**Smishing Detection App - OCR Functionality**

The Smishing Detection App is an Android application designed to detect phishing attempts through SMS (Smishing). This document provides information on the implementation of the OCR feature and its integration with Google Cloud Vision and Translation APIs.

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**Structure**

* MainActivity.java: The primary activity handles user interactions, image selection, and OCR processing.
* OCRProcessor.kt: A Kotlin class responsible for performing OCR using Google Cloud Vision API and translating text using Google Cloud Translation API.
* res/: Contains resources such as layouts, images, and application configuration files.
* AndroidManifest.xml: The manifest file declares essential information about the app and the required permissions.

**MainActivity Overview**

1.1. Initialisation

The MainActivity.java is the application's entry point. It initialises the UI components and the OCRProcessor, handles user interactions, and manages the app's main workflow.

* + UI Components:
    - ImageView imageView: Displays the selected image.
    - TextView textView: Shows the extracted and translated text.
    - ActivityResultLauncher<Intent> imagePickerLauncher: Manages the result of the image picker.
  + Initialisation of OCRProcessor:
    - OCRProcessor ocrProcessor: This object handles the OCR and translation operations.

1.2. OCRProcessor Integration

The OCRProcessor is integrated within the MainActivity to extract text from images and translate it to the target language.

* + openImagePicker(): Launches the image picker so the user can select an image from the gallery.
  + processSelectedImage(Uri imageUri): Processes the selected image using the OCRProcessor, extracts text, and translates it.

1.3. Image Picker and Processing

The image picker allows users to select an image, which the OCRProcessor then processes. The selected image is displayed in the ImageView, and the extracted text is shown in the TextView.

* + ActivityResultLauncher: The new ActivityResultLauncher API handles the image picker's results efficiently.

**OCRProcessor Class**

2.1. Overview

The OCRProcessor.kt class is a Kotlin class that encapsulates the logic for performing OCR and translating the extracted text. It utilises the Google Cloud Vision API for OCR and the Google Cloud Translation API for text translation.

2.2. Key Methods

* + initializeClients(): Initialises the Google Cloud Vision and Translation clients.
  + processImage(Uri imageUri, String targetLanguage, OCRCallback callback): Processes the provided image, performs OCR, and translates the text.
  + translateText(String text, String targetLanguage): Translates the provided text to the target language using the Google Cloud Translation API.

Permissions

To allow the application to access the internet (necessary for making API calls to Google Cloud services), the following permission is added to the AndroidManifest.xml:

<uses-permission android:name="android.permission.INTERNET" />

**Error Handling**

The app uses robust logging and error handling to ensure smooth operation. Errors during the image processing or network operations are caught and logged using Android's Log.e for easier debugging.

**Testing and Validation**

* + Functional Testing:
    - Test the image picker by selecting various images.
    - Validate that the OCR correctly extracts text from different image types.
    - Test the translation feature with different languages.
  + Compatibility Testing:
    - Run the app on different Android versions and device sizes to ensure compatibility.