

**PROFESSIONAL
CERTIFICATE
IN MACHINE LEARNING
AND
ARTIFICIAL INTELLIGENCE**

**Module 23 Office Hour with
Jessica Cervi**

March 6th, 2025 at 6pm UTC

What is Generative AI?

Generative AI: Transforming Creativity & Automation

Generative AI refers to artificial intelligence models that create new content, including text, images, music, and code, by learning from vast datasets. Using advanced machine learning techniques like deep learning and neural networks, these models generate human-like outputs, enabling applications in content creation, design, data synthesis, and automation. Popular examples include ChatGPT for text, DALL·E for images, and GitHub Copilot for coding.

Key Benefits:

- Automates creative tasks
- Enhances productivity
- Personalizes user experiences

Revolutionizing industries from marketing to healthcare and beyond!

An Overview of OpenAI and its API

OpenAI is an AI research and deployment company working on the mission of ensuring that artificial general intelligence benefits all of humanity.



The OpenAI API (Application Programming Interface) serves as a bridge to OpenAI's powerful machine learning models, allowing you to integrate cutting-edge AI capabilities into your projects with ease.

For example, you can add cool features like understanding and creating text without having to know all the nitty-gritty details of the underlying models.

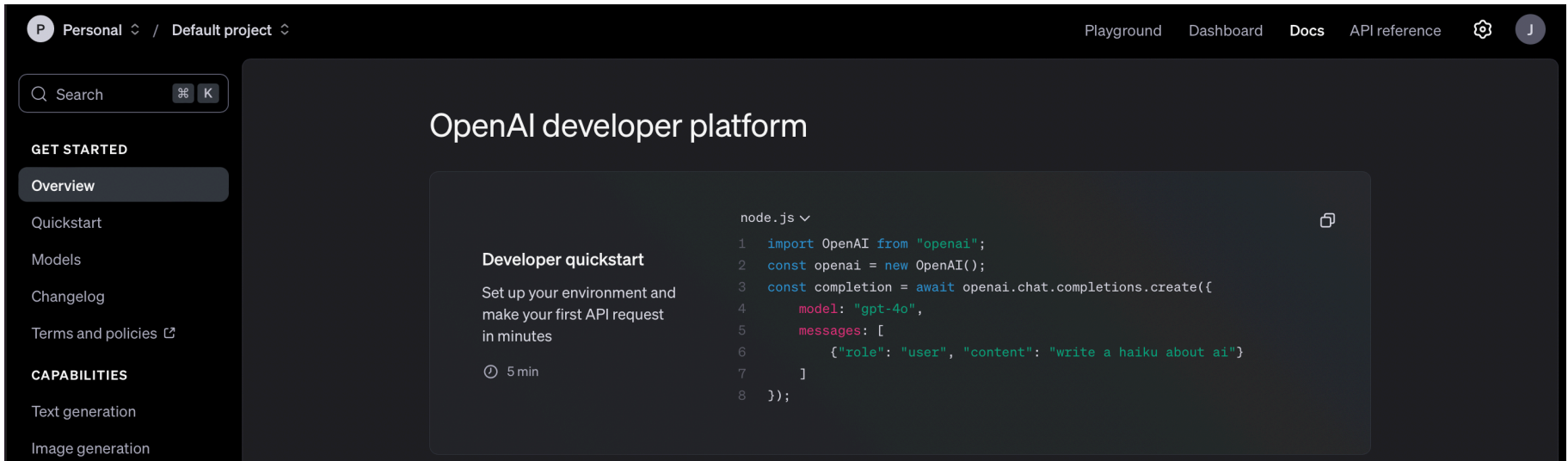
Features of the OpenAI API

- 1. Pre-trained AI models:** The AI models are released in API form, meaning “they train once, we use many times,” which can be a huge time and resource saver. Some of these models include GPT-4, DALL-E, Whisper, etc.
- 2. Customizable AI models:** Customizing models in the OpenAI API primarily involves a process known as fine-tuning, which allows users to adapt pre-trained models to better suit their specific use cases.
- 3. Simple API interface:** The OpenAI API platform is intuitive and simple for a beginner to use. It's straightforward to start using the API in your use cases without having to traverse a steep learning curve.
- 4. Scalable infrastructure:** As your projects become larger and more complex, you need an infrastructure that can grow with them. OpenAI API's ability to scale when usage increases is especially useful when you move from small projects to larger, more demanding ones.

Getting Started with the OpenAI API

Step 1: Create an OpenAI platform account

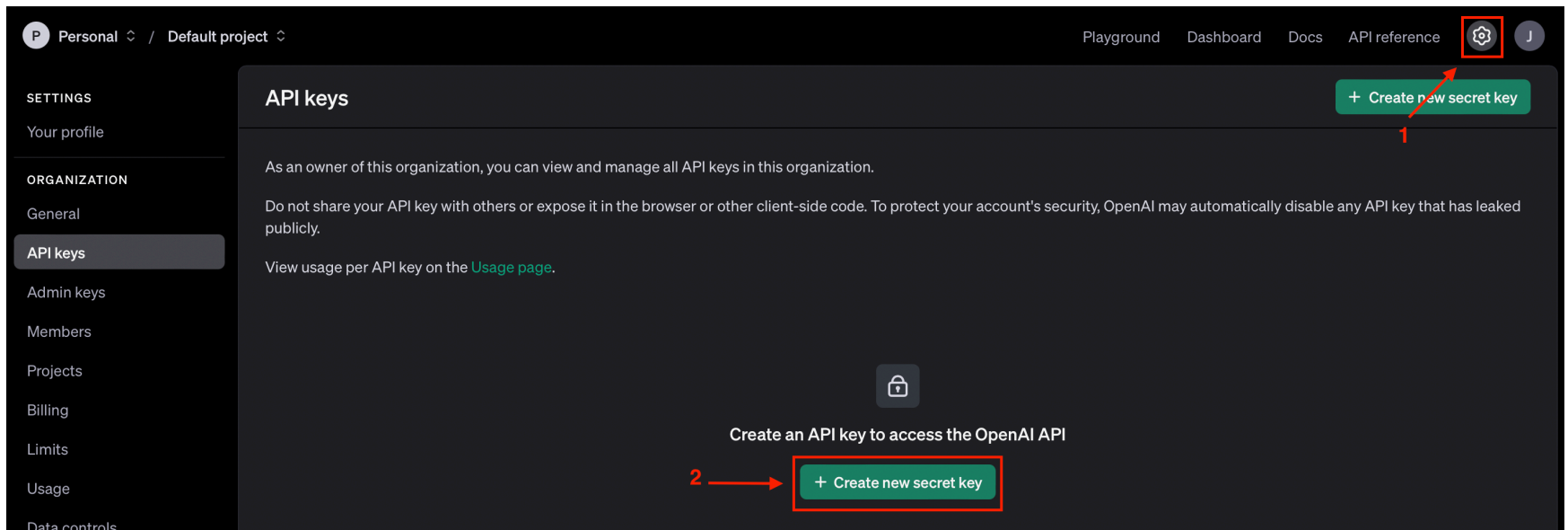
Navigate to the [OpenAI's platform](#) and follow the prompts to create an account. You should be seeing something like this once signed up:



Getting Started with the OpenAI API

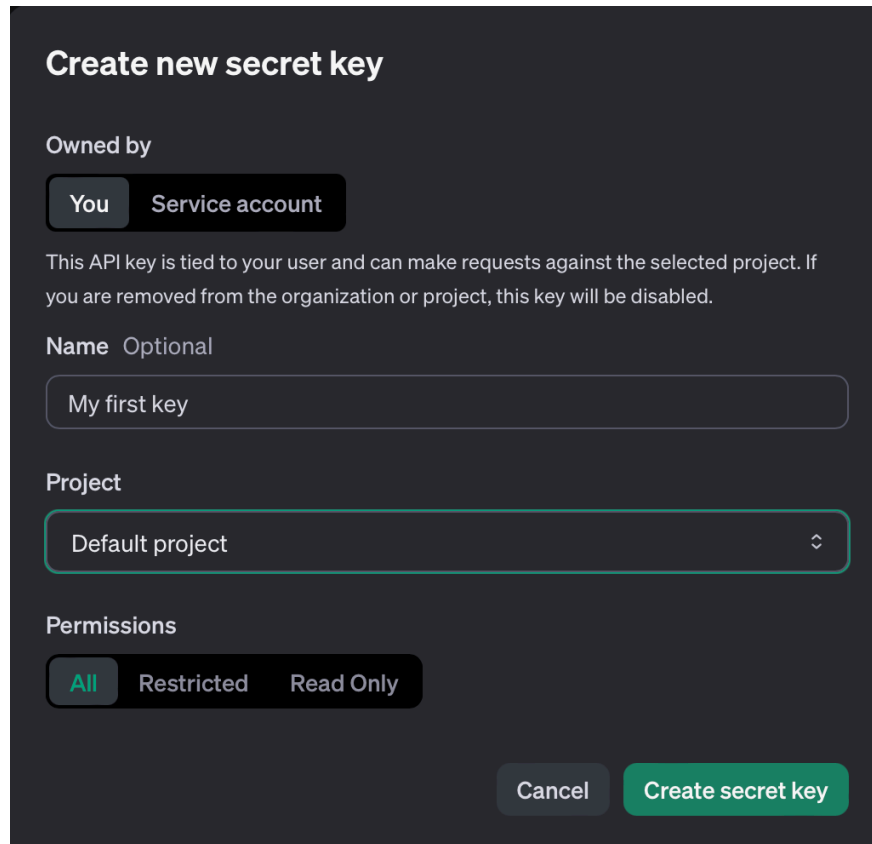
Step 2: Get your API key: Once your account is set up, you'll need to retrieve your API key, which is essential for interacting with the API.

To create an API key, click on the gear icon at the top of the page, then select “+ Create new secret key” as shown in the image below.



Getting Started with the OpenAI API

Step 3: Name your API key: In the next modal, give a name to your API key and select the “Default project” from the drop-down menu. Then click on “Create secret key”.



The screenshot shows a dark-themed modal titled "Create new secret key". It contains several sections: "Owned by" with buttons for "You" (selected) and "Service account"; a warning text stating "This API key is tied to your user and can make requests against the selected project. If you are removed from the organization or project, this key will be disabled."; a "Name" section with the label "Optional" and a text input field containing "My first key"; a "Project" section with a dropdown menu showing "Default project"; and a "Permissions" section with buttons for "All" (selected), "Restricted", and "Read Only". At the bottom right are "Cancel" and "Create secret key" buttons.

Create new secret key

Owned by

You Service account

This API key is tied to your user and can make requests against the selected project. If you are removed from the organization or project, this key will be disabled.

Name Optional

My first key

Project

Default project

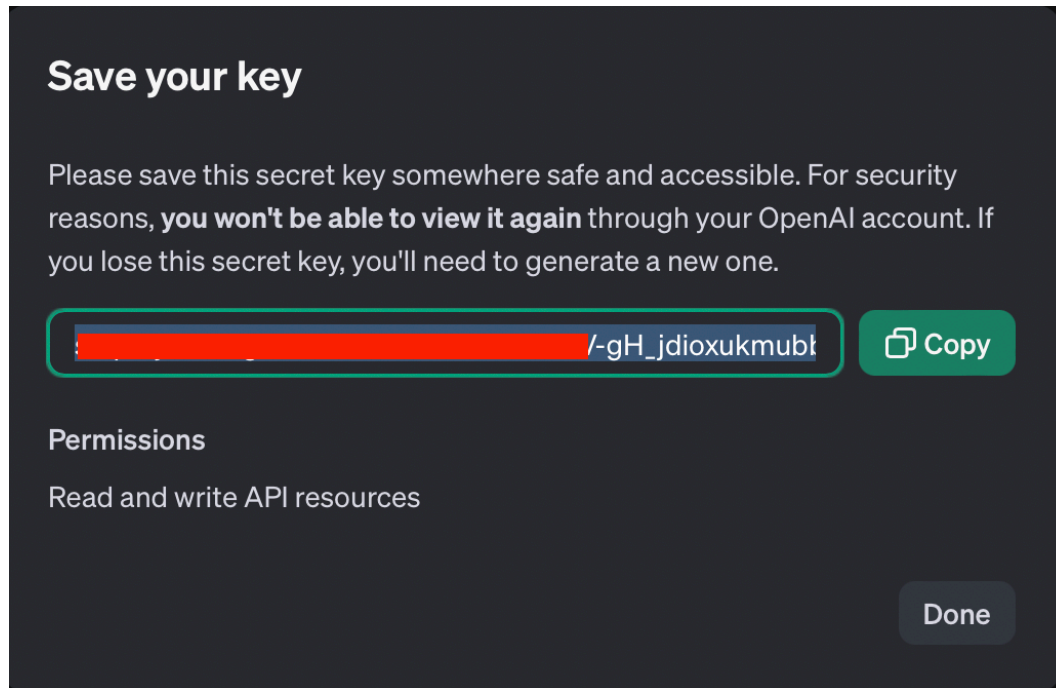
Permissions

All Restricted Read Only

Cancel Create secret key

Getting Started with the OpenAI API

Step 4: Save your API key: Once created, you must save the newly created API key to a secure location. You won't be able to see or copy the API key from OpenAI again.



Getting Started with the OpenAI API

Step 5: Install and Use the OpenAI library: Once you have your API key, you can start using OpenAI for your projects.

This [Google Colab notebook](#) contains examples about how to use the OpenAI API



Introduction to Hugging Face

Hugging Face is a machine learning and data science platform and community that helps users build, deploy and train machine learning models.

Users can browse through models and data sets that other people have uploaded. Hugging Face is often called the GitHub of machine learning because it lets developers share and test their work openly.

The platform is important because of its open source nature and deployment tools. It allows users to share resources, models and research and to reduce model training time, resource consumption and environmental impact of AI development.



Hugging Face

Benefits of using Hugging Face

1. **Accessibility.** Hugging Face helps users bypass restrictive compute and skill requirements typical of AI development.
2. **Integration.** Hugging Face helps users integrate multiple ML frameworks such as TensorFlow and PyTorch
3. **Community.** Hugging Face provides access to a vast community, continuously updated models, and documentation and tutorials.
4. **Cost-effective.** Hugging Face provides cost-effective and scalable solutions for businesses. Building large ML models from scratch can be expensive, and using Hugging Face's hosted models saves money.



Hugging Face

Getting Started with Hugging Face

[Join Hugging Face](#) and begin exploring

The screenshot displays the Hugging Face website interface. At the top, the Hugging Face logo is on the left, followed by a search bar with the placeholder text "Search models, datasets, users...". To the right of the search bar are navigation links for Models, Datasets, Spaces, Posts, Docs, and Pricing, along with a user profile icon.

The left sidebar features a "New" button and a user profile for "jessicacervi". Below the profile are links for Profile, Inbox (0), Settings, Billing, and Get Pro. Further down are sections for Organizations (Create New) and Resources.

The main content area is titled "Following 4" and includes tabs for All, Models, Datasets, Spaces, Papers, Collections, Community, and Posts. A post by "Jaward" is shown, stating "Jaward posted an update about 5 hours ago" and "Suggested for you". The post content reads: "It's work like this that in some way signal the eventual 'dominance' of AI over all the sciences. 'We train our model on the six-dimensional N-body phase space, predicting particle velocities as the time derivative of the model's displacement outputs'". The post has 263 likes and a reply button.

The right sidebar shows a "Trending last 7 days" section with tabs for All, Models, Datasets, and Spaces. It lists three trending models: "microsoft/OmniParser" (Image-Text-to-Text, Updated 3 d..., 4.12k downloads, 957 likes), "stabilityai/stable-diffusion-3.5-large" (Text-to-Image, Updated 13..., 153k downloads, 1.01k likes), and "stabilityai/stable-diffusion-3.5-medium" (Text-to-Image, Updated 4 days a..., 16.7k downloads, 257 likes). At the bottom is "genmo/mochi-1-preview" (Text-to-Video, Updated 3 days ago, 824 likes).

Getting Started with Hugging Face

This [Google Colab notebook](#) contains an example about using HuggingFace



Questions?