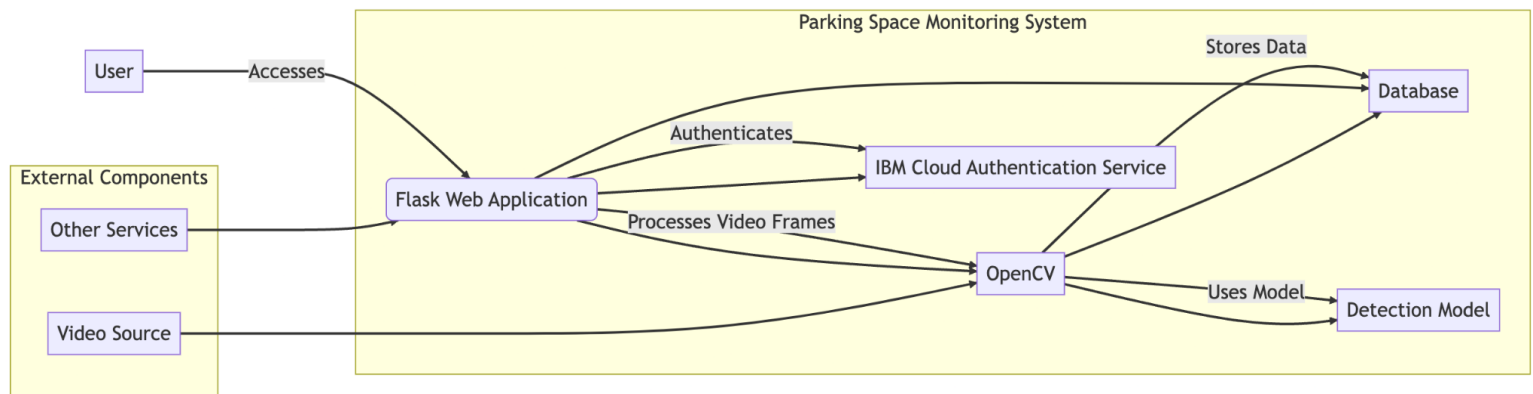


Technical Architecture:



Open-Source Frameworks & Third-Party API's:

1. OpenCV (Open Source Computer Vision Library):

- OpenCV is a widely-used open-source computer vision and image processing library.
- It provides a collection of functions and algorithms for tasks such as image and video processing, object detection, and machine learning.
- OpenCV is written in C++, but it also provides APIs for Python and other programming languages.
- It offers a comprehensive set of tools for video frame analysis, making it suitable for tasks like detecting parking spaces and counting free spaces.
- OpenCV's extensive documentation, large community, and active development make it a popular choice for computer vision projects.

2. Flask:

- Flask is a lightweight and flexible open-source web framework written in Python.
- It provides a simple yet powerful way to build web applications.
- Flask follows a microframework approach, meaning it focuses on simplicity and extensibility.
- It offers features like URL routing, request handling, session management, and templating for building web applications.
- Flask's simplicity and modular design make it a popular choice for developing small to medium-sized web applications, including APIs and microservices.
- It integrates well with other Python libraries and frameworks, making it suitable for the Parking Space Monitoring System's web application component.

3. IBM Cloud Authentication Service:

- The IBM Cloud Authentication Service is a cloud-based authentication and authorization service provided by IBM Cloud.

- It allows developers to secure their applications by integrating authentication mechanisms easily.
- The service provides features like user management, multi-factor authentication, and social login integration.
- IBM Cloud Authentication Service supports various authentication protocols and standards, including OAuth and OpenID Connect.
- It simplifies the process of implementing user authentication and authorization in web applications, ensuring secure access to the Parking Space Monitoring System.

These open-source frameworks play a crucial role in the architecture, enabling the Parking Space Monitoring System to leverage computer vision capabilities, build a user-friendly web application, and ensure secure authentication and authorization for users. Their active communities, extensive documentation, and widespread usage contribute to their popularity and reliability in developing robust and scalable systems.