

Project Proposal for

Smart Access System

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Problem Statement

The main objective for Smart Access System is to implement face recognition method that helps in identifying the individuals which can be utilized in access management and maintaining of records.

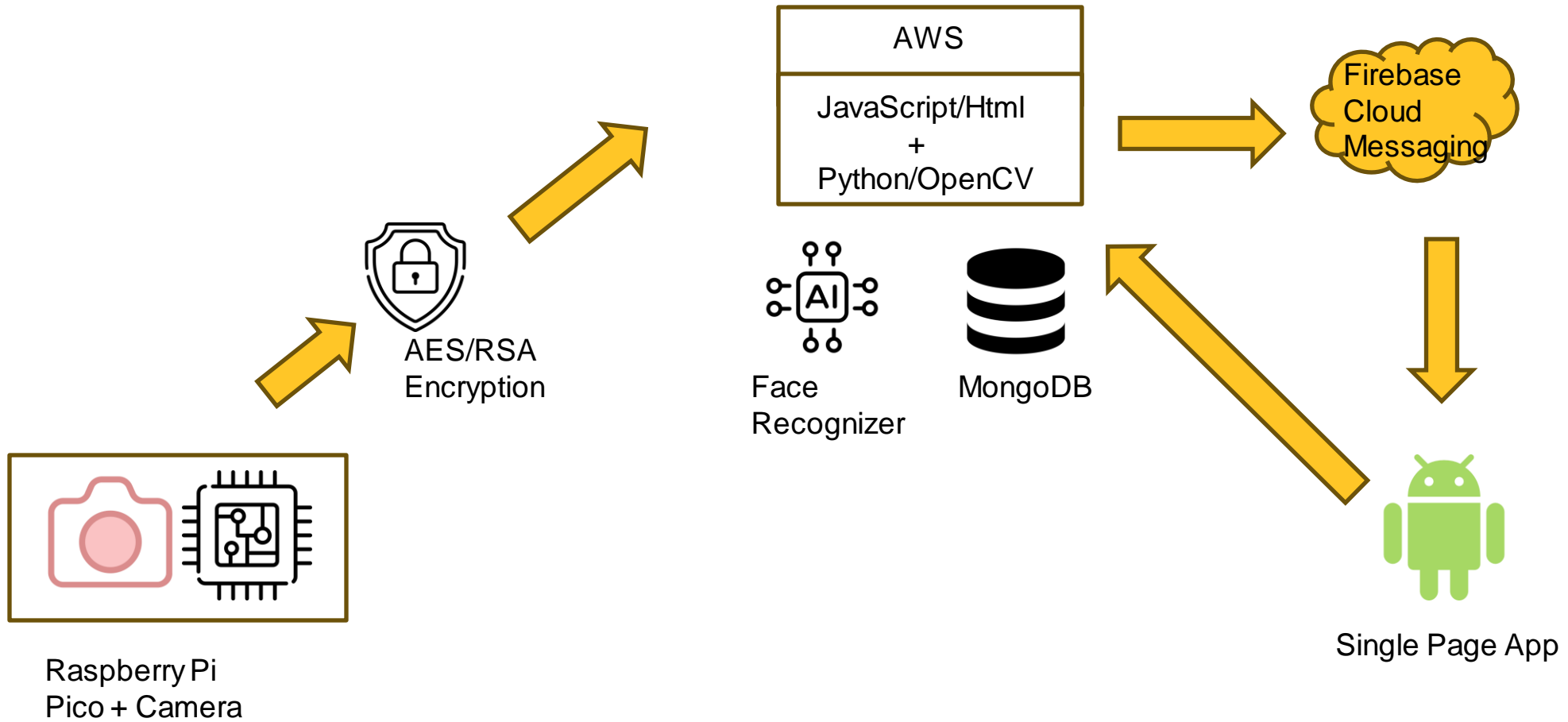
We use Raspberry Pi and a camera as the end-client which connects with a Linux server.

Additionally, we will also develop an Android app which will serve as an admin-controlled client.

Use Cases

- ❖ Finance and Banking:
 - Secure Entry and Exit to restricted places.
- ❖ Healthcare Industry:
 - Patient Record Verification
- ❖ Security and Access Control:
 - Biometric Authentication

Architecture



Tech Stack

- We will use **Python/OpenCV** on Raspberry Pi to capture face data. This data will be encrypted using **AES/RSA** and will be sent over to the server.
- The **Linux server** will be orchestrated using **AWS EC2**.
- The server will be written using **Java-script with a HTML** page to access records.
- The facial recognition part will be done using **Python/OpenCV** pre-trained models which will be connected to the running server.
- The records of all entries/exits will be stored in database served by **MongoDB**.
- For the admin-controlled **Android** application, we will use **Java/Kotlin**.
- The server will communicate with the application using **Firebase Cloud Messaging** notifications.

Timeline

Tasks

Week 1	Week 2	Week 3	Week 4	Week 5
<p>Project Planning and Deployment</p> <p>Setting up the workspace with Raspberry Pi and Pi cam.</p>	<p>Implementation of Data Encryption</p> <p>For secure communication, AES and RSA encryption is carried over.</p>	<p>Model Development and Training</p> <p>Decide the Algorithm(OpenCV) and pre-process the dataset.</p>	<p>Hardware Integration</p> <p>Send the trained dataset to the Raspberry Pi and connect the camera module and capture the images. Then connect the Hardware to the AWS .</p>	<p>Android Environment Setup</p> <p>Create an Application to receive the data from the cloud to provide the access and store the dataset in the database(MongoDB).</p>