# 🎛️ Response Surface Modeling (RSM) — Streamlit App (Execution Guide)

Developed By: Ravindra Gantasala — Senior Data Scientist / NLP Engineer  
Project: ANN-based Response Surface Modeling Visualization  
Version: 1.0  
Date: October 2025

## 1️⃣ What This App Does

This Streamlit dashboard allows you to:  
- Visualize Response Surface Models (RSM) built using a trained ANN model.  
- Select any two input features (X, Y) and target output (Z) interactively.  
- Generate contour (RSM) plots, error donut charts, and synthetic vs. actual prediction comparisons.  
- Dynamically adjust feature ranges using sliders to see how the ANN model behaves across the design space.

## 2️⃣ Files You’ll Receive

RSM\_App/  
├── app.py  
├── requirements.txt  
├── H\_vs\_Tau\_training.xlsx  
├── H\_vs\_Tau\_target.xlsx  
├── synthetic\_tau\_98.xlsx  
├── Copy of T33\_100\_Samples\_for\_testing.xlsx  
├── checkpoints/h\_vs\_tau\_best\_model.keras  
├── x\_eta\_scaler.pkl  
└── y\_eta\_scaler.pkl  
  
📁 Keep all these files in the same folder and do not rename them.

## 3️⃣ Install Anaconda (Python Environment Manager)

1. Visit https://www.anaconda.com/download  
2. Download the Anaconda Installer for Windows (Python 3.10 or higher)  
3. Run the installer → Install for All Users → Finish  
4. Once installed, open the Anaconda Prompt from the Start Menu.

## 4️⃣ Create Conda Environment

conda create -n rsm\_env python=3.10  
conda activate rsm\_env

## 5️⃣ Install Dependencies

cd "C:\Users\<yourname>\Downloads\RSM\_App"  
pip install -r requirements.txt

## 6️⃣ Run Streamlit App

streamlit run app.py  
Then open http://localhost:8501 in your browser.

## 7️⃣ How to Use

- Feature X / Feature Y: Select two input features  
- Target Output: Choose target variable  
- Sliders: Adjust feature ranges  
- Threshold: Define tolerance for matching synthetic vs. real data

## 8️⃣ Outputs

✅ Contour Plot (RSM): Smooth color gradient surface  
✅ Donut Charts: Global MAPE and Local Error  
✅ Data Table: Matched points with Actual, Predicted, and Error %

## 9️⃣ Troubleshooting

- ModuleNotFoundError: Run pip install -r requirements.txt  
- TensorFlow not found: pip install tensorflow==2.14.0  
- Path errors: Ensure all files are in same folder  
- Plotly property error: Remove 'titleside' from colorbar

## 🔟 Deployment (Optional)

1. Upload folder to GitHub  
2. Go to https://share.streamlit.io  
3. Deploy app.py → get live link  
Example: https://yourname-rsmapp.streamlit.app/

## 11️⃣ Command Summary

conda create -n rsm\_env python=3.10  
conda activate rsm\_env  
cd path\to\RSM\_App  
pip install -r requirements.txt  
streamlit run app.py  
CTRL + C to stop the app

## 12️⃣ Developer Info

Developed by: Ravindra Gantasala  
Role: Senior Data Scientist & NLP Engineer  
Organization: Wissen Infotech  
Focus Areas: Predictive Analytics, ANN, Streamlit Visualization  
Last Updated: October 2025