

QUICK, DRAW DOODLE CLASSIFIER!

Inspired by "Quick, Draw!", our project develops an AI to classify hand-drawn doodles. We focus on a **Convolutional Neural Network (CNN)** to interpret complex **visual features** within these sketches. Ultimately, our goal is to build a highly accurate and deployable doodle recognition system.

MEMBERS

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INTRODUCTION

Every day, people communicate through simple drawings and sketches—a universal language that we instantly understand.

But how can we teach a machine this intuitive human skill?

Inspired by the engaging challenge of Google's "Quick, Draw!" game, this project ventures into the core of machine perception. Our motivation is to move beyond just building a classifier; we aim to explore how an AI can learn to interpret the subtle features and creative variations inherent in hand-drawn doodles, bridging the gap between human expression and machine intelligence.

DATASET USED

QUICK DRAW by Google with contributions over 15 million users.

MODEL USED

- **Core Model:** Used a Convolutional Neural Network (CNN) in TensorFlow/Keras, ideal for image feature learning.
- **Development:** Designed and optimized the CNN through iterative experiments in Jupyter Notebooks.
- **Training:** Fed millions of 28x28 doodle images to the network, teaching it to recognize complex patterns hierarchically.
- **Deployment:** Converted the trained model to TensorFlow.js for a live, real-time web-based doodle classification demo.

FUTURE SCOPE

- Improve accuracy with deeper architectures (e.g., ResNet, MobileNet).
- Use stroke-sequence data (vector input) instead of static bitmaps for better temporal understanding.
- Implement data augmentation (rotation, scale jittering) to improve generalization.
- Integrate with creative tools (drawing apps, educational games).



METHODOLOGY

1. **Data Preparation:** Used the Quick, Draw! dataset (345 classes) converted into 28×28 grayscale images and split into training and testing sets.
2. **Model Training:** Built and trained a CNN with convolutional, pooling, dropout, and dense layers using TensorFlow to classify doodles.
3. **Deployment:** Converted the trained model to TensorFlow.js for real-time browser-based doodle recognition with an interactive drawing interface.

Doodle Classifier with 345 Classes

A doodle classifier(CNN) trained on 345 classes from [Quickdraw dataset](#)

guess clear



I see:
lighthouse (10%),
microphone (9%),
streetlight (8%),
flashlight (6%),
matches (6%),
palm_tree (5%),
broccoli (5%),
knee (4%),
candle (3%),
fork (2%)

Doodle Classifier with 345 Classes

A doodle classifier(CNN) trained on 345 classes from [Quickdraw dataset](#)

guess clear



I see:
spider (57.99999999999999%),
beach (12%),
sun (9%),
alarm_clock (5%),
crab (3%),
moon (2%),
ocean (2%),
light_bulb (1%),
animal_migration (1%),
lantern (1%)

The Interface of Our Project

CONCLUSION

1. DoodleNet successfully classifies human doodles using a Convolutional Neural Network (CNN) trained on Google's Quick, Draw! dataset (345 classes, ~17 million images), achieving around **70–78% accuracy**, comparable to human performance.
2. The model learns visual patterns — from basic strokes to complex shapes — and is deployed in-browser using TensorFlow.js, enabling real-time, interactive sketch recognition.
3. The project demonstrates the power of deep learning for creative AI, showing how CNNs can interpret abstract human drawings and inspiring future improvements through deeper models, stroke-based data, and real-world applications.

