

LangChain: The AI Chain to Rule all the Rules



550 Vandalia St #231

Saint Paul, MN 55114

lab651.com

justin@lab651.com

About Me

- Founder, **Lab651 & Recursive Awesome** – Custom Software Development and AI Strategic Consulting
- Co-founder, **Captovation** – AI powered online presentation coaching platform
- Owner, **Applied AI Weekly** – Publication covering AI
- Host of the “**Conversations on Applied AI Podcast**”
- Adjunct Professor, **University of Saint Thomas** – Teaching graduate courses on IoT & AI/ML
- Co-founder, **Applied AI** – 501(c)(3) non-profit: Monthly meetups, conferences, videos and podcasts on AI/ML



Agenda

- What is an LLM
 - What are they good at?
 - What are they not so good at?
- What is LangChain
 - How does it work
 - Components
- LangChain in action
- Streamlit for easy deployment!

LLMs and what are they good at?

A large language model is a type of Artificial Intelligence program that uses deep learning techniques to process, understand, and generate human-like text.

- **Content Generation:** Used for creating articles, reports, stories, and even poetry
- **Language Translation:** High-quality translations between numerous languages
- **Learning and Research:** Assist in educational and research activities by summarizing information
- **Conversation:** Human-like dialogue makes them useful for chatbots and virtual assistant

What are LLMs NOT Good At?

- **Fixed Knowledge Base:** Knowledge is static and limited to what was available when it was trained
- **Understanding Context Depth:** Struggles with deep or nuanced context
- **Ethical and Bias Issues:** Can inadvertently perpetuate biases present in training data
- **Problematic in highly specialized fields:** May not provide accurate or reliable information in niche or highly specialized areas
- **Dependency on User Input:** Relies heavily on the quality and clarity of user queries

LangChain – What Is it?

- Open source framework for developing applications powered by language models
- Enables applications to be:
 - Context Aware – Current events / documents, vocabulary, etc.
 - Reason – Custom functions, agents, memory/history, etc.
- Examples
 - Chatbots
 - Retrieval-Augmented Generation (RAG)
 - Summarization
- Model agnostic

OBSERVABILITY



LangSmith

DEPLOYMENT



LangServe

Chains as Rest APIs



Templates

Reference Applications

APPLICATION



LangChain

Python

JavaScript

Chains, Agents, Agent Executors

Common Application Logic

INTEGRATIONS
COMPONENTS

Models I/O

Model
Prompt
Example Selector
Output Parser

Retrieval

Retriever
Document Loader
Vector Store
Text Splitter
Embedding Model

Agent Tooling

PROTOCOL

LCEL

Parallelization · Fallbacks · Tracing · Batching · Streaming · Async · Composition



Monitoring



Evaluation



Annotation



Feedback



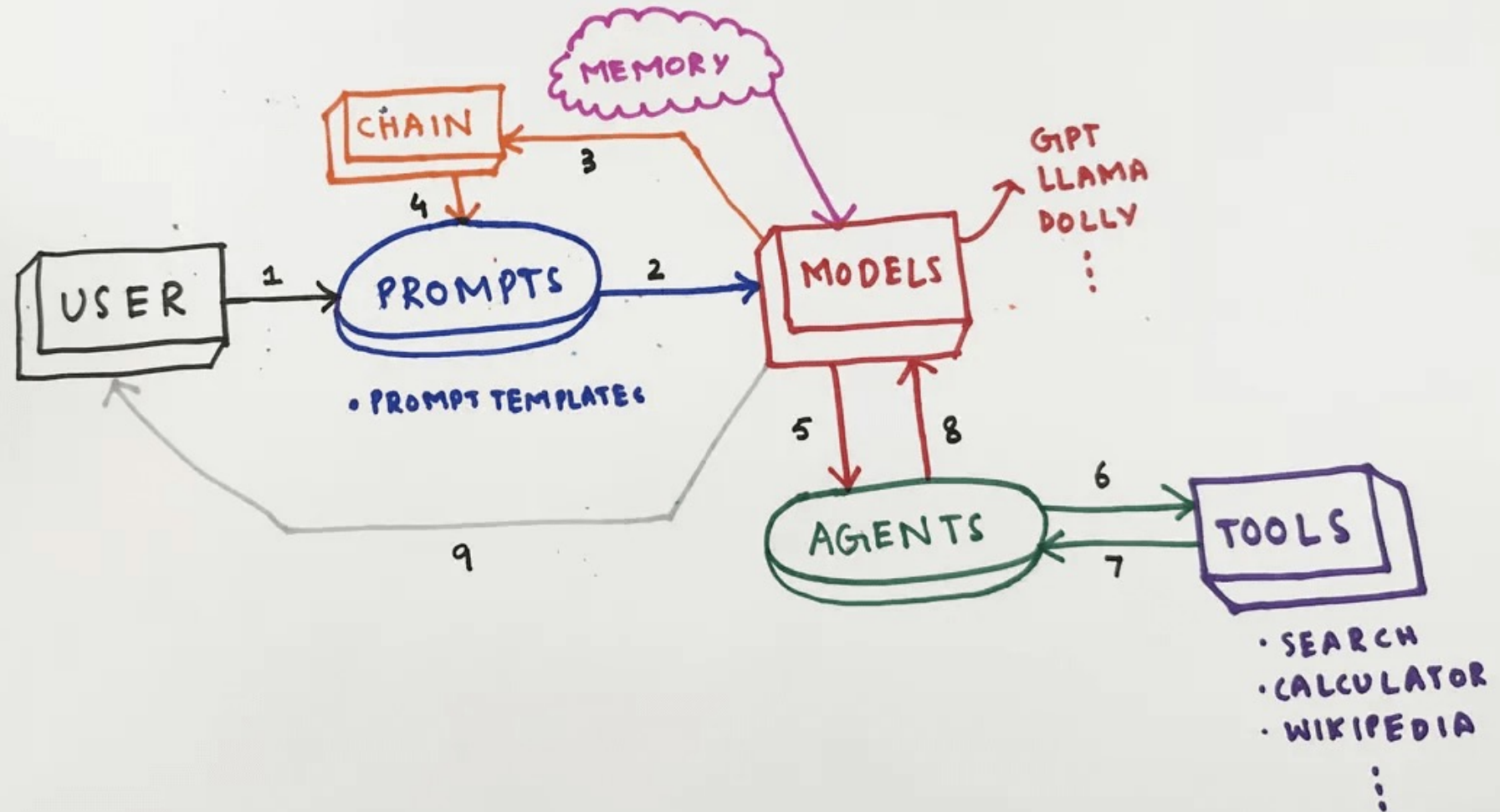
Testing



Debugging

LANGCHAIN

by BRILLIANT BYTES



Credit: <https://www.reddit.com/user/BrilliantBytes/>

Examples!

Thank You

Justin Grammens
Founder + CEO

justin@lab651.com

AppliedAI.MN



Please reach out. I would love to connect and discuss LangChain and its application more!