Vision API Object Detection Tool

Overview

This Streamlit web application allows users to upload an image, select (crop) a desired region, and run **Google Cloud Vision API** to detect and label objects within that selected area.

Features

- **Upload any image** (`.jpg` , `.jpeg` , `.png`)
- **Interactive cropping tool** powered by `streamlit-cropper`
- **Adjustable aspect ratios** (Free, 1:1, 16:9, 4:3)
- **Google Cloud Vision API integration** for object detection
- **Instant cropped preview and JSON results** display

Tech Stack

- **Python 3.10+**
- **Streamlit**
- **Pillow (PIL)**
- **NumPy**
- **streamlit-cropper**
- **Google Cloud Vision API**

Prerequisites

1. A **Google Cloud project** with the **Vision API** enabled.
2. A **service account key JSON file** downloaded from your GCP Console.

⚙️ Setup Instructions

Step-by-Step Guide to Set Up Google Cloud Vision API

Follow these steps to create and connect your API key securely:

---

1. Create a Google Cloud Project

1. Go to Google Cloud Console.
2. Sign in with your Google Account.
3. Click the **Project Dropdown** → **New Project**.
4. Give it a name (e.g., `vision-api-demo`) and click **Create**.

Enable the Vision API

1. Once inside your project, open the **Navigation Menu** → **APIs & Services** → **Library**.
2. Search for **"Vision API"**.
3. Click on it → **Enable**.

Create a Service Account

1. Go to **Navigation Menu** → **IAM & Admin** → **Service Accounts**.
2. Click **+ Create Service Account**.
3. Name it (e.g., `vision-service-account`).
4. Under "Grant this service account access", choose:
   - **Project** → **Editor** (for testing; you can later restrict to Vision API only).
5. Click **Done**.

Generate and Download the Key

1. In the Service Accounts list, click your newly created account.
2. Go to the **Keys** tab.
3. Click **Add Key** → **Create New Key** → **JSON**.
4. A `.json` file will be downloaded automatically — **this is your API key file**.

> 🔒 Keep it safe — it gives full access to your project's Vision API.

2. Install dependencies

```
pip install streamlit pillow numpy streamlit-cropper google-cloud-vision
```

3. Set the Google credentials

Make sure your JSON key file is in the working directory, then set the environment variable:

- For Windows

```
set GOOGLE_APPLICATION_CREDENTIALS="your_service_account.json"
```

- For macOS/Linux

```
export GOOGLE_APPLICATION_CREDENTIALS="your_service_account.json"
```

Run the app

```
streamlit run app.py
```

4. Upload and detect

- Upload your image
- Crop any region
- Click **“Run Detection”** to get object labels from Vision API

Example Output

Furniture (0.89)
Loveseat (0.76)

File Structure

```
VisionAPI-Tool
|
|--creds
|   |--vision-api-key.json
|--app.py
|--example-img.jpg
|--README.pdf
```

Notes

- Works best on high-resolution images.
- Ensure your Google Cloud key has proper Vision API access.
- If API quota is exceeded, you may get an authentication or rate-limit error.