UNDERSTANDING AGENTIC AI AND OPENAI'S AGENTS SDK

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📄 Title: Understanding Agentic AI and OpenAI's Agents SDK

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Abstract:

This paper provides a concise exploration of Agentic AI, Large Language Models (LLMs), and Generative AI, highlighting their differences and real-world applications. It further explains the role and importance of OpenAI's Agents SDK in developing intelligent, autonomous AI systems. The goal is to build foundational understanding for developing Agentic systems in real-world scenarios using OpenAI tools.

1.Introduction:

With rapid progress in AI, two branches have emerged: Generative AI and Agentic AI. Generative AI focuses on creative content generation, whereas Agentic AI takes intelligent actions towards defined goals. This research also introduces OpenAI's Agents SDK, a powerful toolkit for building these intelligent agents.

2. What is Agentic AI?

Agentic AI refers to systems that can operate autonomously — reasoning, deciding, and taking actions toward achieving goals. These systems are:

- Goal-driven
- Capable of adapting and learning
- Able to handle multi-step processes independently

Example: AutoGPT, a system that plans and executes tasks without ongoing user input.

3. What are Large Language Models (LLMs)?

LLMs are deep learning models trained on vast textual data. They:

- Understand and generate human-like text
- Are based on **Transformer architecture**
- Support applications like chatbots, translation, and summarization

Working Mechanism:

1. **Training**: Learn word relationships by predicting the next word
2. **Inference**: Generate context-aware responses
3. **Contextual Reasoning**: Maintain conversation flow

4. What is Generative AI?

Generative AI focuses on creating new content like:

- Texts
- Images
- Audios & Videos

It uses LLMs to generate output based on learned data.

Example: ChatGPT, MidJourney, DALL·E

5. Generative AI vs. Agentic AI

Feature	Generative AI	Agentic AI
Role	Content Creation	Goal-oriented autonomous actions
Input	Requires user prompts	Can act with minimal input
Output	Text, image, music, video	Decisions, task execution
Examples	ChatGPT, DALL·E	AutoGPT, scheduling bots

Summary Analogy:
Generative AI is a creative artist. Agentic AI is a project manager.

6. OpenAI's Agents SDK

➢ What is it?

A Python-based SDK for building Agentic AI systems, combining **LLMs** with tools and workflows to perform **autonomous tasks**.

➢ Key Features
- **Agent Creation** with instructions and tools
- **Handoffs** between agents for task delegation
- **Guardrails** for safety and validation
- **Tracing** for debugging and monitoring
- **Python Tool Integration** for automation

➢ Why Use It?
- Simplifies **multi-agent systems**
- Maintains **state and context**
- Ideal for real-world **production applications**
- Supports **scalable, maintainable development**

➢ Benefits
- Faster development and experimentation
- Parallel agent workflows
- High reliability with guardrails
- Adaptable, real-time interaction
- Easier debugging and monitoring

7. Conclusion

Agentic AI is a powerful extension of AI, shifting from passive response generation to autonomous decision-making and task completion. Combined with OpenAI's Agents SDK, developers can now build intelligent systems that think, act, and adapt—paving the way for the next generation of AI applications.