AI detector with frontend interface

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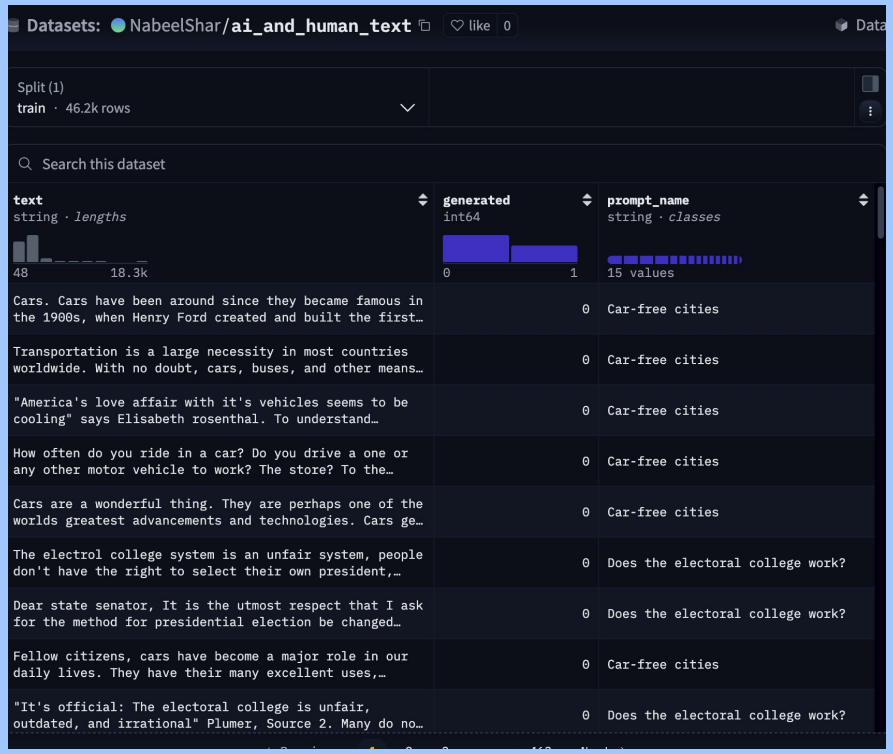
1. Uses a technology called DistilBERT - a compact AI model that understands language
2. This model has been trained to recognize differences between human and AI writing styles
3. It's like a language detective that spots subtle patterns most people miss
4. Similar to how you might recognize a friend's writing style, but much more precise

Trained on https://huggingface.co/datasets/NabeelShar/ai_and_human_text



Getting a quality dataset that had good examples, lots of data, and thus prevented overfitting took three tries. This was my third dataset and script.

Model trained on google Collab

Aidetector3.ipynb

File Edit View Insert Runtime Tools Help

Commands + Code + Text

Files

Connecting to a runtime to enable file browsing.

```
[ ]
print("\nTraining model...")
start_time = time.time()
trainer.train()
training_time = time.time() - start_time
print(f"\nTraining completed in {training_time/60:.2f} minutes")
```

```
Initializing model...
Some weights of DistilBertForSequenceClassification were not initialized from the model che
You should probably TRAIN this model on a down-stream task to be able to use it for predict

Training configuration:
Steps per epoch: ~2312
Evaluation every 462 steps
Logging every 231 steps

Training model...
[2313/2313 41:39, Epoch 1/1]
```

Step	Training Loss	Validation Loss	Accuracy	F1	Precision	Recall
462	0.084600	0.083154	0.980973	0.975309	0.958104	0.993143
924	0.051300	0.032902	0.992216	0.989708	0.990275	0.989143
1386	0.027900	0.024363	0.993946	0.991995	0.992563	0.991429
1848	0.025200	0.036889	0.992649	0.990341	0.984746	0.996000
2310	0.024900	0.028795	0.992865	0.990622	0.985302	0.996000

```
Training completed in 41.68 minutes
```

```
[ ]
# Evaluate the model on validation set
print("\nEvaluating model on validation set...")
eval_results = trainer.evaluate()
```

The dataset is imported using a link of the hugging face dataset and opened up, processed, and the loss and other metrics are seen here.

Note: you can see the training script in full at the root directory of my project. It is called AIdetector.ipynb

- The model doesn't read words like we do - it breaks text into smaller pieces called "tokens"
- For example, "unbelievable" becomes three pieces: "un" + "believe" + "able"
- This helps it understand parts of words and handle words it hasn't seen before
- Every token gets converted to a number that the AI can process

Tokenization

Tokenization Visualization

See how the DistilBERT tokenizer processes your text

Text Tokenization

3 tokens / 2 words

Complete Token Sequence (with special tokens)

[CLS]	testing	token	##ization	[SEP]
101	5604	19204	3989	102

How DistilBERT Tokenization Works:

1. Special tokens like [CLS] and [SEP] are added at the beginning and end
2. Words are split into subwords (tokens) based on frequency
3. Tokens starting with "##" are continuations of the previous word
4. Each token is assigned a numeric ID from the vocabulary
5. These token IDs are what the model actually processes

Reset

The AI can only look at 512 tokens (roughly 300-400 words) at once
For longer texts, we use a "sliding window" approach:

- Break the text into overlapping chunks
- Analyze each chunk separately
- Combine the results to get the final answer

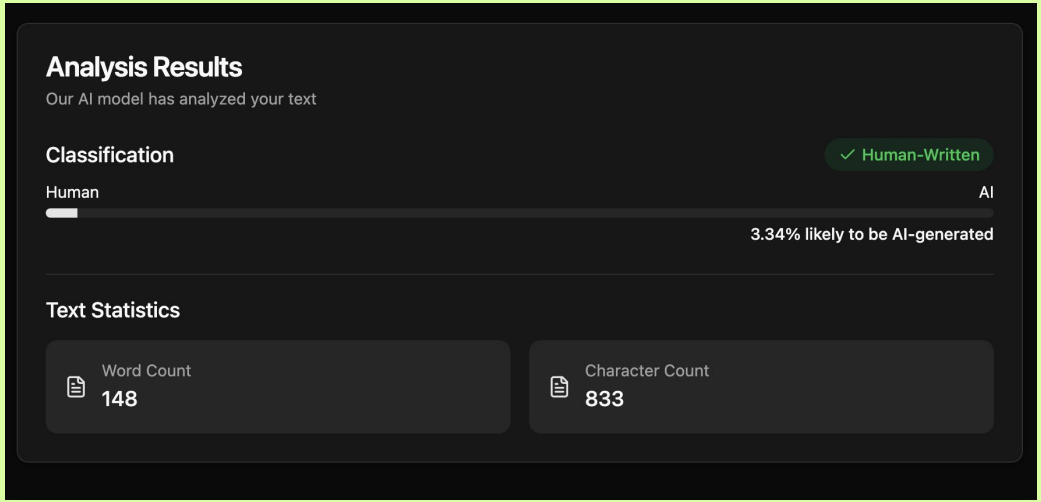
Like reading a book by examining overlapping pages rather than the whole book at once
The overlaps are 256 tokens

This is due to the nature of the model - you must input an exact length.

Shorter ones have tokens added to them.

512 token input and larger inputs

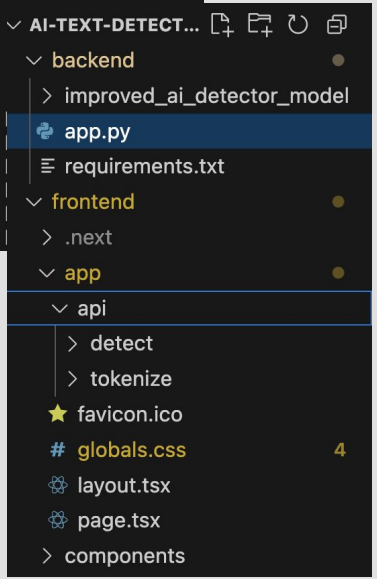
The system doesn't just give a yes/no answer - it tells you how confident it is
A result might be "85% likely to be AI-generated"
I adjust this confidence using a "temperature" setting to make it more reliable
Higher confidence means the AI is more certain about its decision



Flask handles requests from users
When you submit text, it:

Prepares the text for the AI model
Runs the model to get a prediction
Calculates confidence scores
Sends results back to the website

```
(base) christopher@b01-aruba-authenticated-10-110-200-80 backend % pytho
Loading improved model...
Model loaded successfully on cpu!
 * Serving Flask app 'app'
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production dep
SGI server instead.
 * Running on http://127.0.0.1:5000
Press CTRL+C to quit
 * Restarting with watchdog (fsevents)
Loading improved model...
Model loaded successfully on cpu!
 * Debugger is active!
 * Debugger PIN: 105-220-697
127.0.0.1 - - [15/Apr/2025 11:53:20] "POST /api/detect
127.0.0.1 - - [15/Apr/2025 11:53:31] "POST /api/detect
127.0.0.1 - - [15/Apr/2025 11:53:31] "POST /api/detect
127.0.0.1 - - [15/Apr/2025 11:53:51] "POST /api/detect
127.0.0.1 - - [15/Apr/2025 11:53:53] "POST /api/detect
127.0.0.1 - - [15/Apr/2025 11:53:57] "POST /api/detect
```



All the heavy AI processing happens here

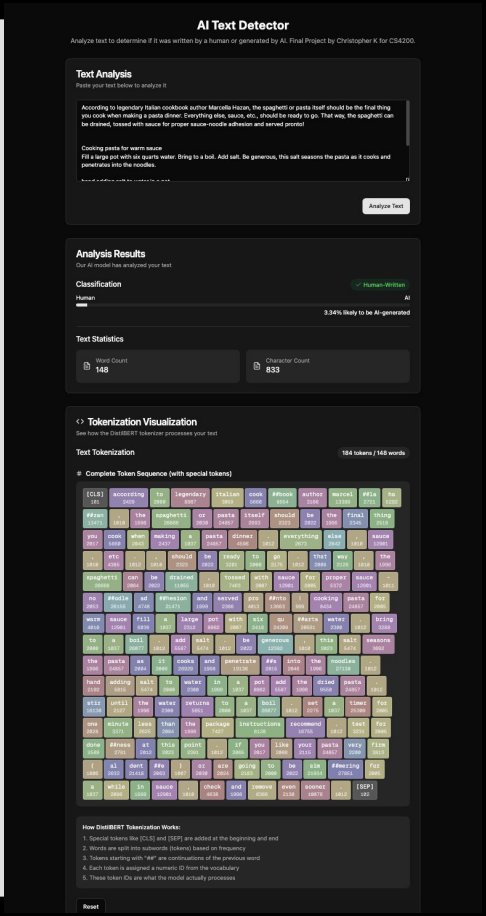
There is also the tokenization route and logic

Backend

Built using modern web technology (Next.js)

- Features a simple text input box where you paste your text
- Shows results with easy-to-understand visuals
- Includes educational sections that explain how AI detection works
- Api routing in the api/ folder handles forwarding the requests to the flask backend

Frontend



Setting up the AI part:

Install Python on your computer
Download the project files
Open a command window and type: cd backend
Install required programs: pip install -r requirements.txt
Start the AI server: python app.py

Setting up the website:

Install Node.js on your computer
Open a new command window and type: cd frontend
Install website components: npm install
Start the website: npm run dev
Open your web browser to: http://localhost:4000

Setup

http://localhost:4000

https://github.com/christopherk26/ai-text-detector

Human text:
https://feelgoodfoodie.net/recipe/how-to-cook-pasta/

AI text:

Link and demo

- Learned about LLMs, tokenization, NN's
- Realized that quality ai detectors are hard to make in general and are easy to trick
- Ai detectors in general are not very good (tried other ones online)
- What does this mean for the state of the internet (dead internet theory?)

Takeaways

Thanks!


Christopher
Planeswalker — Christopher
+1: Scry 1, then draw a card.
−2: Christopher deals 3 damage to any target.
−6: Draw four cards.
4
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