Use Semantic Kernel to enhance your applications with AI

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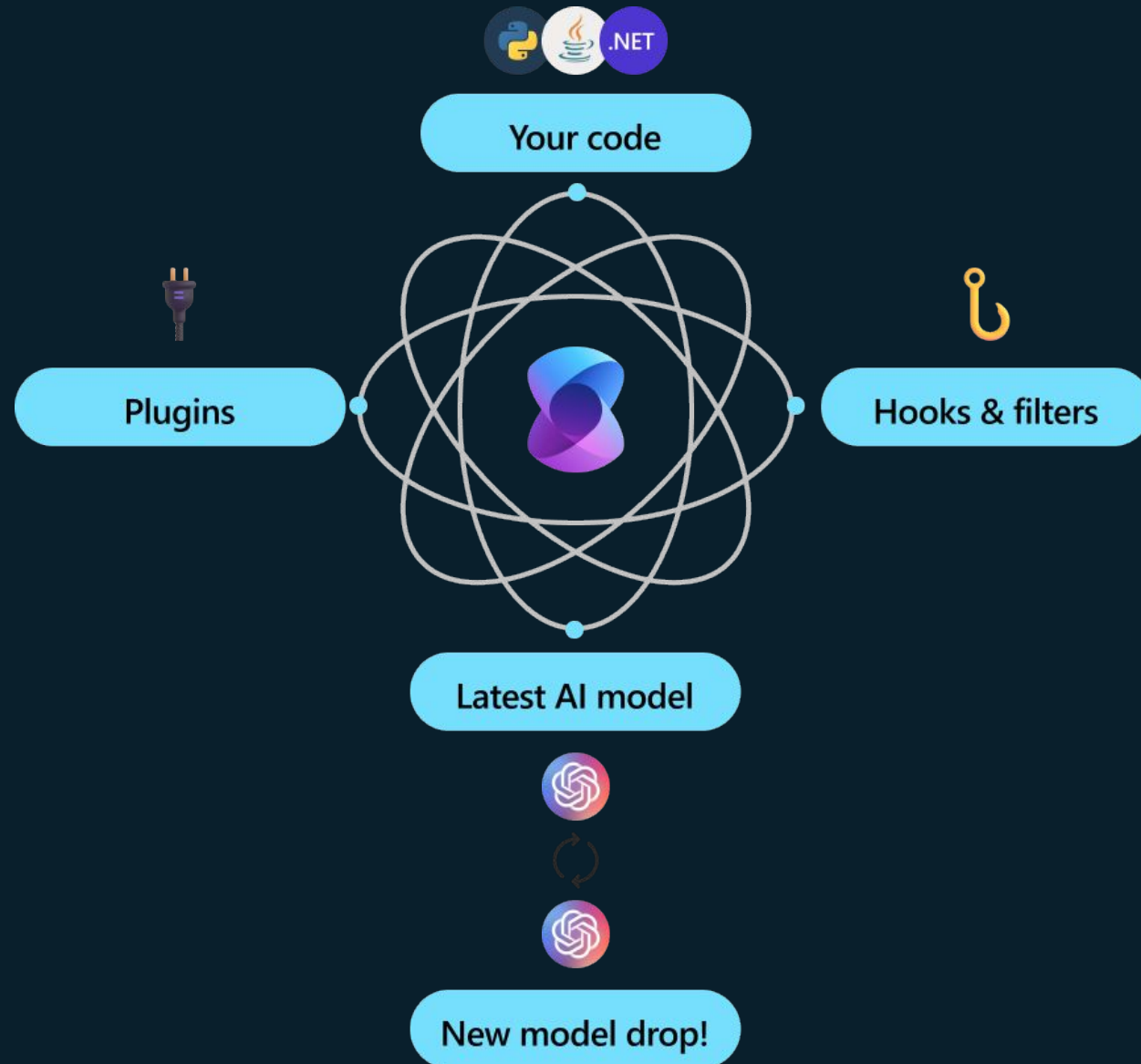https://jochen.kirstaetter.name/

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global AI

Bootcamp

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Semantic Kernel in a nutshell

Use cases for Semantic Kernel

Text generation

GTP-4o to generate text

Image generation

DALL-E 3 to generate images

Multimodal

GPT-4o & GPT-4o-Realime to explore the different types of input

Agents

Explore the capabilities of building agents to perform tasks

Grounding

Integrate with Bing Search

RAG

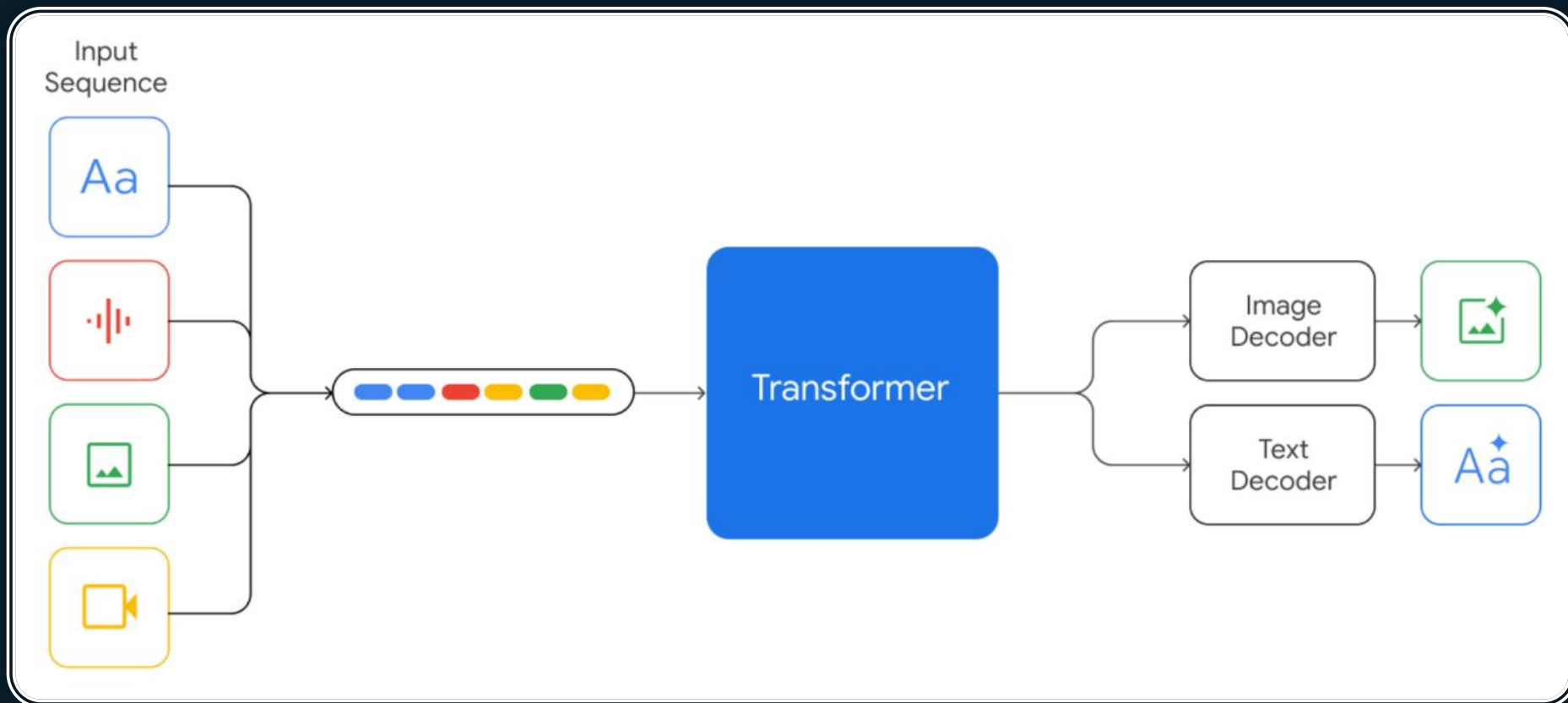Add your own information to improve retrieval

Audio / Video Analysis

Transcribe and timestamp your recordings

Tune Models

Enhance a model with own datasets

Multimodality

Integrate your programs/apps

How to get started (VS Code)

Talk is cheap.
Show me the code.

@ Linus Torvalds

Chat using Google Gemini – Setup

```csharp
using Microsoft.Extensions.Configuration;
using Microsoft.Extensions.DependencyInjection;
using Microsoft.SemanticKernel;
using Microsoft.SemanticKernel.ChatCompletion;
using Microsoft.SemanticKernel.Connectors.Google;
using Microsoft.SemanticKernel.Connectors.OpenAI;


// Get the API key from the configuration
var configuration = new ConfigurationBuilder()
    .AddJsonFile( path: "appsettings.json", optional: true)
    .AddJsonFile( path: "appsettings.user.json", optional: true, reloadOnChange: true)
    .AddEnvironmentVariables() // IConfigurationBuilder
    .Build();
var apiKey :string = configuration["Gemini:Credentials:ApiKey"];  //
```

Chat using Google Gemini – Build Chat Service

```
21   ServiceCollection c = new();
22   c.AddGoogleAIGeminiChatCompletion(modelId:"gemini-2.0-flash", apiKey, GoogleAIVersion.V1_Beta);
23   c.AddKernel();
24   // c.AddLogging(b => b.AddConsole().SetMinimalLevel(LogLevel.Trace));
25   c.AddSingleton<IFunctionInvocationFilter, PermissionFilter>();
26   IServiceProvider services = c.BuildServiceProvider();
27
28   Kernel kernel = services.GetRequiredService<Kernel>();
29   PromptExecutionSettings settings =
30       new GeminiPromptExecutionSettings()
31       {
32           ToolCallBehavior = GeminiToolCallBehavior.AutoInvokeKernelFunctions,
33           Temperature = 0.8,
34           MaxTokens = 8192,
35           FunctionChoiceBehavior = FunctionChoiceBehavior.Auto(),
36           ResponseSchema = typeof(Demographics)
37       };
38   IChatCompletionService chatService = services.GetRequiredService<IChatCompletionService>();
```

Chat using Google Gemini – Run the Chat loop

```
38    IChatCompletionService chatService = services.GetRequiredService<IChatCompletionService>();
39    ChatHistory history = new();
40
41    while (true)
42    {
43        Console.Write("Q: ");
44        history.AddUserMessage( content: Console.ReadLine());
45
46        var assistant :ChatMessageContent = await chatService.GetChatMessageContentAsync(
47            history,
48            settings,
49            kernel); // Task<ChatMessageContent>
50        history.Add(assistant);
51        Console.WriteLine(assistant);
52    }
```

Thank you, Global AI Bootcamp Lagos!

https://aka.ms/semantic-kernel
https://github.com/microsoft/semantic-kernel

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