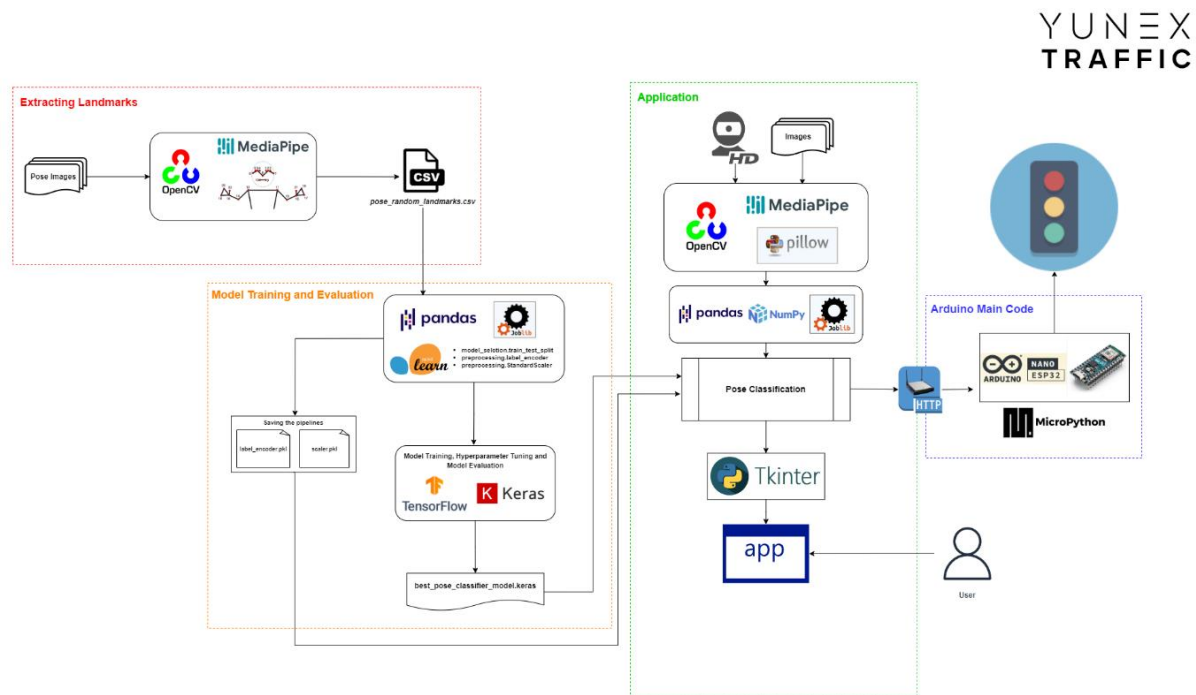


Yunex Traffic UK Industrial Placement – Akul Bharadwaj

1. AI Traffic Light - an AIoT based project on Pose Detection through Computer Vision for London Transport Museum Depot Open Days



AI TRAFFIC LIGHT

Product Development, Yunex Traffic UK R&D

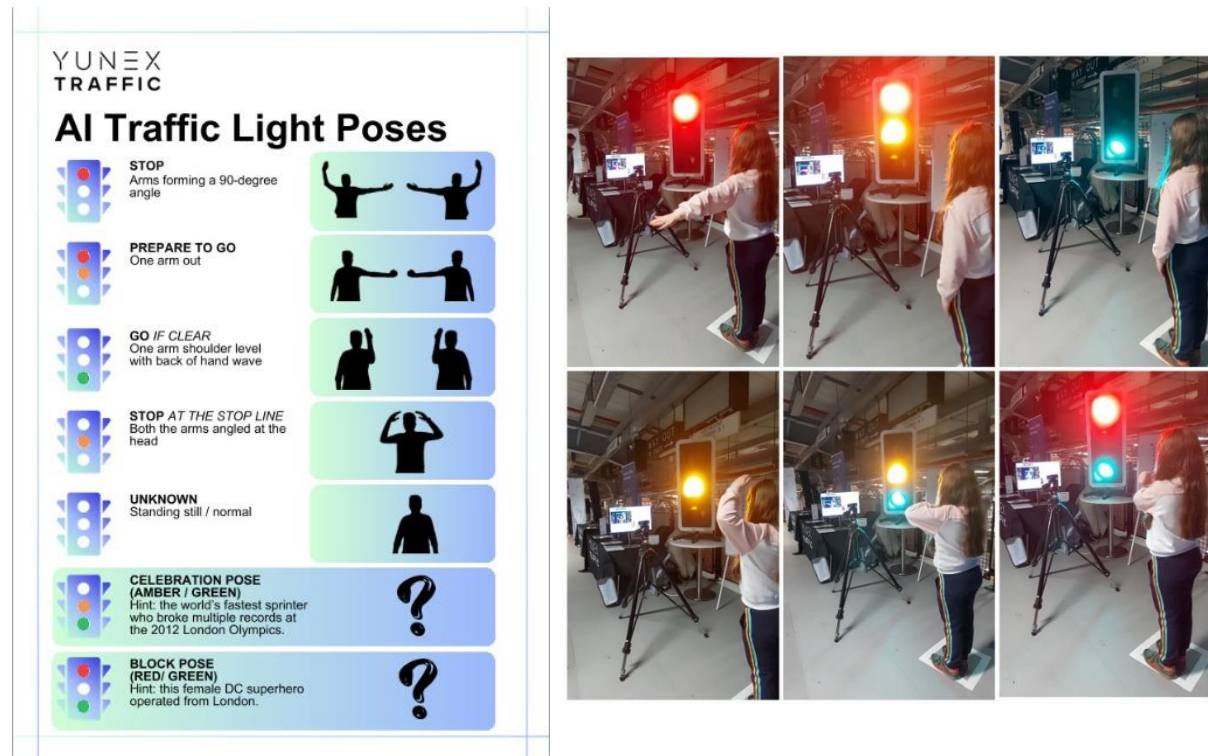
Flow Architecture

This was a project done for the Depot Open Days from 5th to 7th of July 2024 at London Transport Museum Depot in Acton, as one of the interactive activities in the STEM zone educating young children about the sequence of a traffic light using pose detection.

I have used Google's MediaPipe Pose Detection and OpenCV to extract the first 22 landmarks from around 200 images for different poses and stored it as CSV file containing the x, y & z coordinates of each of the landmark for that pose label. This data file is further split into train and test data with some data pre-processing using Scikit-Learn. Then saved the pipelines using the Joblib library. Further, I created a neural network i.e. a Multi-Layer Perceptron model with TensorFlow & Keras and trained the model on the train data and tested on test data, Then, I performed hyperparameter tuning using Keras-Tuner and found the best model with 94% accuracy. This model was then saved,

For the application, the webcam feed was taken into consideration with OpenCV and MediaPipe. The data pre-processing pipelines were applied to the oncoming landmarks data and the saved model was deployed to predict and classify poses. The GUI used here was Tkinter. Then upon the correct classification, it would update the Arduino Nano ESP32 based traffic light developed by a senior engineer coded in MicroPython with the required colours and combination by sending requests via an HTTP server.

On the event days, the kids were very much excited to try out doing the poses and see the lights change. It was fun to teach and interact with them.



Event Poster (left) and A girl interacting with the AI Traffic Light (right)

The LinkedIn post from London Transport Museum:

https://www.linkedin.com/posts/london-transport-museum_we-were-delighted-to-welcome-so-many-visitors-activity-7216418374212296704-goeA?

2. Business Impact Project

This was one of the team-based Business Impact Project for the year 2023-2024 in Yunex Traffic UK as part of their Entry Level Talent Development, where I and my team were involved in creating and delivering a virtual work experience programme.

We executed this project in partnership with Springpod and with a lot of teamwork, management and coordination, we successfully completed the project within the given timeframe.



Certificate

This is to certify that

**Akul Bharadwaj Bangalore
Harish**

Has participated in the Business Impact Project 2023-2024
and worked on the
Yunex Traffic Virtual Work Experience Programme

**YUNEX
TRAFFIC**

Poole, 15th May 2024

B. P. Lawson

Bruce Lawson
Head of Training Services

More details about the virtual work experience programme:

https://www.linkedin.com/posts/springpod_workexperience-smartcity-sustainability-activity-7224685870577053696-nNnd?

3. Soft skills training as part of Intern Development Programme



Uniting
what's next
in traffic.

Certificate

This is to certify that

Akul Bharadwaj Bangalore Harish

Has successfully completed the Intern Development Programme

2023-2024

Training courses completed:

Induction
Early Career Pensions Masterclass
Financial Wellbeing
Sustainable Spending
Team Dynamics
Wellbeing
Business Influencing Skills
Disability Awareness
Emotional Intelligence Reframe
Equality Diversity and Inclusion
Self-Development
Communications Skills
Sales for Non-Sales

Poole, 7th June 2024

B. P. Lawson

Bruce Lawson
Head of Training Services

YUNEX
TRAFFIC










4. Technical skills training certificates

<https://skillsoft.digitalbadges-eu.skillsoft.com/profile/eu-akulbharadwaj387637/wallet>

 **Akul Bharadwaj**
9 Credentials | 1 Issuer

Wallet

Transcript

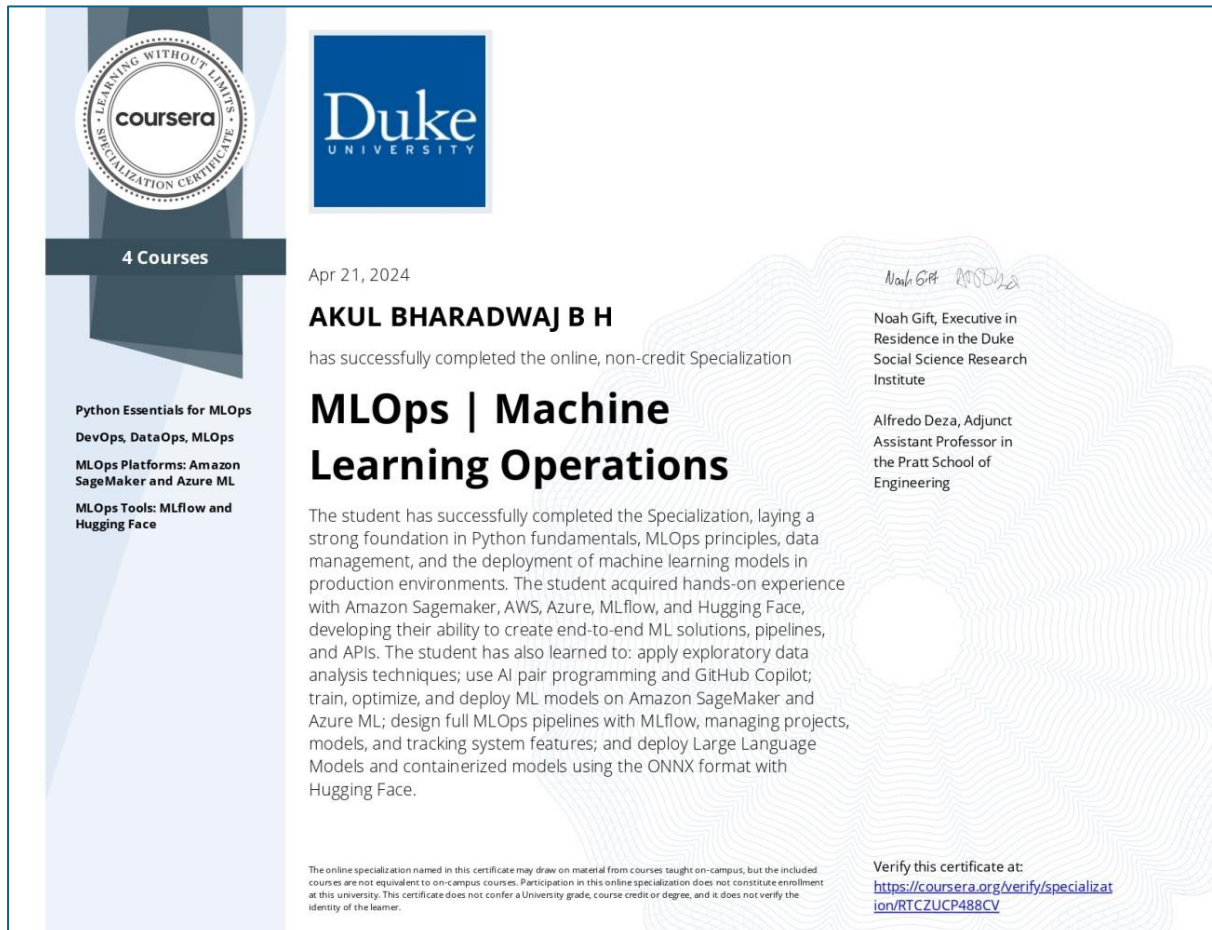
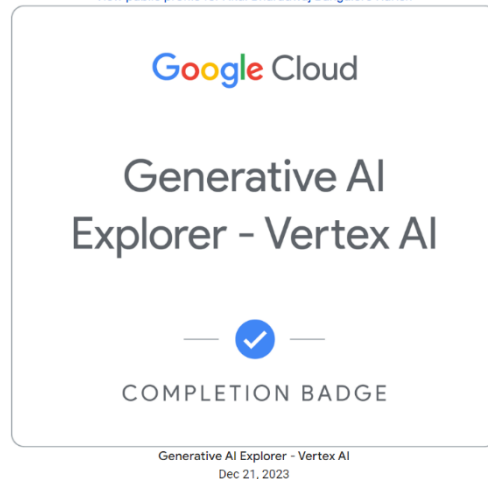
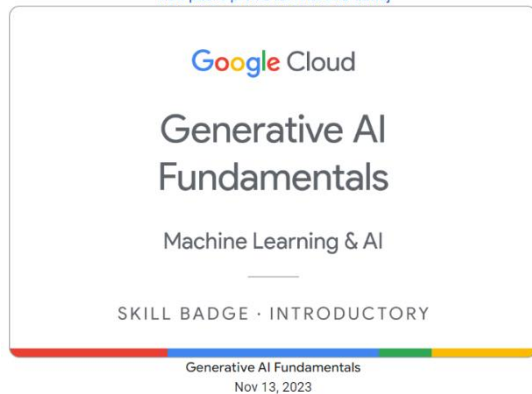
 <p>Traditional Data Architectures: Relational Databases COURSE COMPLETION</p>	 <p>Traditional Data Architectures: Data Warehousing and ETL Systems COURSE COMPLETION</p>	 <p>Data Engineering Getting Started COURSE COMPLETION</p>	 <p>AWS SysOps Associate 2022: Managing Application Workloads COURSE COMPLETION</p>
<p>Traditional Data Architectures: Relational Databases February 15, 2024 Skillsoft</p>	<p>Traditional Data Architectures: Data Warehousing and ETL Systems February 15, 2024 Skillsoft</p>	<p>Data Engineering Getting Started January 29, 2024 Skillsoft</p>	<p>AWS SysOps Associate 2022: Managing Application Workloads September 28, 2023 Skillsoft</p>
 <p>AWS SysOps Associate: EC2 Instance Management COURSE COMPLETION</p>	 <p>AWS SysOps Associate: S3 Storage Management COURSE COMPLETION</p>	 <p>CompTIA Linux+: Infrastructure as Code and Git COURSE COMPLETION</p>	 <p>AWS SysOps Associate: Cloud Basics COURSE COMPLETION</p>
<p>AWS SysOps Associate: EC2 Instance Management September 26, 2023 Skillsoft</p>	<p>AWS SysOps Associate: S3 Storage Management September 22, 2023 Skillsoft</p>	<p>CompTIA Linux+: Infrastructure as Code and Git September 19, 2023 Skillsoft</p>	<p>AWS SysOps Associate: Cloud Basics September 18, 2023 Skillsoft</p>
 <p>CompTIA Linux+: Application Containers COURSE COMPLETION</p>			
<p>CompTIA Linux+: Application Containers September 15, 2023 Skillsoft</p>			

Akul Bharadwaj Bangalore Harish has earned this award!

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<https://www.coursera.org/account/accomplishments/specialization/RTCZUCP488CV>

5. Volunteering and STEM Outreach

- St Edward's School, Poole. Careers Fair - November 2023
- Parkstone Grammar School Careers Convention - March 2024
- London Transport Museum Depot Open Days - July 2024
- re:connect conference, Bournemouth and Poole College - August 2024



St. Edwards School Careers Fair, Poole



re:connect Conference - Bournemouth and Poole College, Poole



Parkstone Grammar School
Careers Convention, Poole



London Transport Museum Depot Open Days, Acton



More about my volunteering stints:

https://www.linkedin.com/posts/akul-bharadwaj-b-h-348aa9163_traffictransformers-apprenticeships-careers-activity-7131319895706755072-XuhP?

https://www.linkedin.com/posts/akul-bharadwaj-b-h-348aa9163_technology-process-people-activity-7217433905723777025-x0o5?

https://www.linkedin.com/posts/akul-bharadwaj-b-h-348aa9163_techconference-dorset-innovation-activity-7229603559477055488-CeZ8?