ReDel

A Toolkit for LLM-Powered Recursive Multi-Agent Systems

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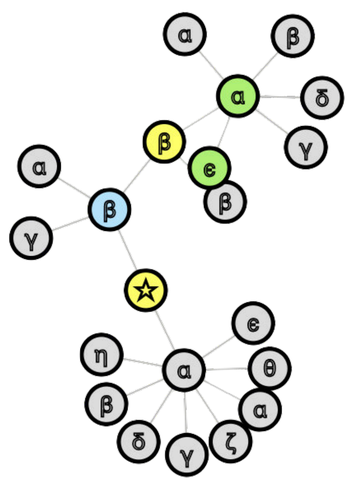
Try the demo on your own device!

ReDel is a toolkit for humans to prototype, visualize, and debug LLM agents with a graphical interface.

Recursive Multi-Agent Systems

- Today's multi-agent systems rely on human-defined agent graphs and expertise for specific tasks, like software engineering.
- *Recursive* multi-agent systems allow agents to dynamically define the topography of the agent graph and generalize to unseen tasks.



Delegation Graph

Comparison

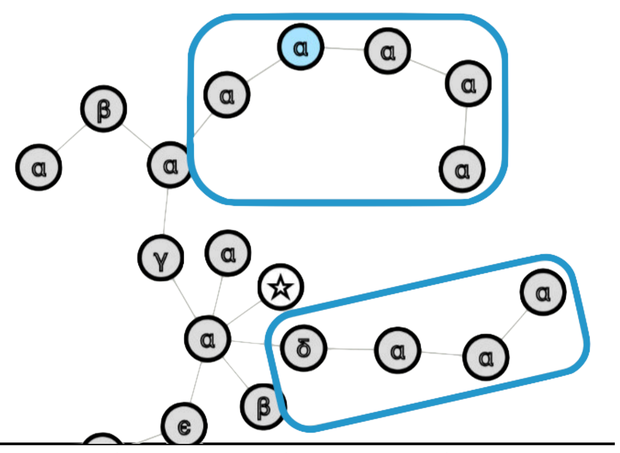
	ReDel	LangGraph	LlamaIndex	MetaGPT	AutoGPT	XAgent
Dynamic Systems	✓	✗	✗	✗	✓	✓
Parallel Agents	✓	✓	✓	✗	✗	✗
Event-Driven	✓	✗	✓	✗	✗	✗
Run Replay	✓	✓	✗	✗	✗	✗
Web Interface	✓	💰	✗	✗	✓	✓
Fully Open Source	✓	✗	✗	✓	✓	✓

Case Study

We tested recursive systems using GPT-4o and GPT-3.5-turbo, and used ReDel to analyze failures visually. We found the following failure cases:

Overcommitment (OC): The agent attempts to complete an overly-complex task itself.

Undercommitment (UC): The agent performs no work and redelegates.



System	FOQA OC	FOQA UC	TP OC	TP UC	WA OC	WA UC
RD (4o)	22.7	11.3	41.1	0.5	31.3	44.8
RD (3.5-t)	40.8	1.1	96.7	0	54.6	17.7

Features

Modular System - Provide tools, use different LLMs, and test delegation methods.

Event-Driven - Define and surface custom events from anywhere in the system.

Run Replay - Detailed logging allows step-by-step replay of a single run's trajectory.

Web Interface - Visually build, iterate, and analyze recursive multi-agent systems.

Fully Open Source - No features locked behind paywalls - built for research.

pip install redel
github.com/zhudotexe/redel
redel.readthedocs.io
redel-demo.zhu.codes
Penn NLP @ University of Pennsylvania

Paper

GitHub