



NTI AI PROJECT

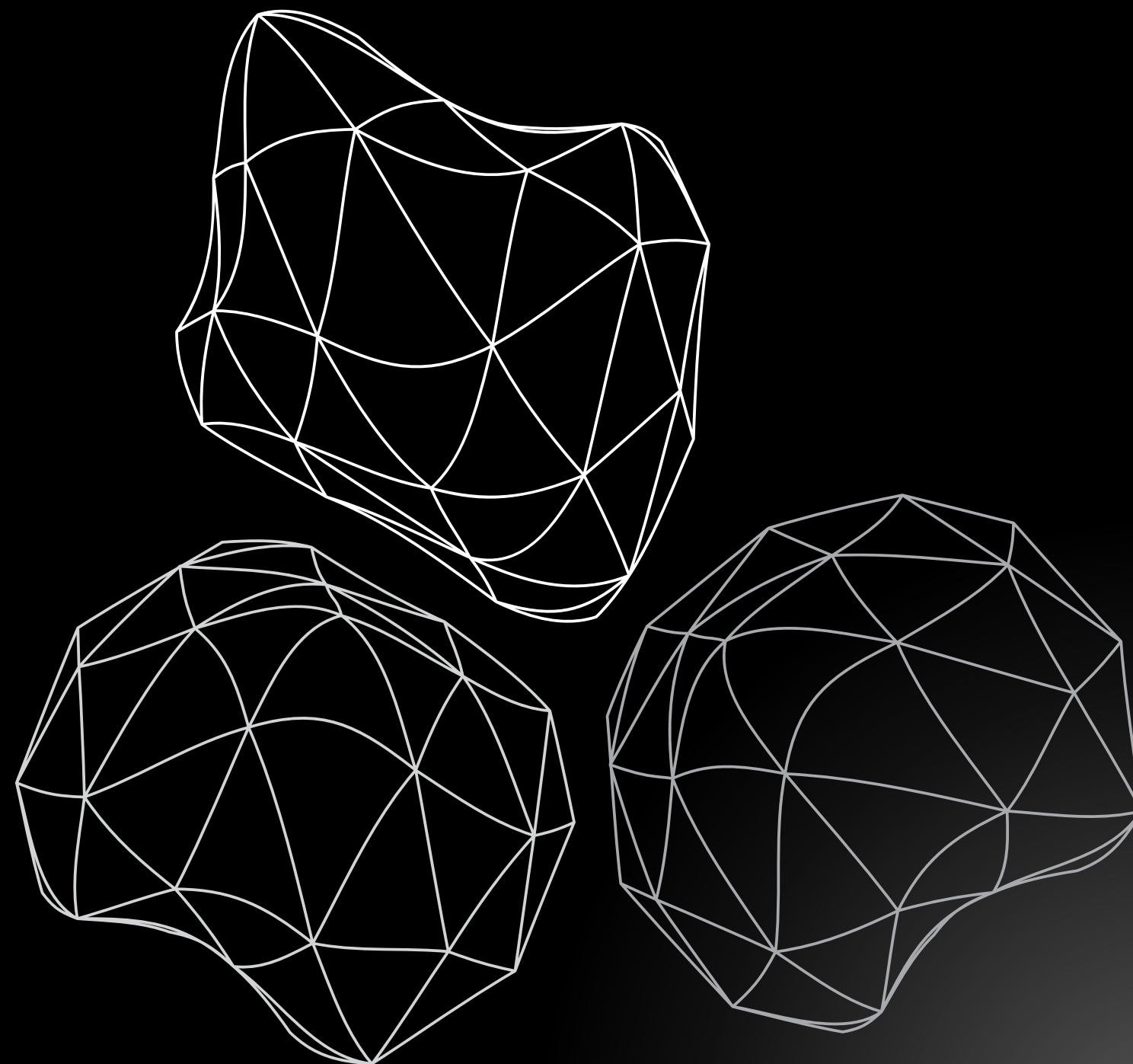
AUTO ML STUDIO

Presented by Mohamed Omar

Instructor: DR/ Elhossiny

Agenda

- The Problem: The barrier to entry for ML
- Our Vision: Democratizing Machine Learning
- What is AutoML Studio? Your end-to-end solution
- Live Demo: See the magic in action
- Technical Highlights & Architecture
- Impact & Future Roadmap

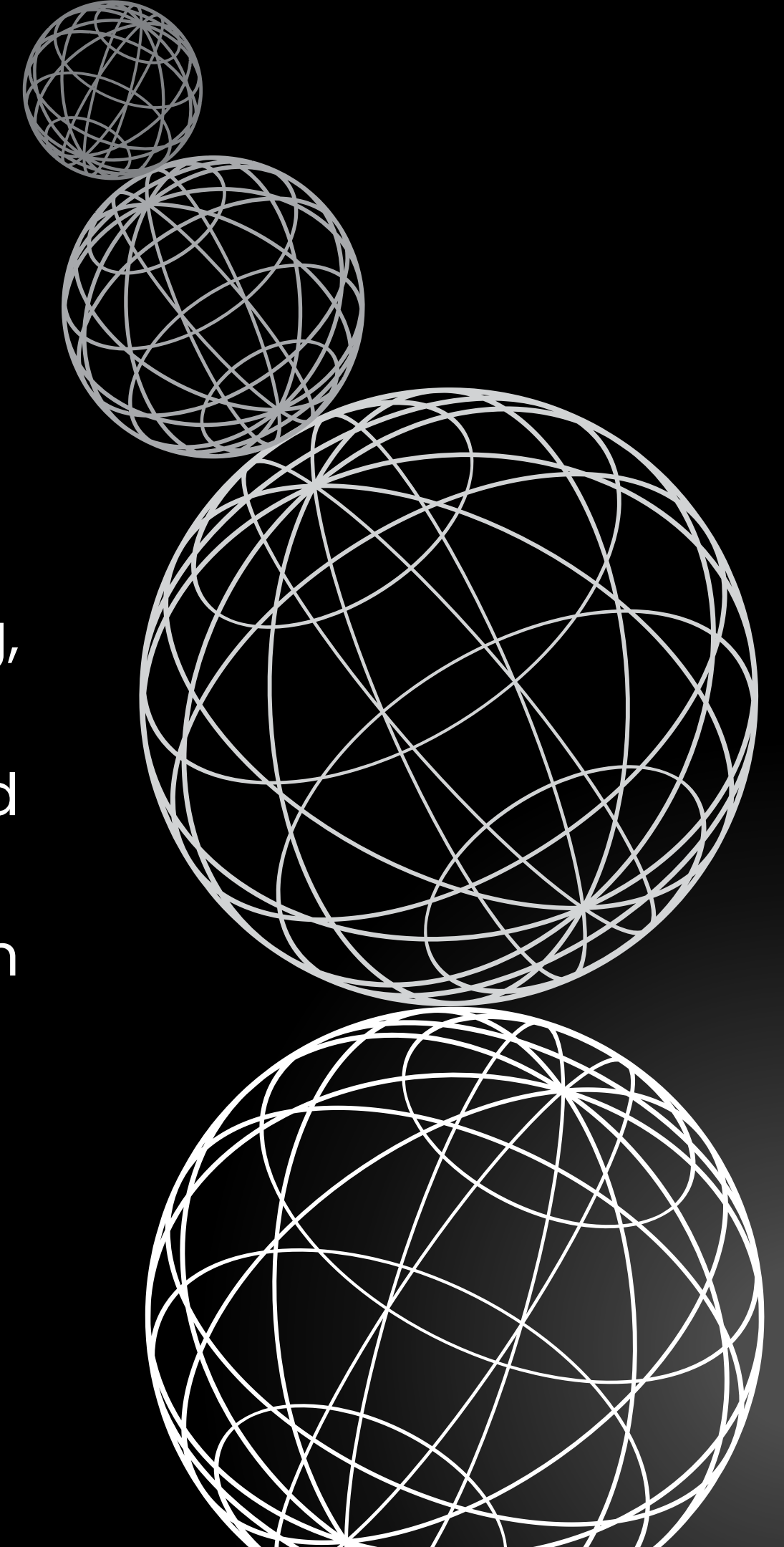


THE PROBLEM

Machine Learning Shouldn't Be This Hard

- Steep Learning Curve: Requires deep expertise in coding, statistics, and math.
- Time-Consuming: Data cleaning, model training, and tuning are slow, repetitive tasks.
- The Accessibility Gap: A chasm exists between domain experts and the power of ML.
- Bottleneck: Valuable insights are stuck in the pipeline.

"I need results, not a PhD in Data Science."



OUR VISION

Democratizing Machine Learning

We believe the transformative power of AI should be accessible to everyone.

AutoML Studio is built on a simple principle:

Focus on your problem, not the complex tools.

We remove the technical barriers, allowing:

- Analysts to predict trends.
- Developers to prototype faster.
- Students to learn by doing.
- Domain Experts to leverage their data.





WHAT IS AUTOML STUDIO?

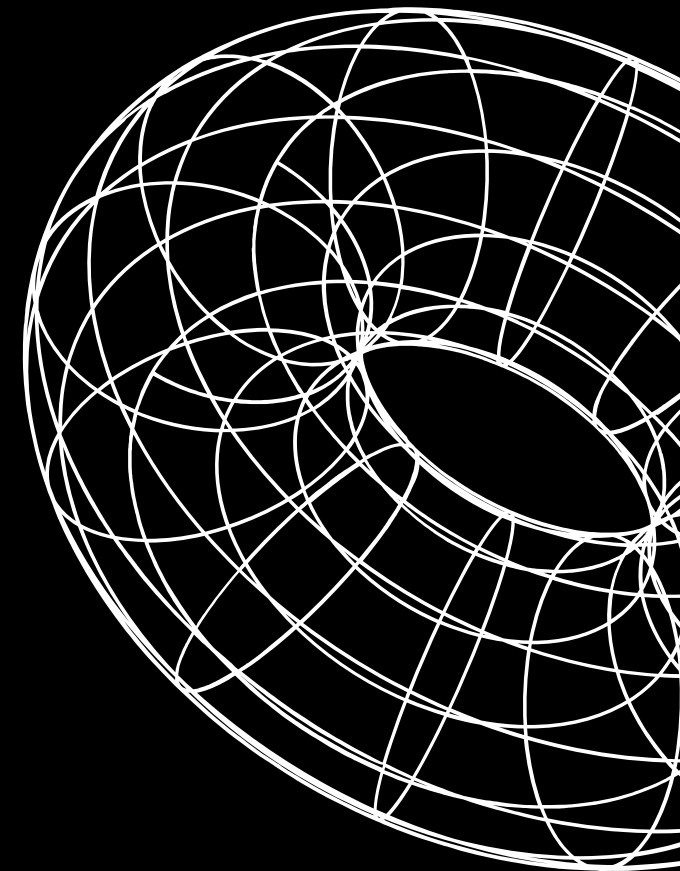
No code required. Just results.

Your End-to-End ML Solution, Simplified

AutoML Studio is an intuitive web platform that automates the entire machine learning workflow—from raw data to a trained model—with just a few clicks.

It's a powerful toolbox that provides:

-  Smart Data Analysis & Cleaning
-  Automated Visualization
-  Intelligent Model Training & Selection
-  One-Click Image Recognition



Data Information

Upload your dataset to analyze its structure, statistics, and quality.

Upload Dataset



Choose CSV File

☒ File has header row

 Upload & Analyze



No Data Uploaded

Upload a CSV file to see detailed data information and quality metrics.

AutoML Studio

Advanced Automated Machine Learning Platform



Quick Links

- Data Analysis
- Visualization
- Model Training
- Image AI

Resources

- Documentation
- API Reference
- Examples
- Support

Company

- About Us
- Privacy Policy
- Terms of Service
- Contact

CORE FEATURES

Everything You Need, Built Right In

1

Data Analysis & Cleaning

- Automatically profile your data.
- Handle missing values & encode categories.
- Visual: Icon of a data table with a checkmark.

2

Automated Visualization

- Generate interactive charts instantly.
- Explore relationships with drag-and-drop.
- Visual: Icon of a bar chart/line chart.

3

Smart Model Training

- Train multiple powerful models at once.
- Automatically select & tune the best one.
- Visual: Icon of a robot or a brain.






4

Image Recognition

- Classify images using state-of-the-art AI.
- Get instant predictions with confidence scores.
- Visual: Icon of an eye or a camera.

HOW IT WORKS

From Data to Insights in Minutes

1.  Upload Your Data (CSV)
2.  Explore & Clean (Auto-Preprocessing)
3.  Visualize (Understand Patterns)
4.  Train (AutoML Engine Finds Best Model)
5.  Evaluate & Download (Get Results & Model)

A seamless, guided pipeline. You're always in control.

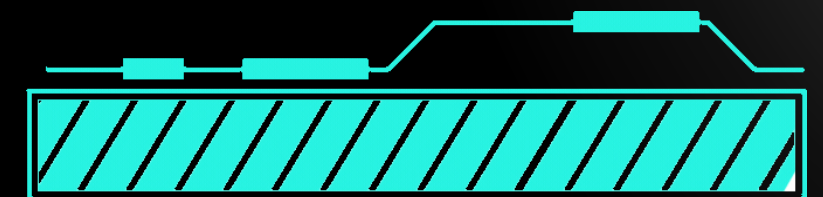
BEHIND THE SCENES

Smart Automated Preprocessing

Your data is transformed automatically, ensuring accurate models.

- Handles Missing Data: Intelligently fills gaps using smart imputation.
- Encodes Categories: Converts text (e.g., "Country") into numbers models understand.
- Normalizes Values: Scales features fairly to prevent bias.
- Detects Issues: Identifies potential problems like constant columns.

You get clean, model-ready data without writing a single line of code.



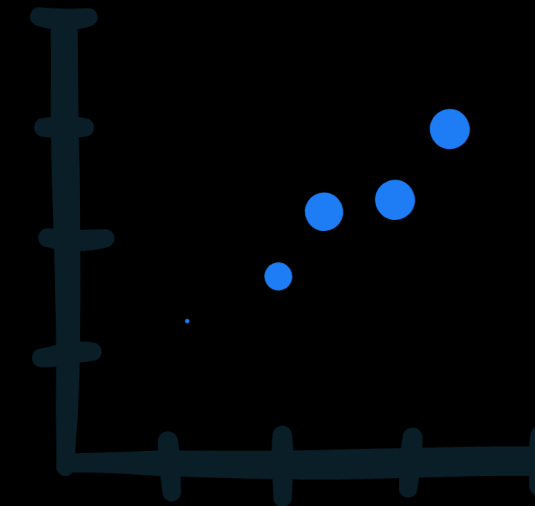
THE TRAINING ENGINE

A Competition of Champions

We don't guess which model is best—we test them.

Our platform runs a parallelized competition between multiple top-performing algorithms:

- Random Forest
- XGBoost
- LightGBM
- Gradient Boosting
- ...and more



The best model is selected based on accuracy, then automatically fine-tuned for peak performance. This ensures you always get the best possible results for your specific data.

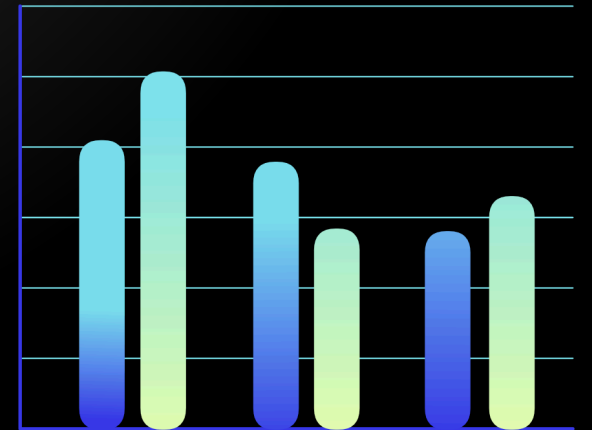
A QUICK LOOK

Understanding Your Data at a Glance

Get a comprehensive overview of your dataset instantly.

- Shape & Size: See row and column counts immediately.
- Data Quality Report: Check completeness and data types.
- Correlation Heatmap: Visualize relationships between variables instantly.

This deep understanding is the critical first step toward building a powerful model, and it's done for you automatically.



DEMO PHASE 1

Upload & Instant Analysis

The journey begins by uploading your dataset.

- Drag & drop a CSV file into the platform.
- Our system instantly analyzes the data structure.
- You get an immediate overview: size, quality, and potential issues..

Within seconds, you know what you're working with. No more guessing about data shape or missing values.

Data Information

Upload your dataset to analyze its structure, statistics, and quality.

Upload Dataset



Social_Network_Ads.csv

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 Upload & Analyze



No Data Uploaded

Upload a CSV file to see detailed data information and quality metrics.

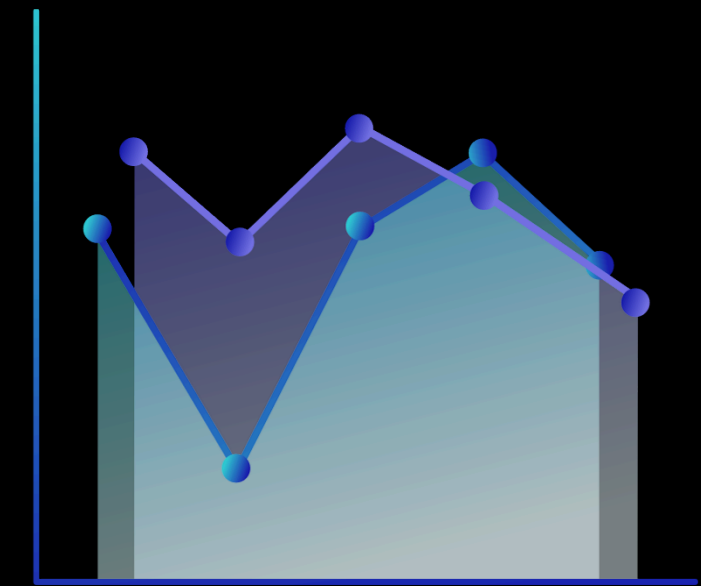
DEMO PHASE 2

Visual Exploration Made Easy

Unlock insights with powerful, interactive charts.

- Automatic Plots: Get a histogram for every numeric column instantly.
- Custom Analysis: Build scatter plots, box plots, and bar charts with a simple dropdown interface.
- Discover Patterns: Identify trends, outliers, and relationships visually.

This isn't just pretty pictures—it's a critical step for informed feature selection and model understanding.



Data Information

Upload your dataset to analyze its structure, statistics, and quality.

Upload Dataset



Social_Network_Ads.csv

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 Upload & Analyze

Dataset Overview



400

Rows



5

Columns



0

Missing Values



4

Numeric Columns

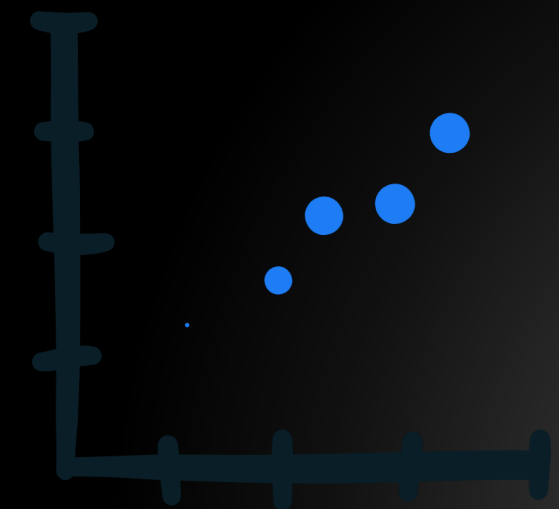
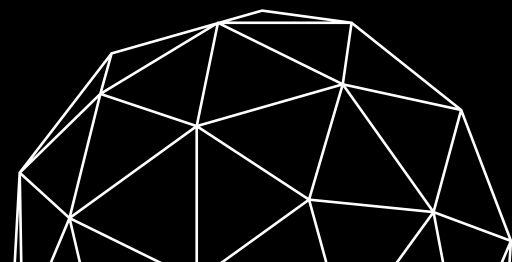
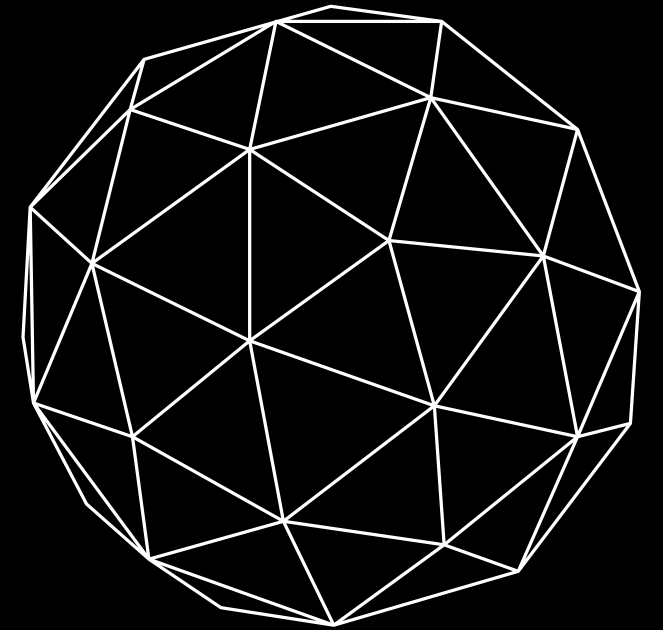
DEMO PHASE 3

One Click to Train

The moment of magic. Transforming data into a predictive model.

- Simply select the target variable you want to predict.
- Click "Start Training".
- Our engine takes over, running the model competition in the background.

You've just initiated a complex process that would normally take hundreds of lines of code. Here, it takes one click.



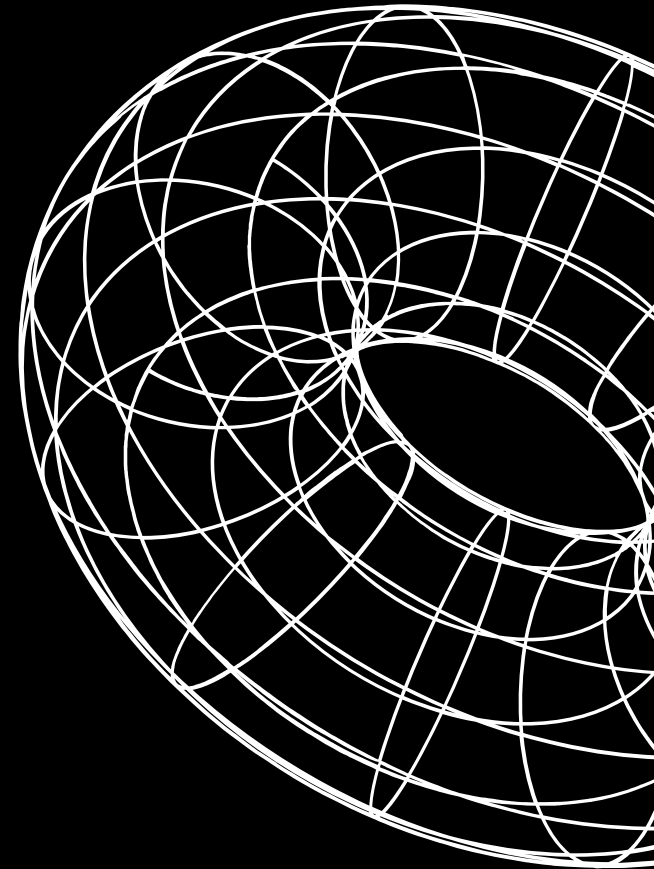
DEMO PHASE 4

Transparent, Actionable Results

We don't just give you a model—we give you confidence.

- Model Leaderboard: See a clear comparison of all trained algorithms.
- Performance Metrics: Understand how each model scored (Accuracy, Precision, RMSE, R^2).
- The Champion: The best model is automatically selected and highlighted.
- Take Action: Evaluate, save, or deploy your winning model with one click.

This transparency allows you to trust the outcome completely.



Data Information

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Upload Dataset



insurance.csv

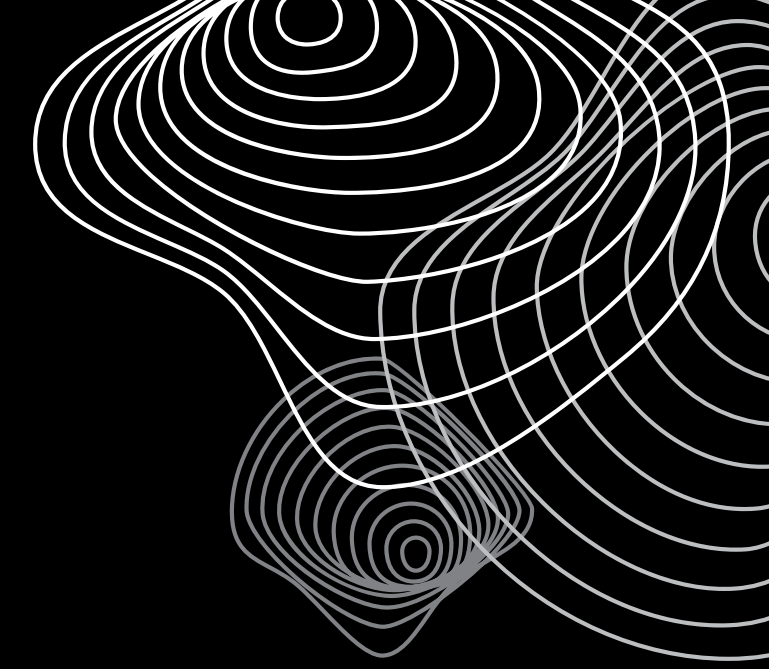
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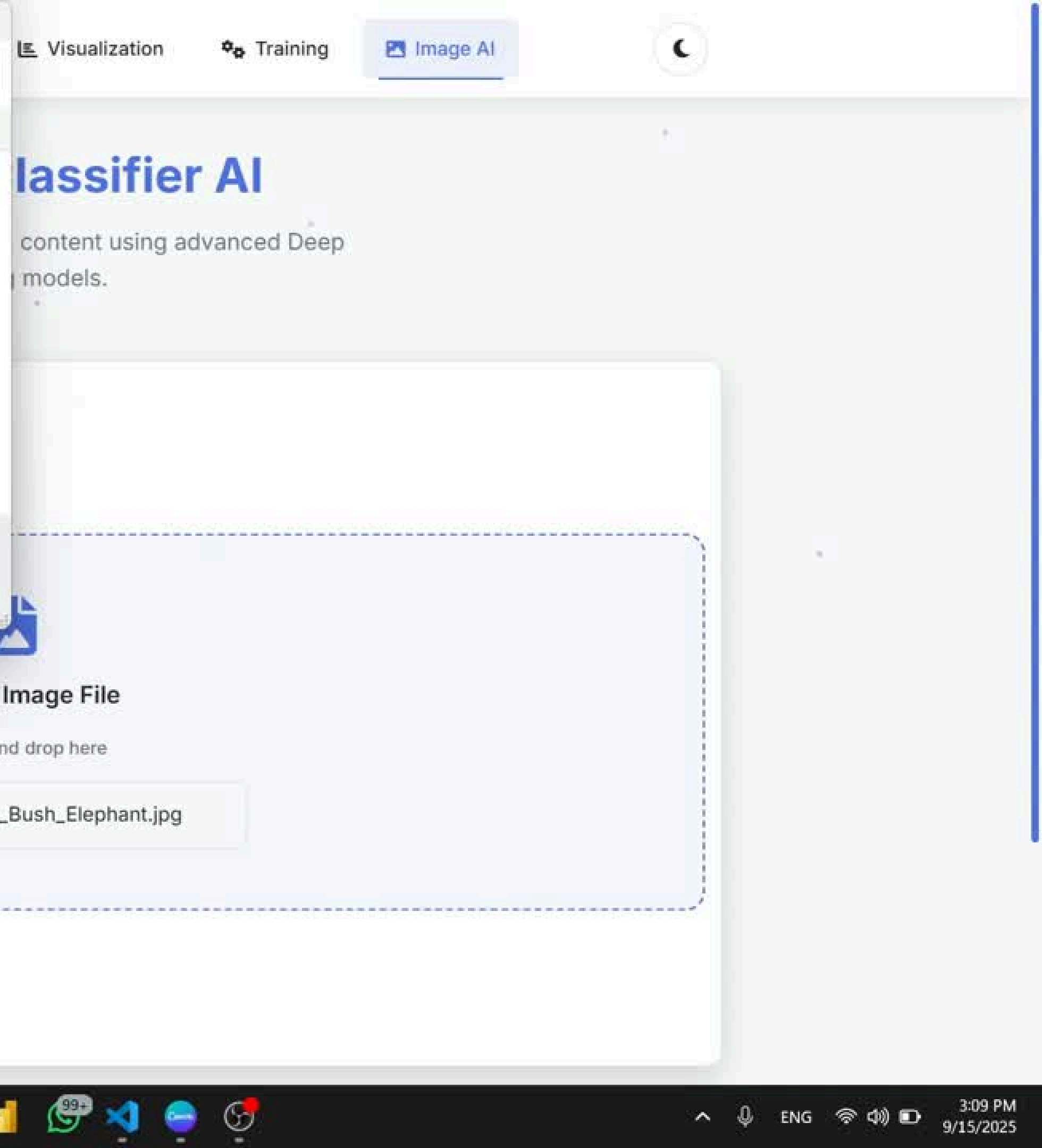
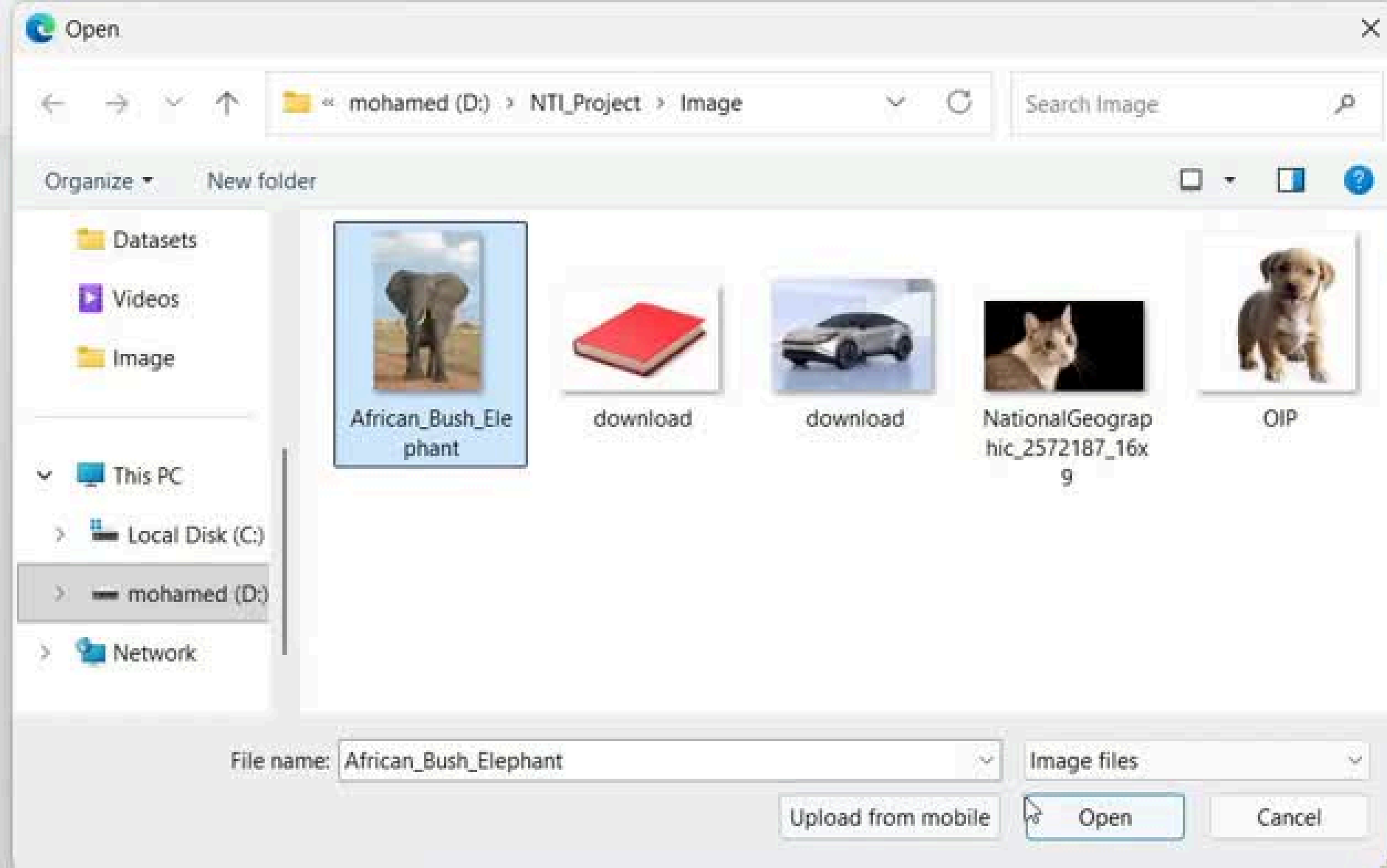
BEYOND TABULAR DATA

Instant Image Classification

The power of deep learning, simplified

- Upload any image.
- Our system uses a powerful pre-trained deep learning model (MobileNet) to analyze it.
- Get instant predictions with a detailed confidence score.
- Perfect for prototyping computer vision applications without the complexity.

From spreadsheets to pictures—our platform handles it all.



TECHNICAL ARCHITECTURE

Powering Simplicity with Robust Technology

Frontend (The Interface):

- Flask: Lightweight web framework for handling requests.
- HTML/CSS/JS: Creates a dynamic, interactive user experience.
- Plotly: Generates beautiful, interactive visualizations.

Backend (The Brain):

- Pandas/NumPy: For robust data manipulation and analysis.
- Scikit-learn: The workhorse for traditional ML models.
- XGBoost/LightGBM: For state-of-the-art gradient boosting.
- TensorFlow/Keras: Powers the image classification (MobileNetV2).

DESIGNED FOR PERFORMANCE & SPEED

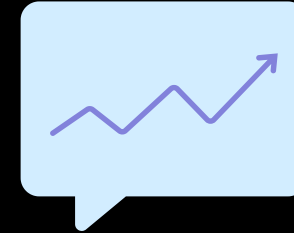
Smart Engineering Choices

We've optimized the entire pipeline for a fast user experience:

- **Parallel Model Training:** Trains multiple models simultaneously using `n_jobs=-1` to utilize all CPU cores.
- **Efficient Data Handling:** Smart sampling for large datasets to reduce wait times during experimentation.
- **Early Stopping:** For advanced models, stops training early if no improvement is detected, saving precious time.
- **Model Selection:** A curated selection of 6 top-performing algorithms ensures quality without unnecessary bloat.

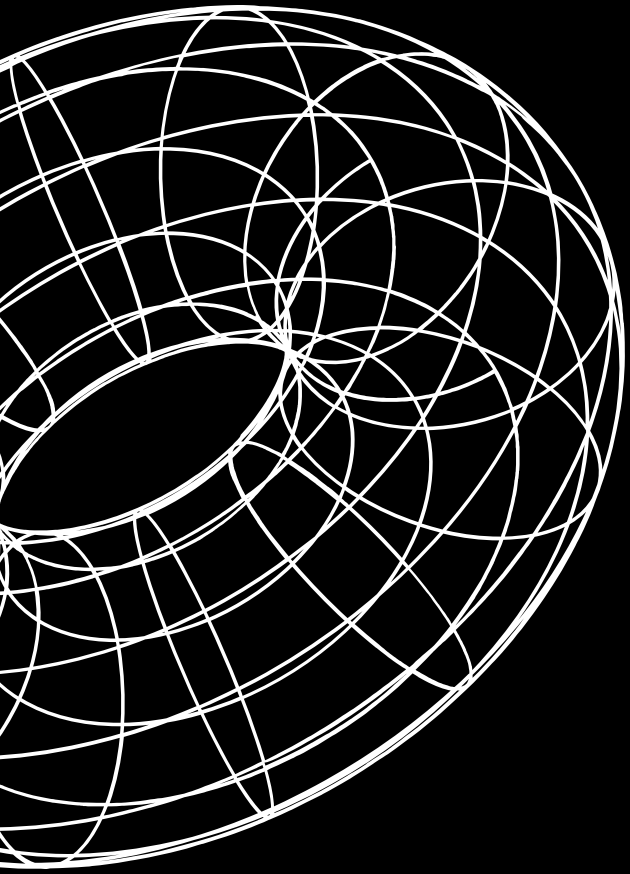
WHAT'S NEXT?

Our Vision for the Future



We're constantly evolving to make AutoML Studio even more powerful:

- **Model Deployment:** One-click deployment to cloud platforms (AWS, GCP, Azure).
- **Enhanced Data Sources:** Direct connections to databases (SQL, BigQuery) and cloud storage.
- **Object Detection:** Go beyond classification; identify and locate objects within images.
- **Time Series Forecasting:** Specialized support for predicting trends over time.

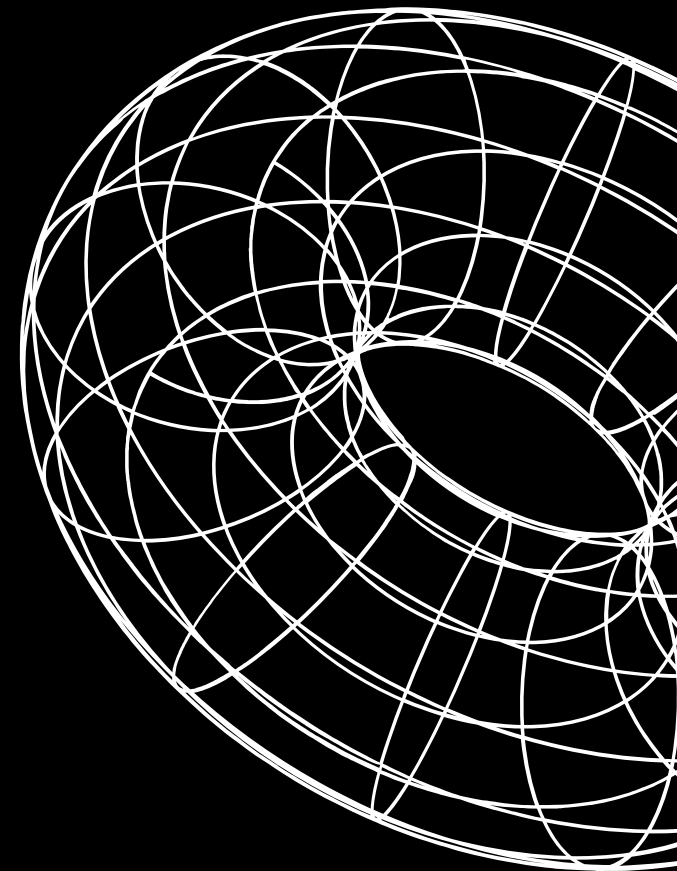


CONCLUSION

Machine Learning, Made Accessible

**AutoML Studio removes the complexity and
brings you the power of ML instantly.**

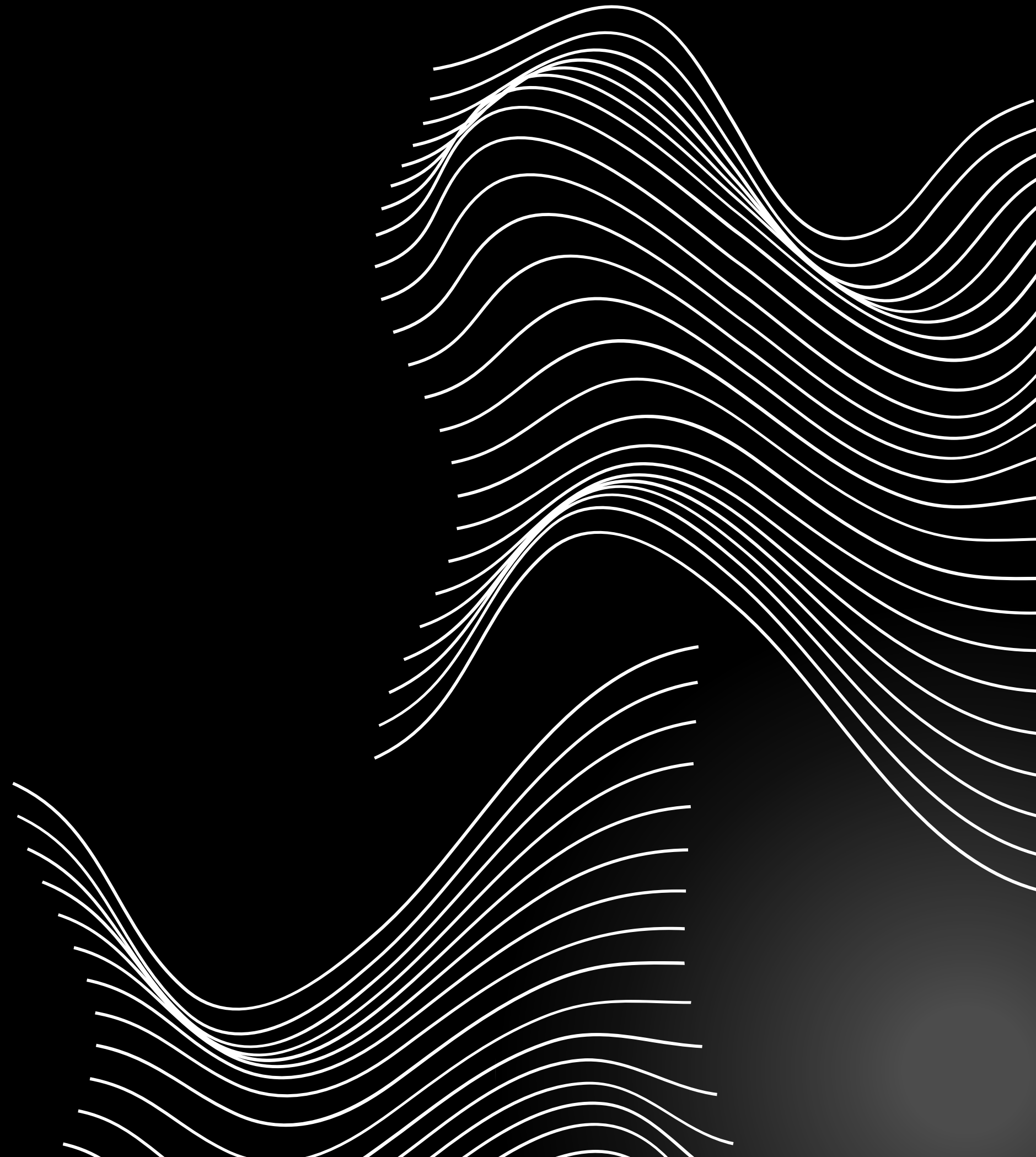
Upload your data. Get your model. It's that simple



CONTACT US

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[LinkedIn](#)



The background is a dark gradient, transitioning from a very dark grey at the top to a slightly lighter grey at the bottom. Overlaid on this are several intricate, white, wavy line patterns. These patterns consist of many closely spaced, slightly curved lines that create a sense of depth and movement, resembling liquid or smoke. One large pattern is in the top right corner, another is in the bottom left corner, and a third is on the right side, partially obscured by the text.

THANK YOU