AirPic

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Overview

To capture moments effortlessly with an intuitive gesture-powered photo experience that sets a new standard in camera interaction.

Tech Stack

App Development

- Android Studio - Local IDE
- Kotlin
- Android Splash Screen API
- Accompanist Permissions Library - Handling Audio and Camera Permissions
- Android ViewModel - Store & Manage UI - related Data
- Android Jetpack Navigation Component (NavHost and NavController classes) - Navigation between fragments
- Android Jetpack Compose (Compose Modifier, LaunchedEffect) - UI Development
- Android CameraX API (CameraController, Preview View, LifecycleCameraController classes) - Camera Operations

Tech Stack

App Development

- Kotlin CoRoutines - Asynchronous Programming in Camera and Background Operations
- Android Material Design Component - Button, IconButton, BottomSheetScaffold, TopAppBar, Image, and Text
- Android MediaStore API - To store the captured images and videos in the device media's database
- Toast - Displays short-duration messages
- ContextCompat - Used to ensure that the app can run on different Android versions

Tech Stack

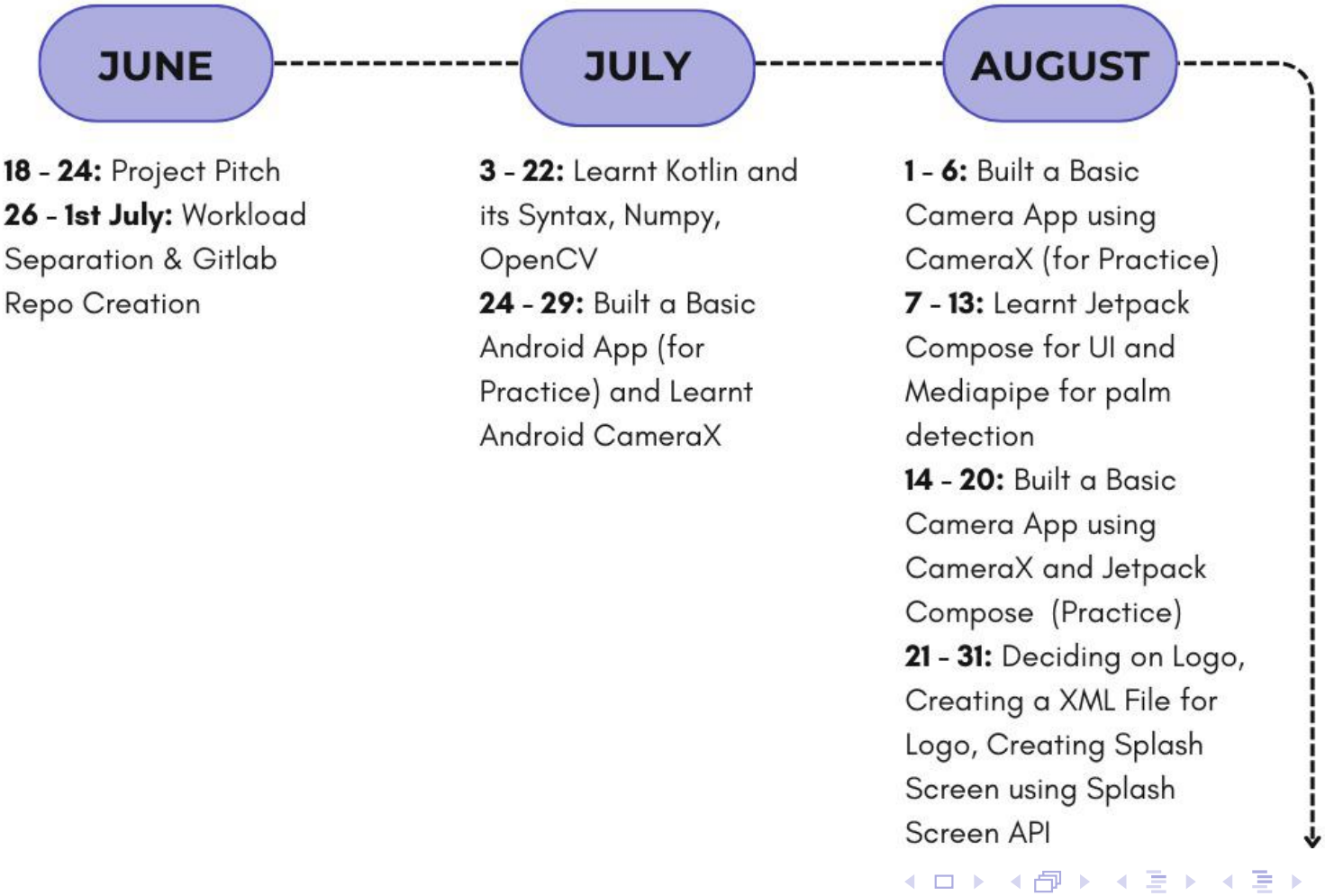
Smile Detection

- Google Colab - Online IDE
- Visual Studio Code - Local IDE
- Tensorflow's Keras API
- VGG16 (Visual Geometry Group 16) - a pre-trained feature extractor to capture image patterns, enhancing the model's ability to detect smiles.

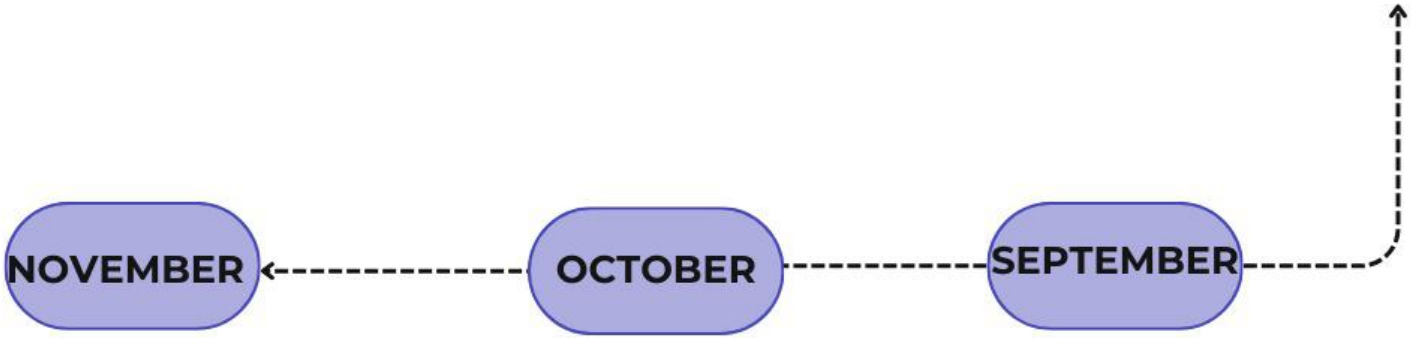
Hand Gesture Detection for Capturing Photos & Zooming In and Out

- Visual Studio Code - Local IDE
- OpenCV (imutils) - capturing video from the camera
- Mediapipe (Hands) - Hand tracking model
- NumPy - To handle numerical operations

Timeline


JUNE
18 - 24: Project Pitch
26 - 1st July: Workload Separation & Gitlab Repo Creation
JULY
3 - 22: Learnt Kotlin and its Syntax, Numpy, OpenCV
24 - 29: Built a Basic Android App (for Practice) and Learnt Android CameraX
AUGUST
1 - 6: Built a Basic Camera App using CameraX (for Practice)
7 - 13: Learnt Jetpack Compose for UI and Mediapipe for palm detection
14 - 20: Built a Basic Camera App using CameraX and Jetpack Compose (Practice)
21 - 31: Deciding on Logo, Creating a XML File for Logo, Creating Splash Screen using Splash Screen API

Timeline



SEPTEMBER

1 - 7: Worked on Camera Permission Screen using XML

8 - 14: Worked on Audio Permission Screen using XML

15 - 21: Built the Main Screen using Camera Controller

22 - 30: Built Top Bar Buttons (four) and Bottom Bar Buttons (five) using Jetpack Compose

OCTOBER

1 - 8: Smile Detection Model Creation, Implemented Logic for Photo and Video Mode Implemented Take Photo and Take Video Functionality

17 - 24: Fine Tuning Smile, Palm and Face Detection Models & Implemented Logic for Timer & Flash Buttons

25 - 31: Implemented Logic for Hand Gesture and flip Camera Button, Converted Smile Detection Model, Palm Detection Model and Zoom Pinching Model to TFlite

NOVEMBER

1 - 8: Completed the Whole Functionality for the Info Button and created partial functionality for the Gallery Button

9 - 15: Integrating Tflite models to App

Project Limitations

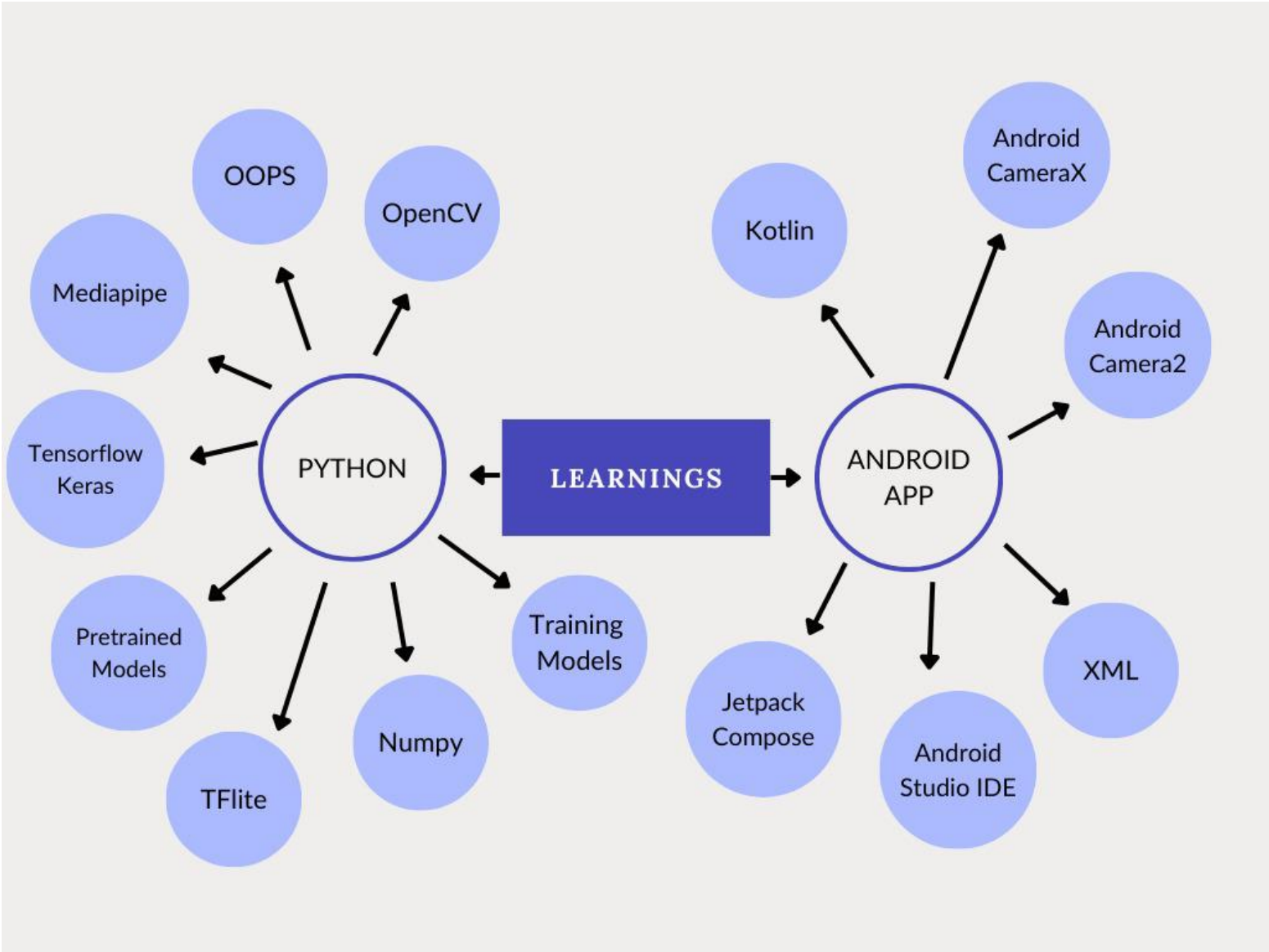
Challenges and Progress in Integrating Models with Camera App Development

Demo

We will be demonstrating the following models

- AirPic: The App
- Smile Detection Model
- Palm Detection Model
- Gesture Model for Zooming In and Out

Learnings


LEARNINGS
PYTHON
OOPS
OpenCV
Mediapipe
Tensorflow
Keras
Pretrained
Models
Training
Models
Numpy
TFlite
ANDROID
APP
Kotlin
Android
CameraX
Android
Camera2
Jetpack
Compose
Android
Studio IDE
XML

Future Scope

1. To implement customized in-app settings such as grids and HDR.

2. Create a centralized in-app Gallery for efficient management and viewing of images and videos, enhancing user experience

3. Develop our project into an iOS App

4. Enrich user experience by incorporating intuitive gestures like turning on the video or activating the timer.

5. Transform our project into a vibrant social platform, fostering connections and collaboration.

Conclusion & Thank You

We value and appreciate your feedback.