Running Local LLMs

Gem City Machine Learning

Nick Gerakines, 4/10/2024

Disclaimer: This presentation is provided “as is”, without warranty of any kind, express or implied. All information, content, and material are for general informational purposes only.

I'm Nick (he/him)

I'm a software engineer in the artificial intelligence, machine learning, and cognitive science space.

https://ngerakines.me/

Microsoft

What are LLMs?

What are they good for?

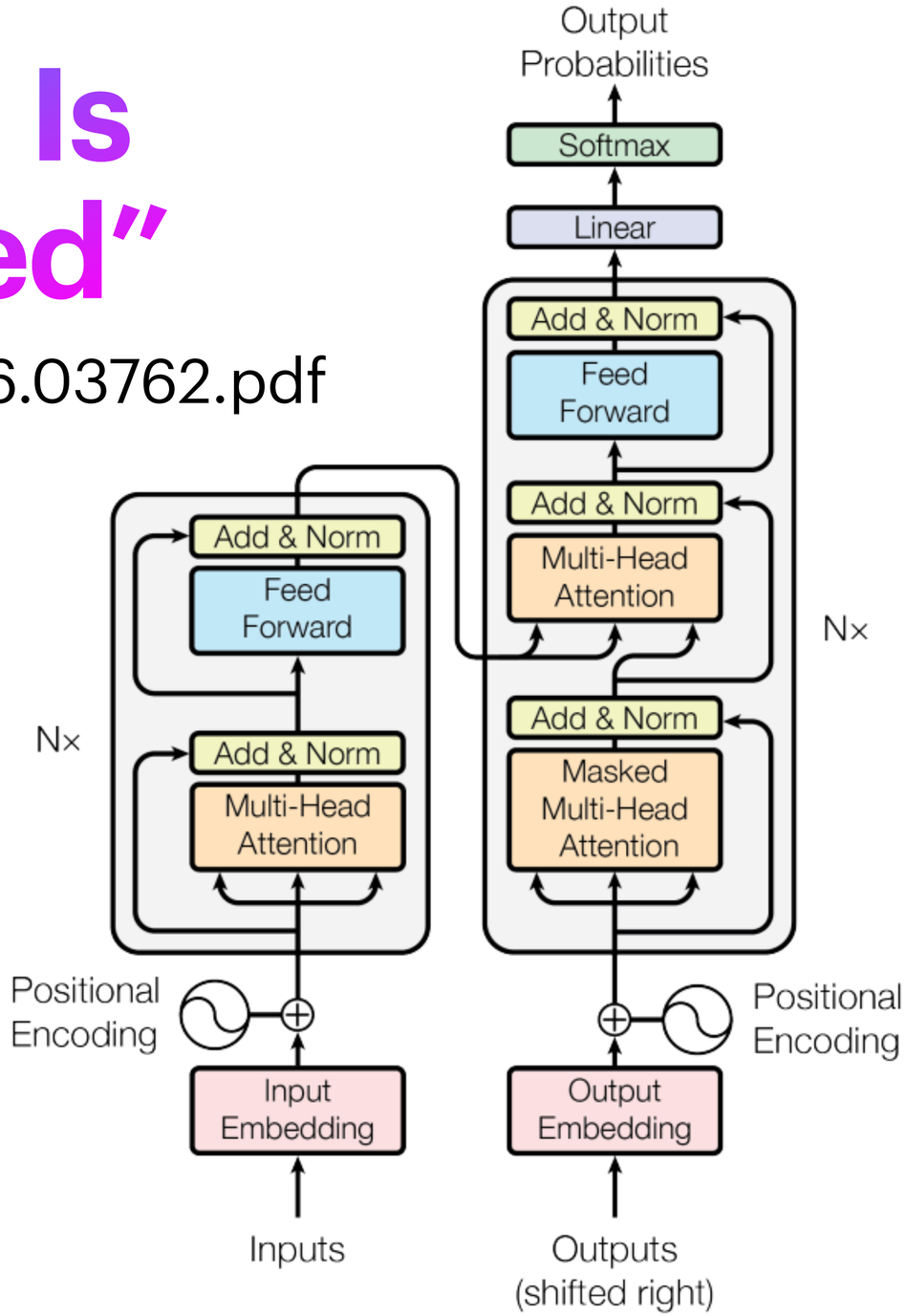
- Sentiment analysis
- Large data research
- Customer service
- Chat bots
- Online search and information retrieval
- General knowledge augmentation

But how do they work?

Transformers: Neural Networks

“Attention Is All You Need”

https://arxiv.org/pdf/1706.03762.pdf



LLM internals are complicated.

LLM internals are complicated.

ANOTHER DAY

A Brief History Of Time

- 2015
  - OpenAI Founded
- 2016
  - Stanford SQuAD (Stanford Question Answering Dataset) released
- 2017
  - “Attention is all you need” paper published
  - Tensor Flow Framework
  - USE (Universal Sentence Encoder)
- 2018
  - OpenAI GPT paper published
  - Google releases BERT
- 2019
  - OpenAI releases GPT-2
  - Microsoft releases LXMERT + invests $1 billion into OpenAI
  - Facebook releases RoBERTa
- 2020
  - OpenAI releases GPT-3
- 2021
  - OpenAI DALL-E
  - Google Transformer-X
  - Facebook XLM-R
  - Google LaMDA
  - Github Copilot
  - OpenAI Codex
- 2022
  - OpenAI InstructGPT
  - Hugging Face BLOOM
  - Google Woodcraft
  - OpenAI Chat GPT
- 2023
  - Microsoft $10 billion into OpenAI
  - Google BARD
  - Meta LLaMA
  - OpenAI GPT-4
  - Nvidia NEMO
  - Amazon Bedrock
  - Anthropic Claude 2
  - Meta LLaMA 2
- 2024
  - **Too Many To List**

Models

(The thing people are actually talking about.)

- GPT-4 (OpenAI)
- LLaMA (Meta)
- Bloom (BigScience)
- Gemma / Gemini (Google)
- Claude (Anthropic)
- Mistral / Mixtral (mistral.ai)

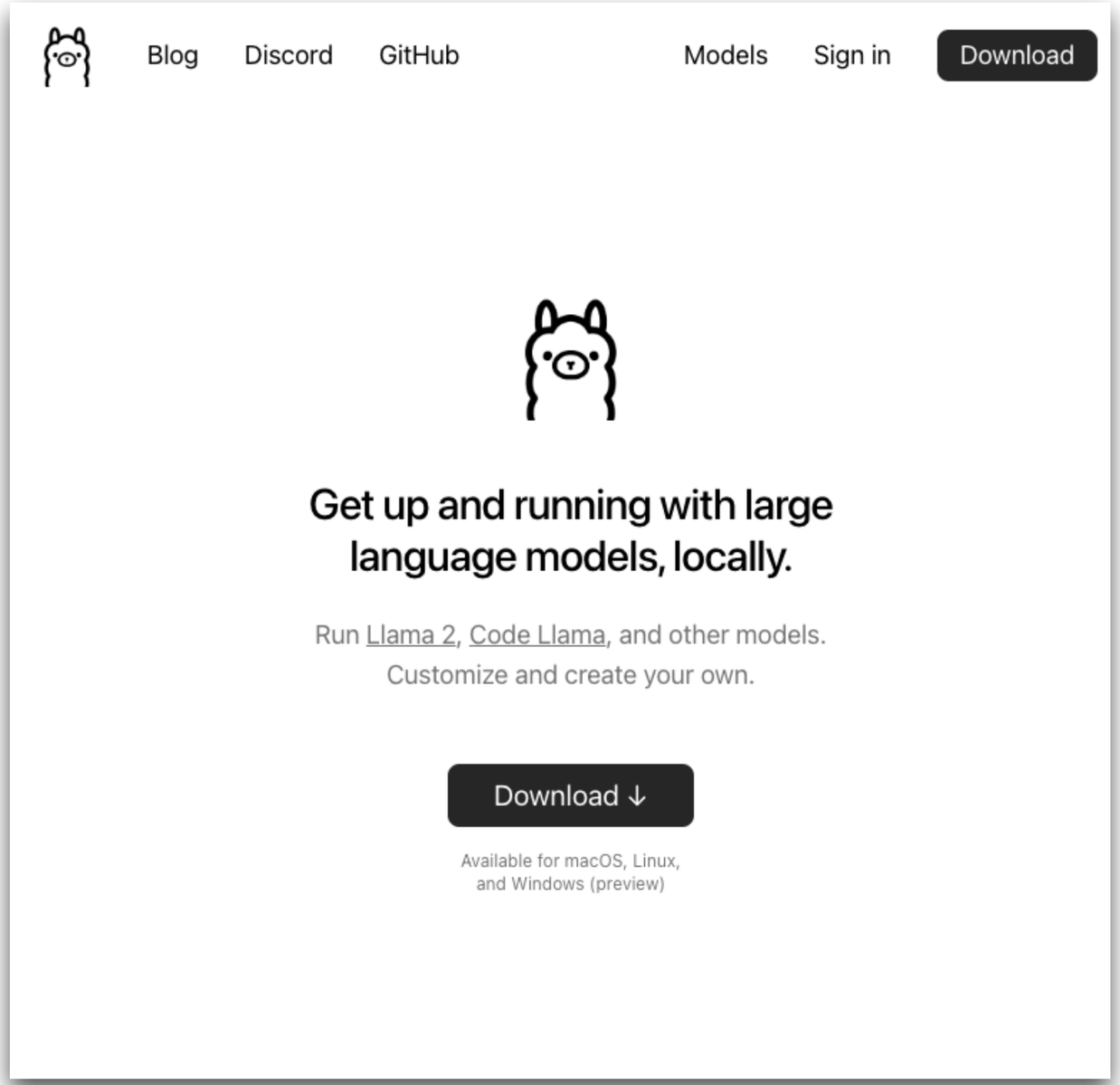
More: https://github.com/Hannibal046/Awesome-LLM

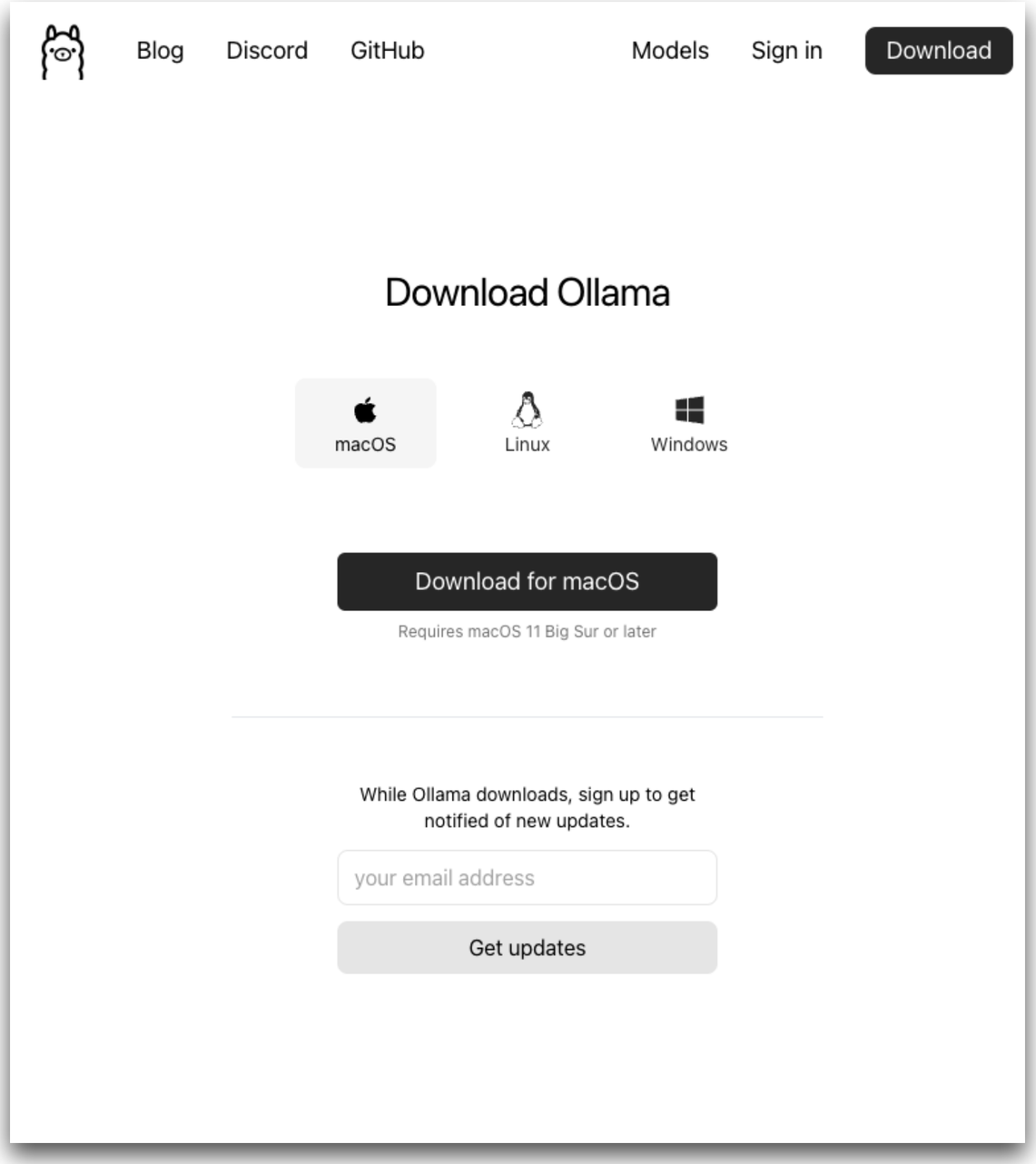
How do we actually use them?

ollama

https://ollama.com/

https://github.com/ggerganov/llama.cpp




Blog
Discord
GitHub
Models
Sign in
Download
Download Ollama
macOS
Linux
Windows
Download for macOS
Requires macOS 11 Big Sur or later
While Ollama downloads, sign up to get notified of new updates.
your email address
Get updates

Models

Filter by name...

Featured

gemma

Gemma is a family of lightweight, state-of-the-art open models built by Google DeepMind.

306.6K Pulls 69 Tags Updated 5 days ago

llama2

Some of my favorites:

ollama run llama2

ollama run gemma

ollama run llava

```
ollama run mixtral
```

ollama run codellama

ollama run phi

But offline?

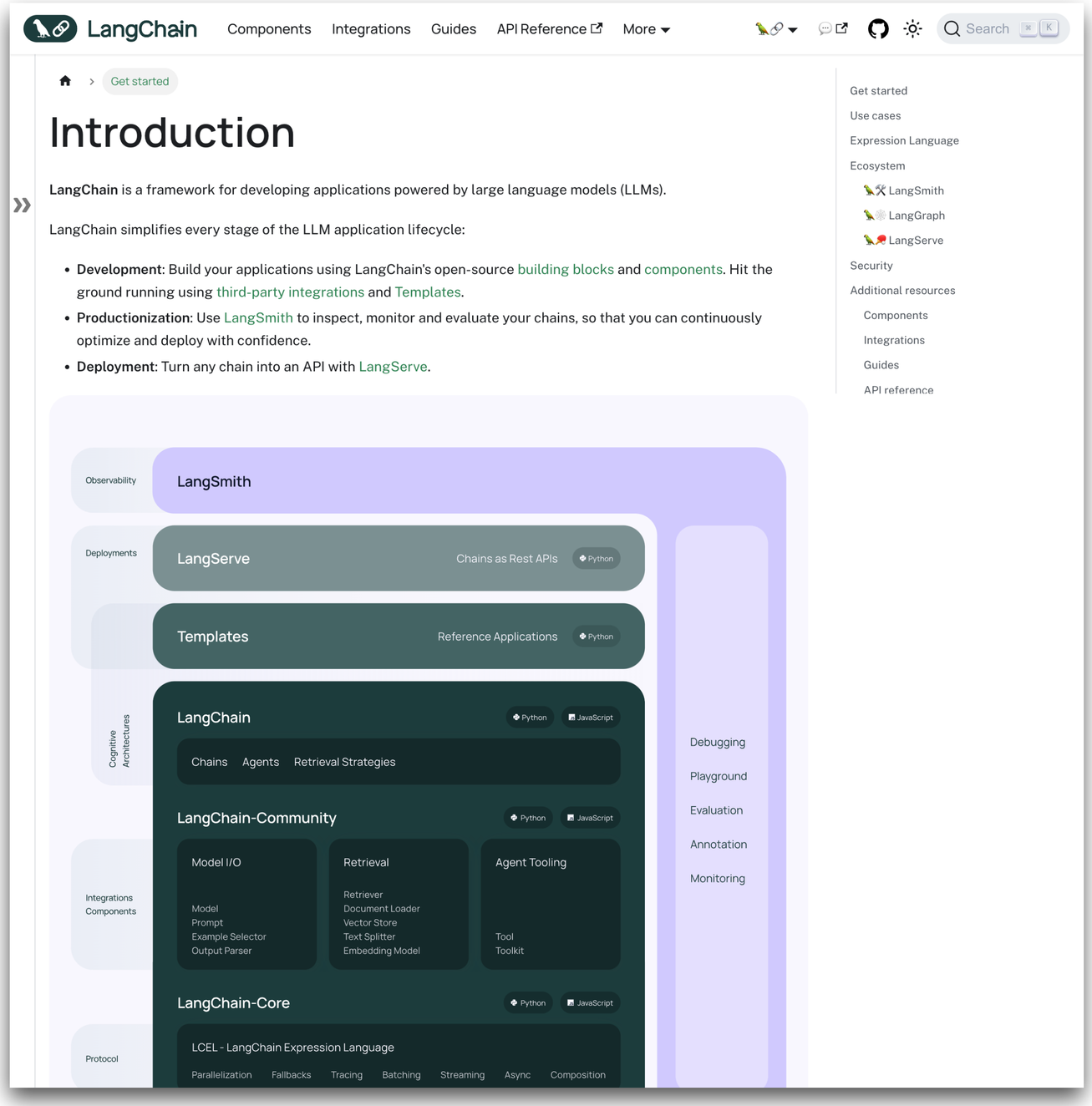
(demo)

Bonus

RAG

langchain

https://python.langchain.com/



(demo)

Questions?