

WHAT IS AMOEBA?

Amoeba is an AI-powered design tool enabling designers to train custom AI models and generate diverse 3D geometries. It features three core components:

1. **Training Data Generation:** Creating structured, semantically annotated datasets for custom model training.
2. **LLM Fine-tuner:** Provides tools for training large language models to interpret user-defined prompts and produce 3D design outputs.
3. **AI-Driven Model Generation:** Utilizes a two-step AI pipeline to transform text inputs into 3D geometries.

Amoeba streamlines creativity and adaptability for tailored design solutions.

FEATURES

Training Data Generation

Amoeba provides tools to create structured, semantically annotated datasets. This step is essential for training custom AI models that understand your unique design language. While this may require additional steps outside of Grasshopper, Amoeba's integration ensures that once data is prepared, it can be used for model training seamlessly.

LLM Fine-tuner

Amoeba connects to a Large Language Model (LLM) fine-tuning service. You can train the model with your custom data so that it better interprets and responds to your prompts. This includes:

- Adjusting the model's understanding of your preferred aesthetic styles.
- Training it to respond more accurately to your use cases (e.g., furniture, architecture, automotive parts).

AI-Driven Model Generation

Amoeba uses a two-step AI pipeline:

1. **Natural Language Input:** You supply a prompt (e.g., "A comfortable lounge chair suitable for indoor use, with a minimalistic design").
2. **3D Geometry Output:** The plugin transforms the LLM interpretation into actual 3D geometry directly in Rhino.

SETUP AMOEBA

Installation and Setup

1. **Install Grasshopper:** Ensure you have Rhino and Grasshopper installed.
2. **Download Amoeba Plugin:** Obtain the latest release of the Amoeba Grasshopper plugin from the project's GitHub repository or other official source.
3. **Load the Plugin:** In Grasshopper, go to **File > Special Folders > Components Folder** and place the Amoeba .gha file into this directory. Restart Rhino and Grasshopper.

Getting an OpenAI API Key

Amoeba requires an OpenAI API key to function. Follow these steps:

1. **Create/Open Your OpenAI Account:** Go to the [OpenAI API Dashboard](#) and log in or sign up.
2. **Generate API Key:** Navigate to the "View API Keys" section and create a new secret key.
3. **Copy the Key:** Copy the generated API key to your clipboard.

** Keep this API key private and do not share it publicly.*

Configuring Amoeba in Grasshopper

1. **Open the Amoeba Component in Grasshopper:** Launch Rhino, open Grasshopper, and locate the Amoeba plugin components in the Grasshopper toolbar.
2. **API Key Field:** In the Amoeba parameters, find the dedicated API key input field.
3. **Paste Your API Key:** Enter your OpenAI API key into the key field.

Once done, Amoeba is ready to process your prompts.

USING AMOEBA

Amoeba's workflow is streamlined into a few simple steps.

Step 1: Define Your Prompt

In the Amoeba interface, locate the prompt input field. Here you can type a simple description of the model you want. For example:

A simple, ergonomic chair designed for an office lounge, with wooden legs and a comfortable cushion.

** Your prompt can be as simple or as detailed as you like. Adjectives and intended uses (e.g., "office lounge") help guide the design, but no need for complex data.*

Step 2: Generate Programmatic Command

After entering your prompt:

- 1. Press the "Generate" Button:** Amoeba will convert your textual description into a structured, AI-readable command.
- 2. Wait for Generation:** The command is processed by the LLM and returned as a programmatic prompt, which will appear in the designated output field.

Step 3: Generate Geometry

Once you have your programmatic command:

- 1. Press the Second Button ("Create Model"):** Amoeba sends the programmatic command to the AI-driven geometry engine.
- 2. Wait for Geometry:** After a short processing time, the generated 3D model will appear as geometry inside Rhino's viewport.

TIPS FOR CREATING EFFECTIVE PROMPTS

- 1. Be Descriptive:** Include key attributes like style, and usage context.
- 2. Keep It Natural:** Write prompts as you would describe the object verbally, not as code.
- 3. Iterate:** If the result isn't what you expected, modify your prompt and regenerate.

Example prompts:

- "A minimalist, mid-century modern chair with smooth, curved edges."
- "A sturdy, outdoor armchair suitable for a patio"