

소프트웨어특강 -Agent101-

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이선재

Dept of Computer Science and Engineering,
Sungkyunkwan University (SKKU)



About Me

- Sunjae Lee (이선재)
 - Education
 - PhD in CS from KAIST, 2025
 - MS in CS from KAIST, 2021
 - BS in CS from KAIST, 2019
 - Professional Experiences
 - **Assistant Professor**, Department of Computer Science and Engineering, SKKU, Mar. 2025 - present
 - **Chief Technology Officer (CTO)**, Fluiz, Jan. 2022 – Feb. 2025
 - » <https://fluiz.ai/>
 - Research interests: **Mobile-AI systems**
 - Mobile AI Assistant
 - AI Agent systems
 - Multi-device Mobile Platform
 - Mobile Operating Systems



About Me

– Contact

- Office: Engineering 2 #27324 (제 2공학관 27동 3층 27324호)
- Lab Homepage: <https://sites.google.com/view/fclab-skku>
- Email: sunjae.lee@skku.edu
- Office hours: by appointments

Welcome to ChatGPT/Agent101!

- **Class schedule**

- Monday (09:00 – 10:15):
- Wednesday (10:30 – 11:45)
- Place: #85613

- **Attendance**

- via Electronic Attendance System
 - <https://attend.skku.edu>
- Present: -10 Min ~ Class start time ~ +15 min
- Late: Class start time + 15 min ~ 30 min
- Absent: Class start time + 30min or absent
- **You will be given F if you are absent 8 times or more.**

Welcome to ChatGPT/Agent101!

- **Grades:**

- 10%: Attendance
- 15%: Homework
- 15%: Project Proposal Presentation
- 20%: Quiz
- 40%: Final Project Presentation
- **No Exam!**

- **Homework:**

- Submit at least a half-page report after watching a YouTube video or reading an article.
 - If you are caught using AI to write your report, you will receive 0 for the entire Homework grade (not just that assignment).

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- **Quiz:**

- You will take quiz using <https://aicampus.app/>
- In the spirit of this course, quizzes will be **automatically graded by an AI agent**
- You may ask questions or make claims about your score.
- You are allowed **to fool the AI Agent (prompt hacking)** to raise your score, but:
 - You must share how you did it on the iCampus discussion board.
 - You may not use the same technique more than once.
 - You may not use a technique that someone else has already shared.
- **You will get F for the entire course if you use ChatGPT (or any other AI tools) during quiz**

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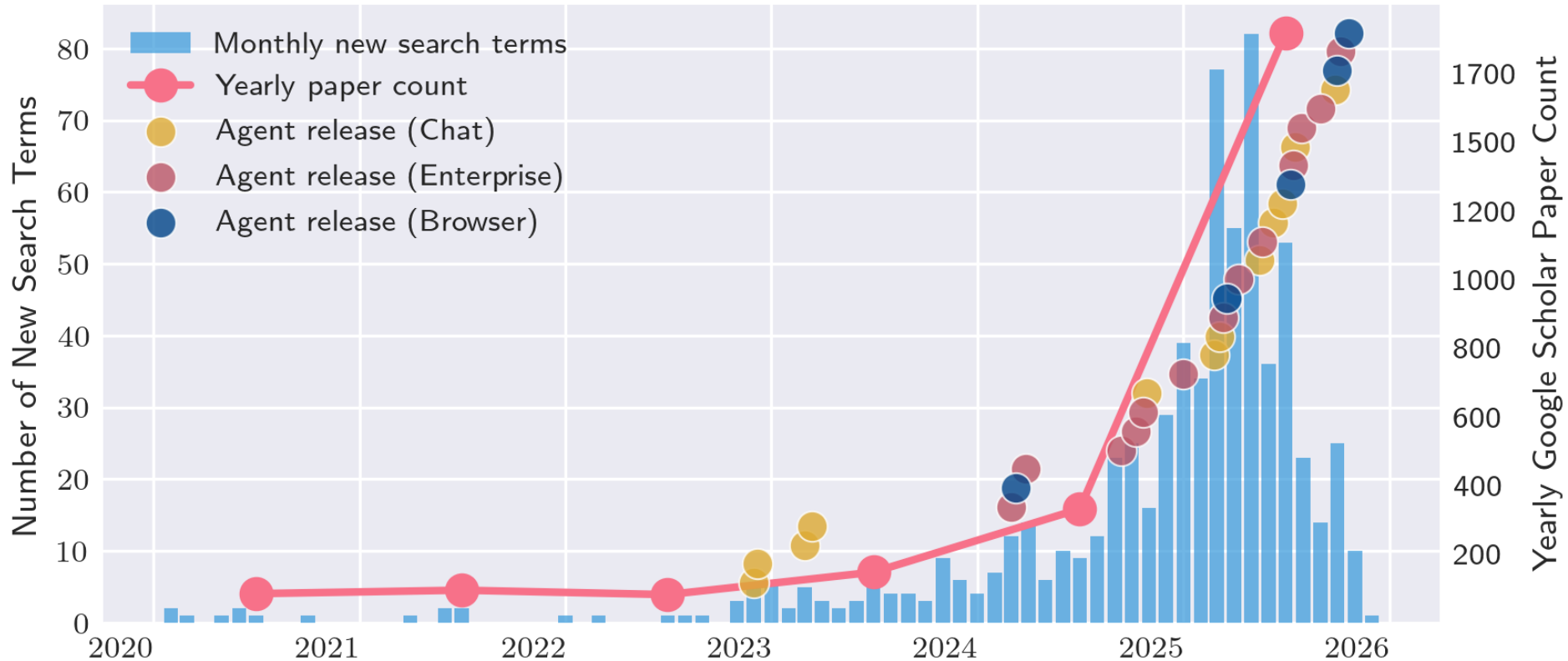
- **5-minute Project Proposal**

- Everyone should present their idea for the final project
- **Team formation:** Form teams around the most interesting ideas. Each team must have two to four members.
 - If your idea is selected, you will get extra point for the final project

- **Final Project**

- Create an interesting AI tool or service.
- Must be a **working end-product service** — not just a model.
 - Final presentation: 10~15 min presentation on your final product.

Rise of AI Agents



<https://aiagentindex.mit.edu/>

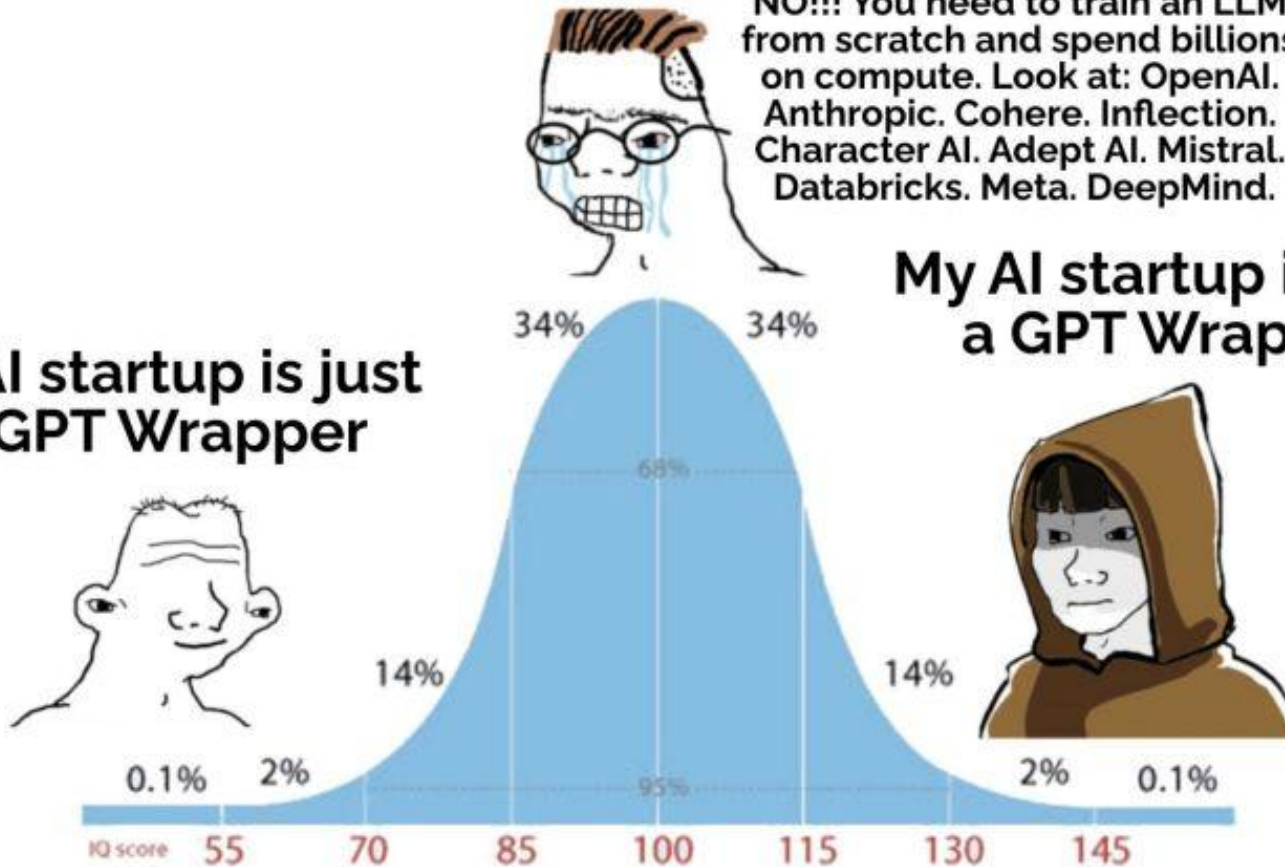
Rise of AI Agents

- Agents? GPT Wrapper?

NO!!! You need to train an LLM from scratch and spend billions on compute. Look at: OpenAI. Anthropic. Cohere. Inflection. Character AI. Adept AI. Mistral. Databricks. Meta. DeepMind.

My AI startup is just a GPT Wrapper

My AI startup is just a GPT Wrapper



Rise of AI Agents



Perplexity (Web search agent): **\$20 Billion ~ 26조 원**



Cursor (Coding Agent): **\$9.9 Billion ~ 13조 원**

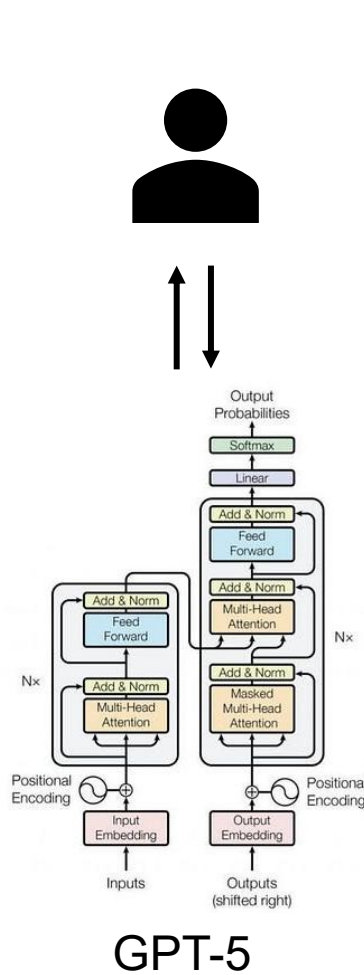


Manus (Agent Platform): **\$2 Billion ~ 3조 원**



OpenClaw (Autonomous Agent): **\$???**

What is ChatGPT?



GPT-5

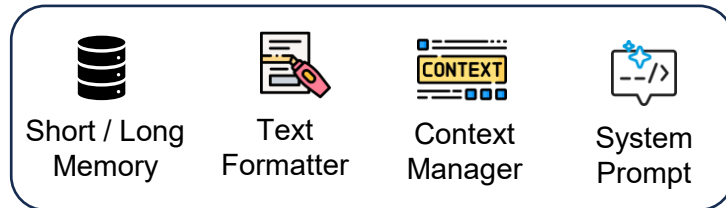
What people think



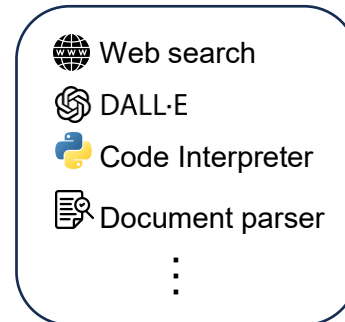
Quality Control



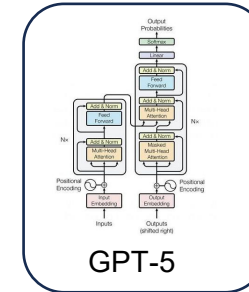
Conversation Management



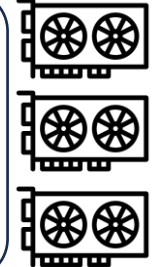
Tool Sets



Model Serving Framework



GPU Infrastructure



How it actually works

What if you don't know how it works

침착맨이 원하는 휴대폰 찾기

네 알겠습니다

챗GPT

2 을묘목
정말

2 치즈뿔
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▶ HK P
저러면서 군대에서 후임 괴롭힌거
아님?

▶ 에밀리언
버벅 된다

2 말랑펀치
gpt : 뭐지 이인간

2 천상의 힐러 5119
고로취

2 덩기덕쿵
궁금하다 그런 기종이 있을까요

2 동동이임
고로취

2 민트초코향감자
개떡같이 말해도 찹떡같이 알아듣네

2 종수와 감나무
돌리네 ㅋㅋ

173 2,262 4,674 7,109

Lecture Overview

- **Week 1-3: Introduction**
 - Course Orientation
 - Intro to LLM (DL Primer, Transformers, Pre-training, Post training)
- **Week 4-7: Trends in modern LM**
 - Reasoning Model, Test-time Compute
 - Modern AI architecture
 - On the biology of LLM
 - Benchmarking
 - Systems for AI
- **Week 8**
 - Midterm exam week (No class)
- **Week 9-15: AI Agent**
 - Project presentations
 - Prompt & Context Engineering
 - Prompt Hacking
 - Memory & Retrieval Augmented Generation (RAG)
 - Agents
 - Case Studies
- **Week 16**
 - Final exam week (No class)

What this course is about

- **Goal:** Gain a high-level understanding of how modern AI services are built.
 - Examples: ChatGPT, Cursor, Claude Code, ...
- **No Math Required!**
 - Today, you don't need to know every detail of machine learning to become an AI engineer or AI scientist.
 - Just like how you no longer need to master assembly language or compiler design to be a good programmer.
 - But, to make full use out of these AI, we must know how it works and what's its full capability.
- **Focus of the Course:**
 - Learn how to use LLMs as a tool to create your own services and programs.
 - But you should still understand how it works at a high level to use it effectively

First Homework!

Intro to Large Language Models:

https://www.youtube.com/watch?v=zjkBMFhNj_g&t=2012s&ab_channel=AndrejKarpathy

1hr Talk on what you will learn in this course up to the midterm.