Design Credit Project Report

Image Text Conversion (Hindi-English | English-Hindi)

Contributors:

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Project overview:

The Image Text Conversion model is highly useful for breaking language barriers in real-time. It allows users to effortlessly convert text from images between Hindi and English, making it easier for people to understand signs, notices, and documents in different languages. This is especially beneficial for travelers, non-native speakers, and anyone needing quick translation. By automating text detection and translation, it saves time and reduces the complexity of manual translation, making it an efficient solution for diverse real-world scenarios like tourism, education, and public services.

Objective:

The goal of our project was to develop a UI for a ML model that can:

- Take an input image (with Hindi or English text)
- Detect the text-containing region
- Extract the text using OCR
- Translate it from Hindi to English or vice versa
- And finally, display the translated text

Workflow pipeline:

1. **Image upload** – User uploads any image that contains Hindi or English text.
2. **Choose the model** - User chooses the model for English to Hindi or vice versa.
3. **Text detection** – The system locates the region in the image containing text using OCR.
4. **Text extraction** – Detected regions are parsed to extract the raw text.
5. **Language detection** – The system identifies whether the text is in Hindi or English.

6. **Translation** – Based on the selected model and detected language, the text is translated to the other language.
7. **Output display** – Final output is shown alongside the original image.

Performance analysis:

- ***Where the model worked well:***

  Clean and clear images: When the text was printed clearly on a simple background, extraction and translation worked nicely.

  Good contrast: If the text color stood out from the background, OCR picked it up easily.

  Standard fonts: Printed materials like signs or banners gave better results.

- ***Where the model struggled:***

  Noisy or cluttered images: Background noise or overlapping objects confused the OCR.

  Fancy or handwritten fonts: Decorative Hindi/English fonts or slanted writing caused recognition issues.

  Low quality images: Blurry text often couldn't be extracted correctly.

  Mixed languages: Sometimes an image had both Hindi and English text, which confused the language detection step.

  Meaning translation: Sometimes the converted text i.e., Hindi to English or vice versa, did not mean the same thing as they did in the original language. Also in some cases, the positioning of the words was not proper. Also, cannot pick up short cut for the words (eg: iky (I know you))

  Number of words: Difficulty in translating properly if many words on the image.

Example images:

Uploaded Image

Model Selected:

Hindi to English

Translated Output

Extracted text from Input: शिक्षा

Translated Output: education

Uploaded Image

Model Selected:

Hindi to English

Translated Output

Extracted text from Input: ऐसी वाणी बोलिए

Translated Output: Speak in such a way

Uploaded Image

Model Selected:

Hindi to English

Translated Output

Extracted text from Input: गुरु के प्राधिकअक्मा विना ज्ञान की

Translated Output: without the knowledge of the Guru.

Uploaded Image

Model Selected:

English to Hindi

Translated Output

Extracted text from Input: english

Translated Output: अंग्रेजी

Uploaded Image

Model Selected:

English to Hindi

Translated Output

Extracted text from Input: never be afraid

Translated Output: कभी भी भयभीत न हों

Uploaded Image

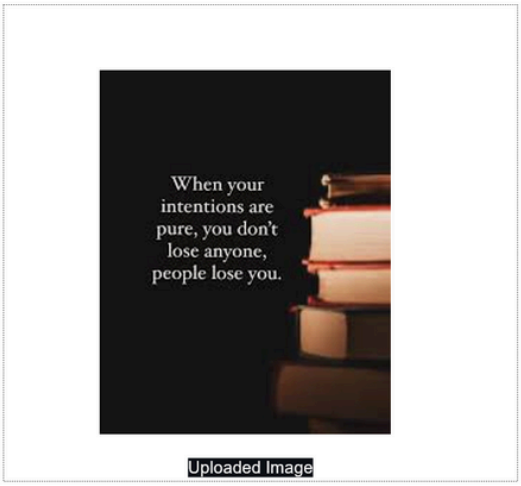
Model Selected:

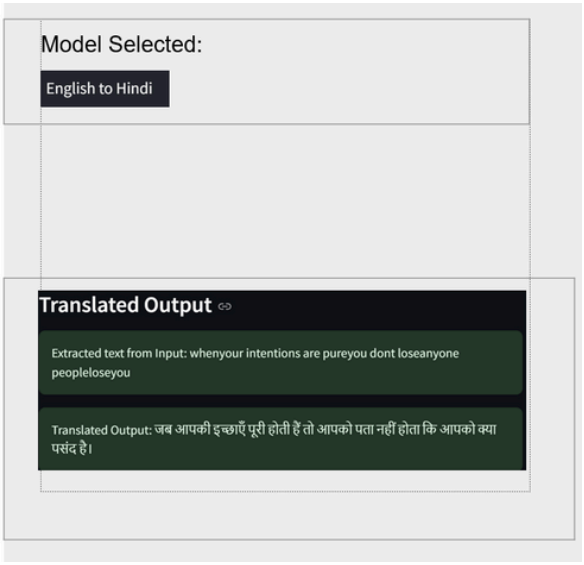
English to Hindi

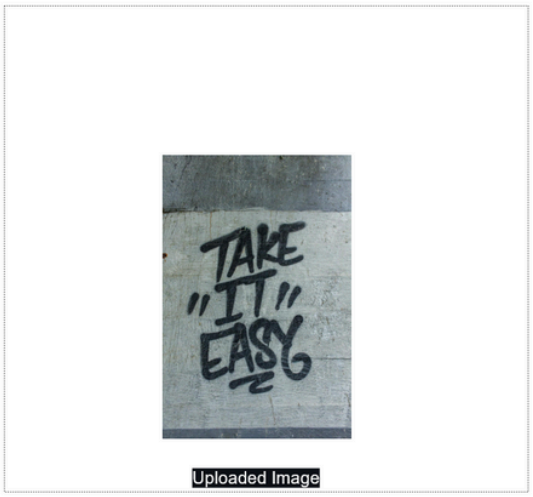
Translated Output

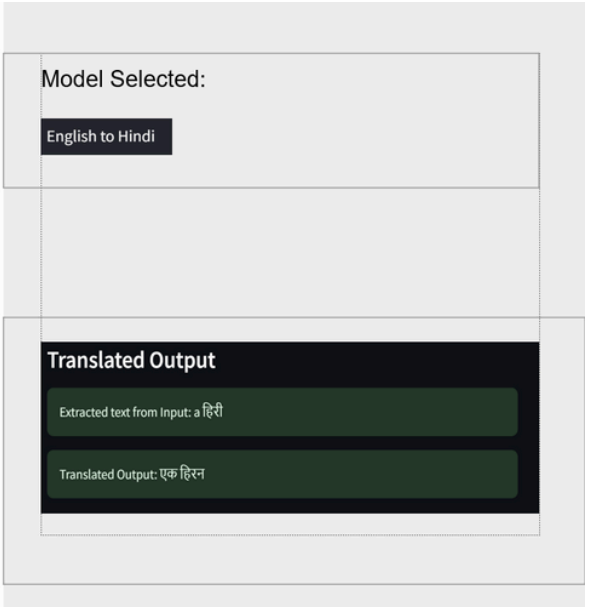
Extracted text from Input: unique pure language consultants

Translated Output: अद्वितीय शुद्ध भाषा सलाहकार

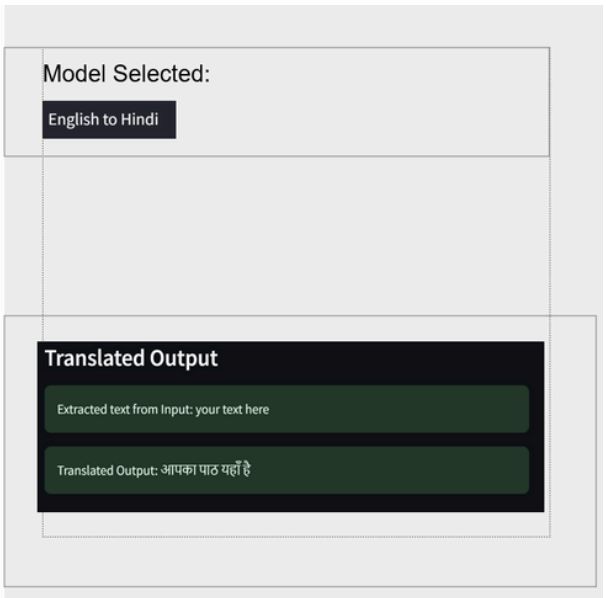

When your intentions are pure, you don't lose anyone, people lose you.
Uploaded Image


Model Selected:
English to Hindi
Translated Output
Extracted text from Input: whenyour intentions are pureyou dont loseanyone peopleloseyou
Translated Output: जब आपकी इच्छाएँ पूरी होती हैं तो आपको पता नहीं होता कि आपको क्या पसंद है।


TAKE "IT" EASY
Uploaded Image


Model Selected:
English to Hindi
Translated Output
Extracted text from Input: a हिरी
Translated Output: एक हिरन


Your Text Here
Uploaded Image


Model Selected:
English to Hindi
Translated Output
Extracted text from Input: your text here
Translated Output: आपका पाठ यहाँ है

Learnings:

We learned how Optical Character Recognition (OCR) works to detect and extract text from images and how translating that text automatically can bridge language gaps. We also realized the challenges of dealing with noisy or unclear images. We also understood the importance of having a large number of high quality labeled images for training the model. We also discussed how language detection is done and how difficult it is to translate between languages automatically, especially when handling mixed or non-standard texts.