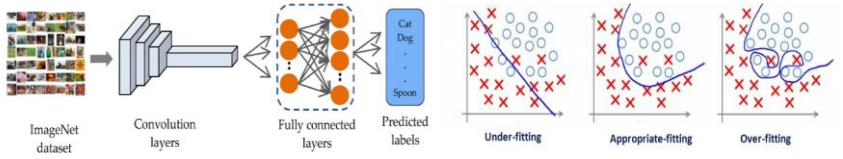
Frameworks

PyTorch fast.ai

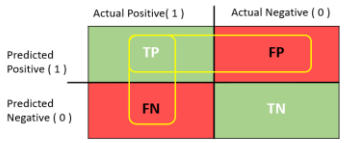
Dataloader, Loss, Optimzers



Training, Fitting



Evaluate Model

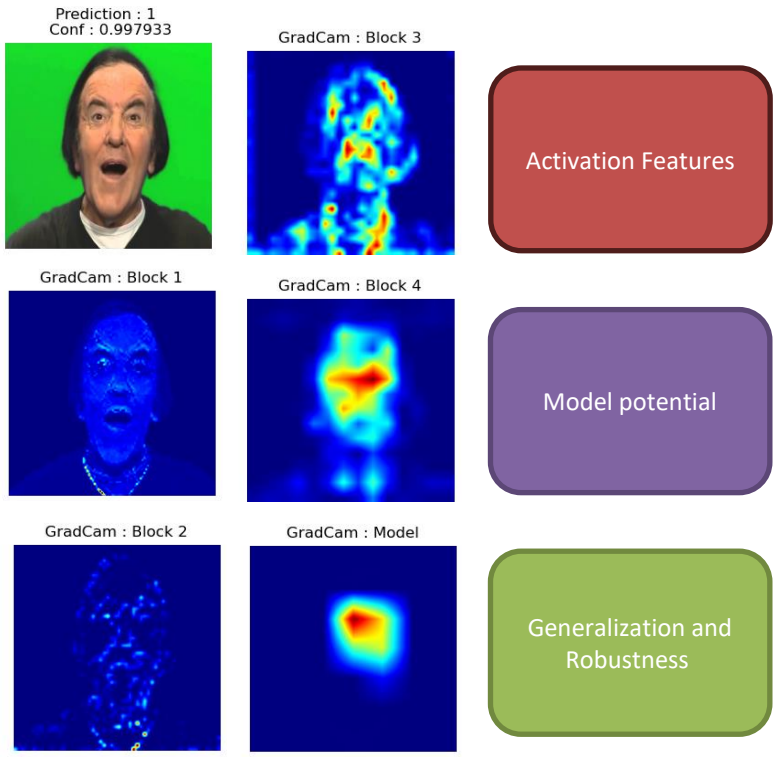


$$Accuracy = \frac{T_p + T_n}{T_p + T_n + F_p + F_n} \qquad Precision = \frac{T_p}{T_p + F_p}$$

$$F_1 = 2 \cdot \frac{precision \cdot recall}{precision + recall} \qquad Recall = \frac{T_p}{T_p + T_n}$$

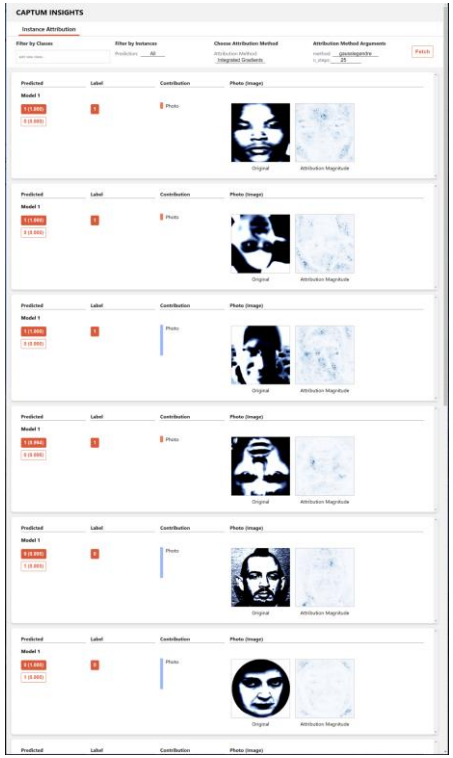
Model Analysis Utilities

GradCam (Gradient Weighted Class Activation Mapping)



Layer by Layer GradCam

Captum Insights



Feature Ablation Indicates Feature Extraction

Servers and Containerization

Servers

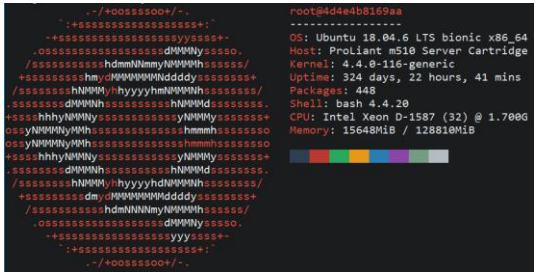
- Store and interact with in-house data.
- Generate and execute code on said data.
- Data transfer.

Containers

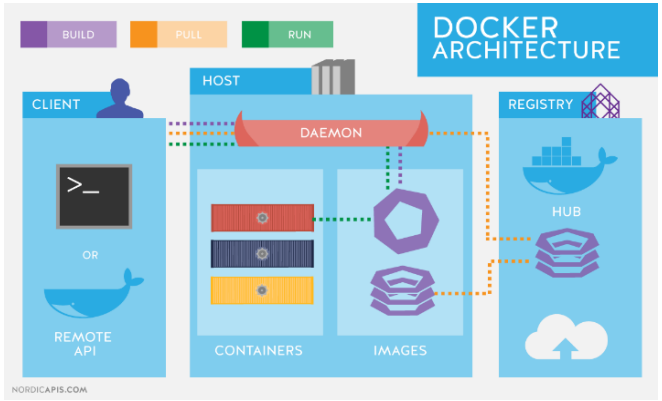
- Separate dev environments on same server to prevent dependency conflicts.
- Package and transfer containers across different systems.
- Provide system independency.

Tasks Performed

- Create dockerfile, docker image and docker container.
- Export docker container.
- Configure server and install drivers.
- Configure Nvidia CuDA for accelerated computing.



Ubuntu Server

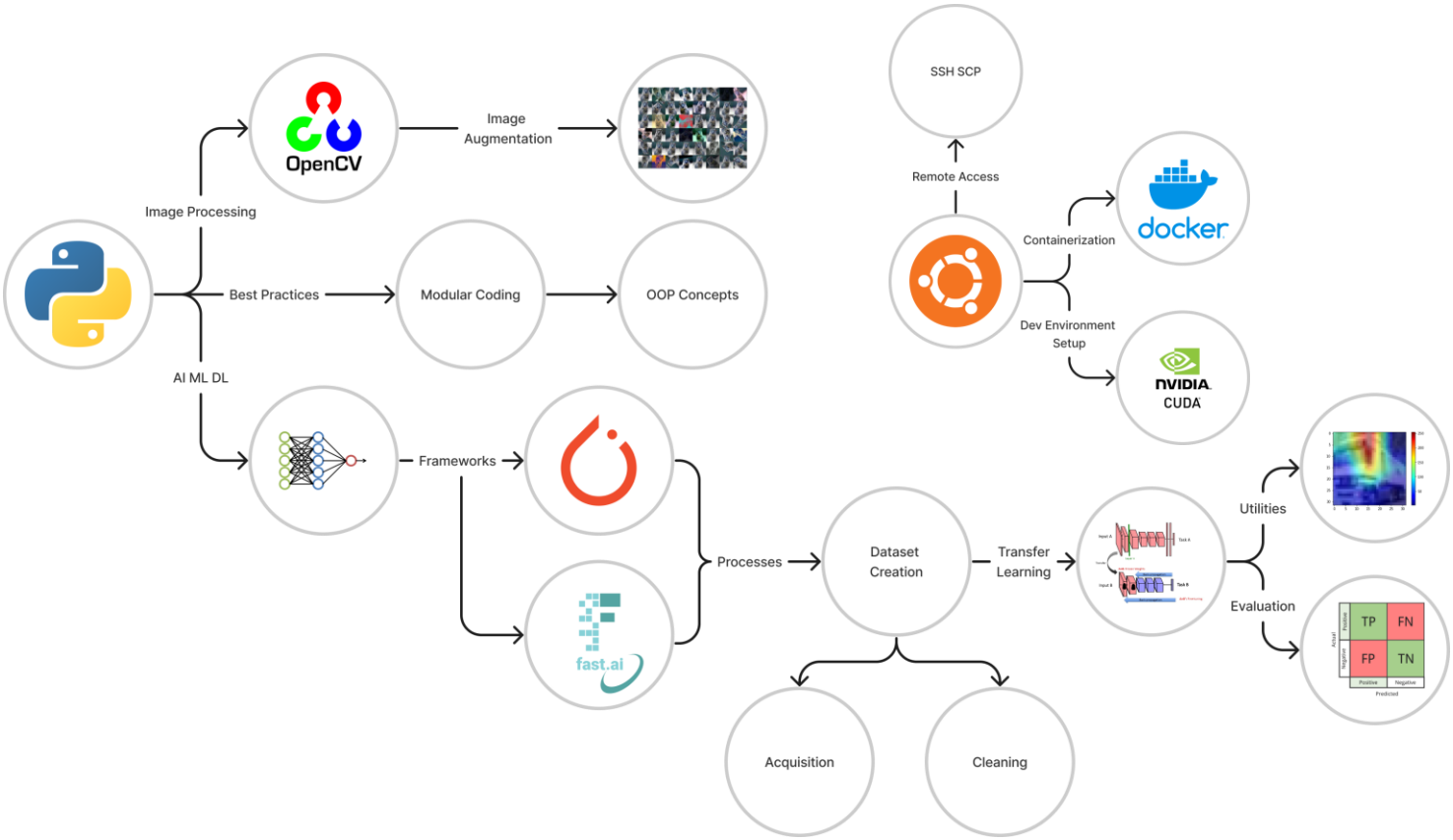


Docker Architecture

New Skills Gained

- Teamwork and Load distribution
- Brain storming and Research
- Understanding reliable sources of information
- Adaptability and Out of the box thinking
- Time management
- Communication and Conferencing
- Networking
- Agile development methodologies
- Software Development best practices
- Real-world problem-solving skills

Overall Learnings



Comments and Future Plans

As an intern in the New Initiatives AI/ML department at Jio Platforms, I have the opportunity to work on exciting projects and gain valuable experience in the field of AI and ML. In conclusion, I have the following takeaways:

- Interning at Jio allowed me to learn valuable skills and knowledge
- Allowed me to network with individuals with unique experiences and skillsets.
- Provided me with motivation to learn more about AI/ML.

My future plans of action would be:

- Build my portfolio with more AI/ML based projects.
- Staying up to date with the latest technologies.
- Build a stronger profile by networking and collaborating with our individuals in the field.

Questions??

Thank You