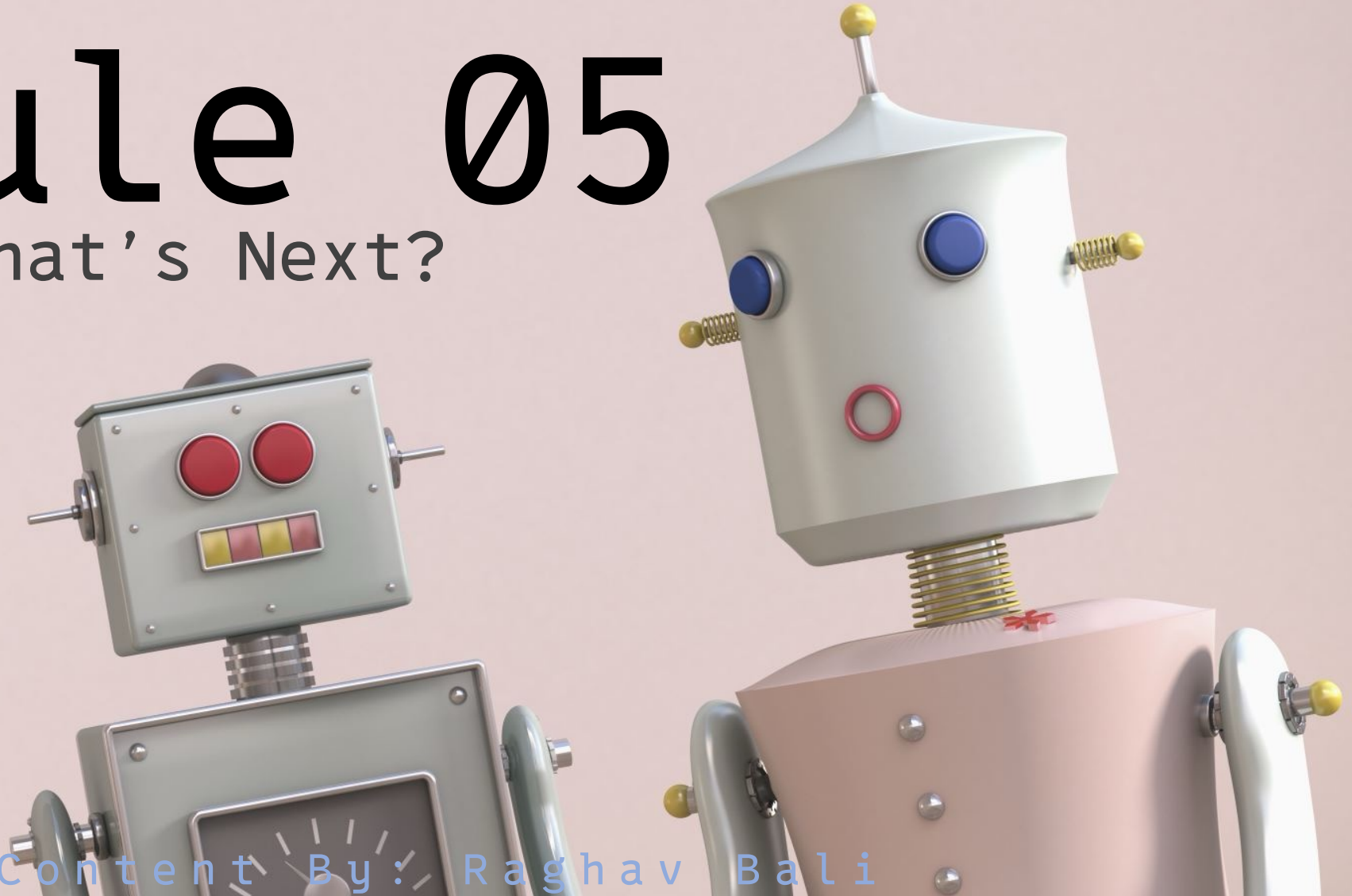
Module 05

What's Next?



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What's Next?

Optimizations

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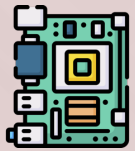
Optimizations

Architectural



Hardware / Software

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Optimizations

Architectural

- GeLU, Flash Attention, Mamba, BASED, MiniSequence ...

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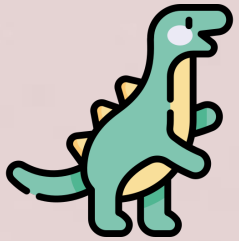
Optimizations

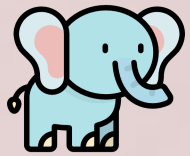
Architectural

- Model Size V/s Performance Efficiency
  - ➢ SLMs have entered the arena

GPT



GPT-4



Phi-2

On-Device?

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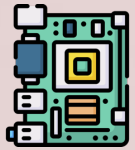
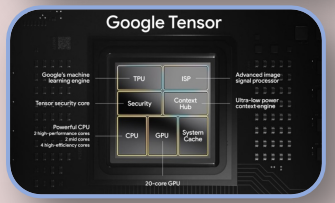
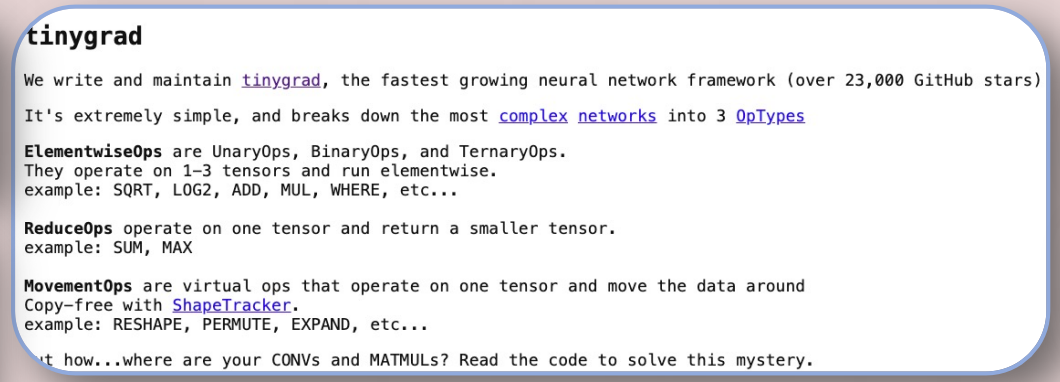
Optimizations



Hardware / Software





tinygrad

We write and maintain tinygrad, the fastest growing neural network framework (over 23,000 GitHub stars)

It's extremely simple, and breaks down the most complex networks into 3 OpTypes

ElementwiseOps are UnaryOps, BinaryOps, and TernaryOps.
They operate on 1-3 tensors and run elementwise.
example: SQRT, LOG2, ADD, MUL, WHERE, etc...

ReduceOps operate on one tensor and return a smaller tensor.
example: SUM, MAX

MovementOps are virtual ops that operate on one tensor and move the data around
Copy-free with ShapeTracker.
example: RESHAPE, PERMUTE, EXPAND, etc...

...t how...where are your CONVs and MATMULs? Read the code to solve this mystery.

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Perspectives

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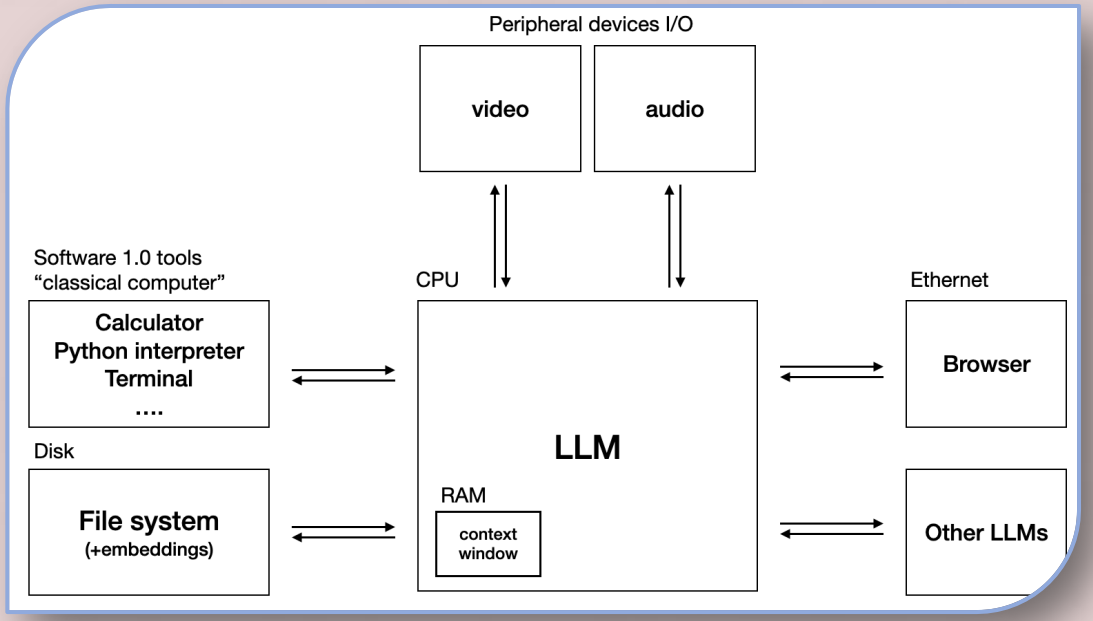
LLM-OS



Source: Andrej Karpathy/tweet

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AI Products

Rabbit R1

AI Pin

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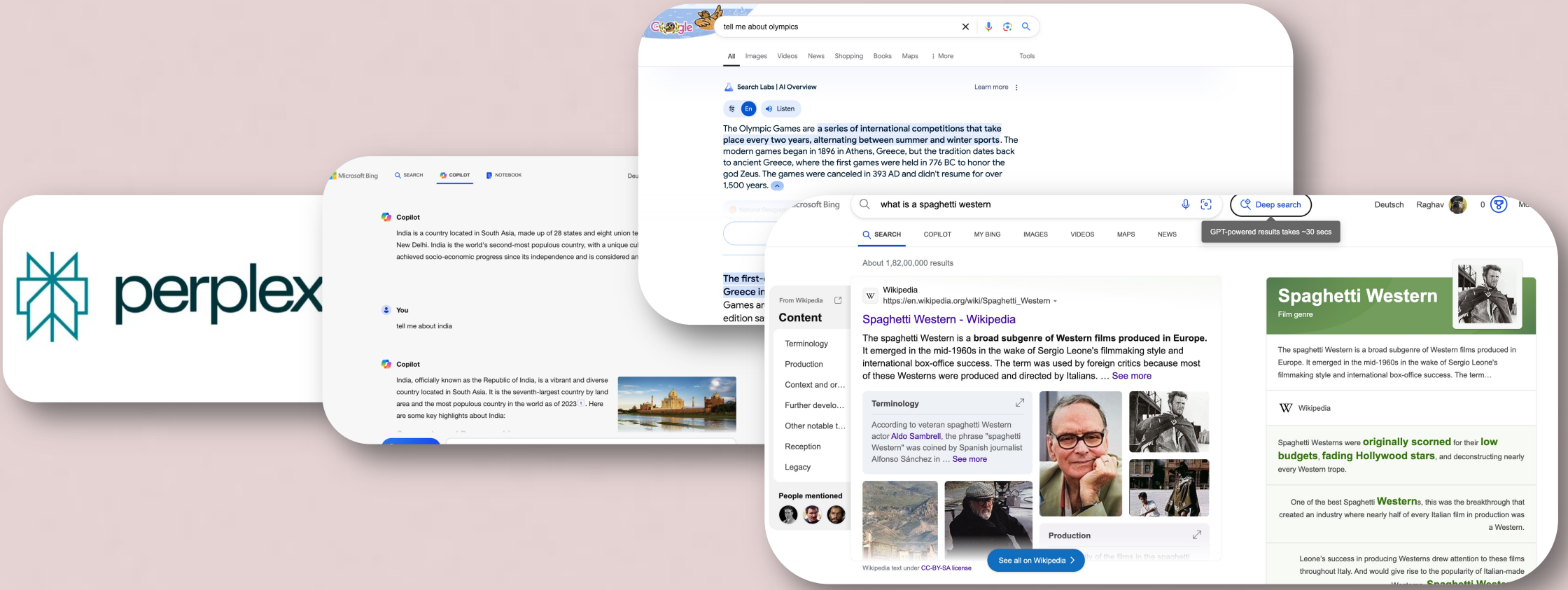
Search-GPT ?



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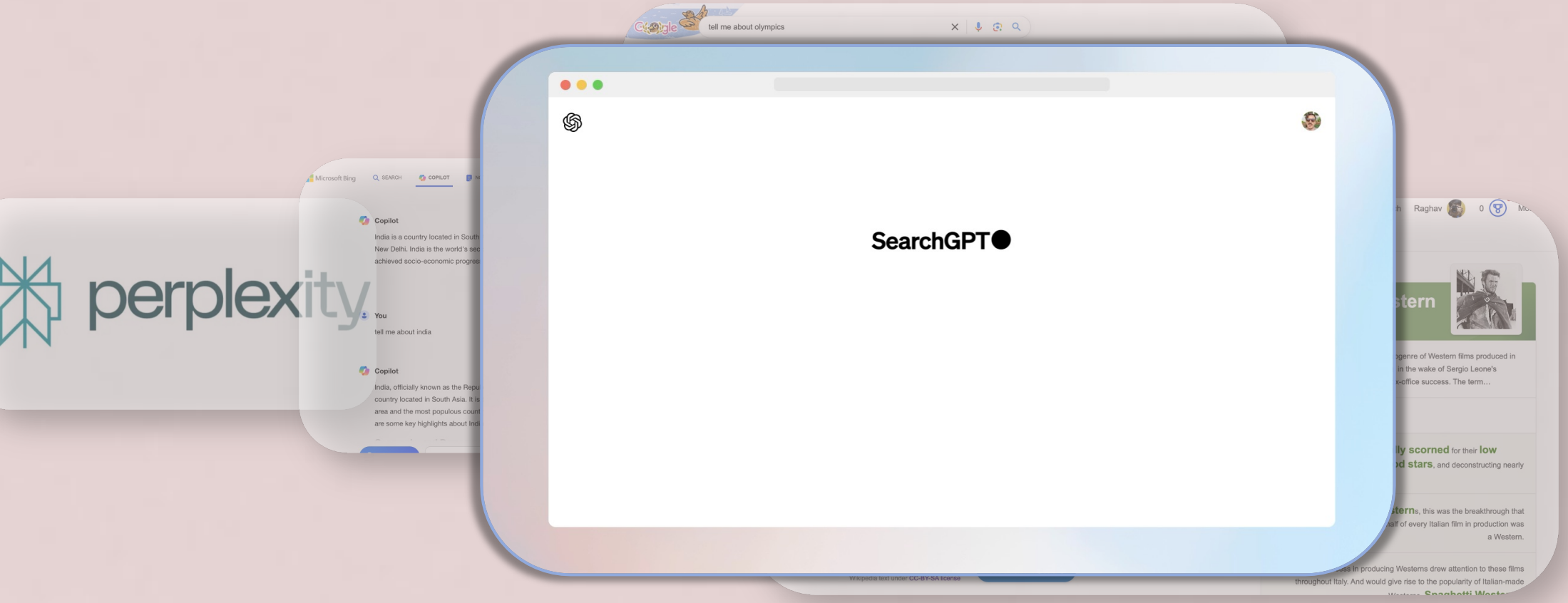
Search-GPT ?



Source: https://openai.com/index/searchgpt-prototype/

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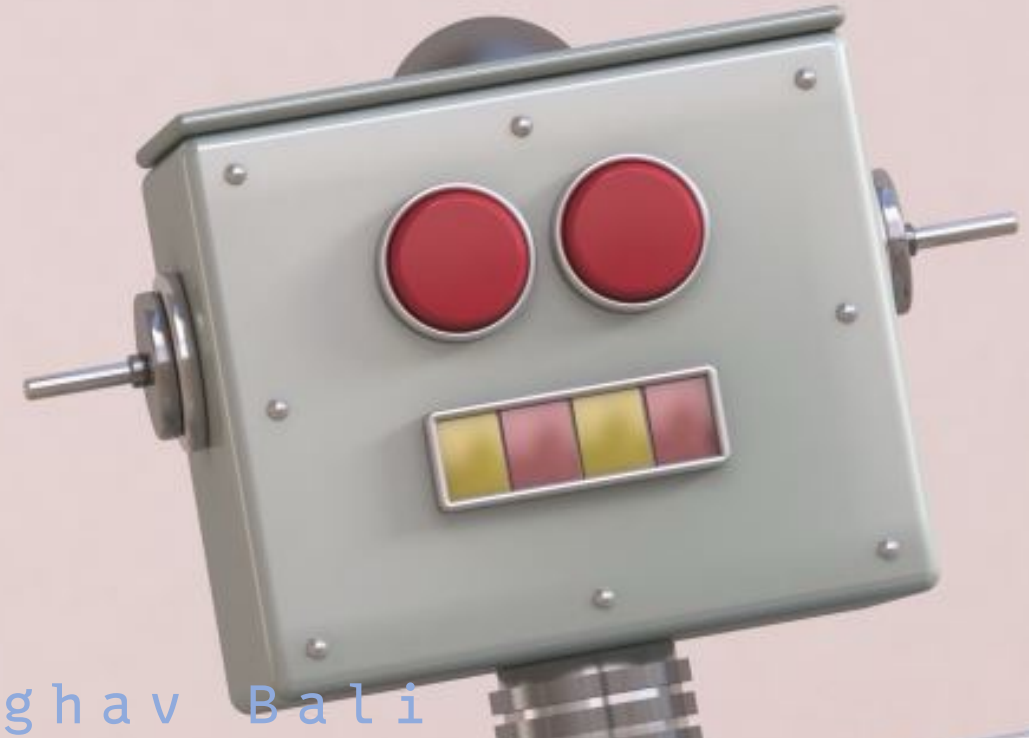
Maturity



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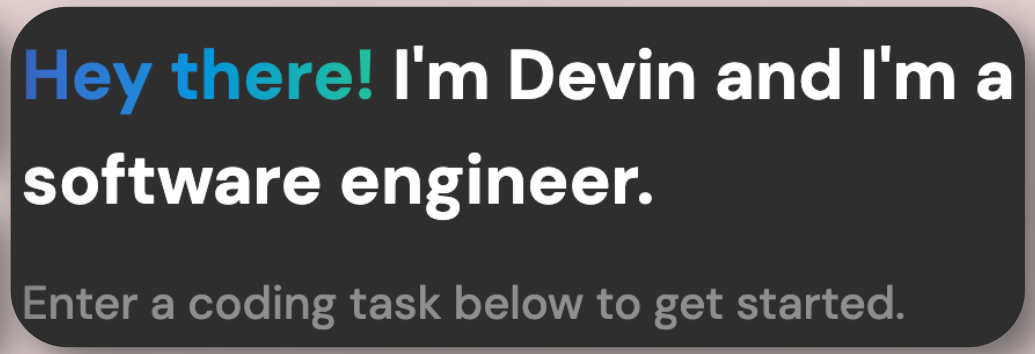
Maturity

LLMOps

Llama Guard 3

SynthID



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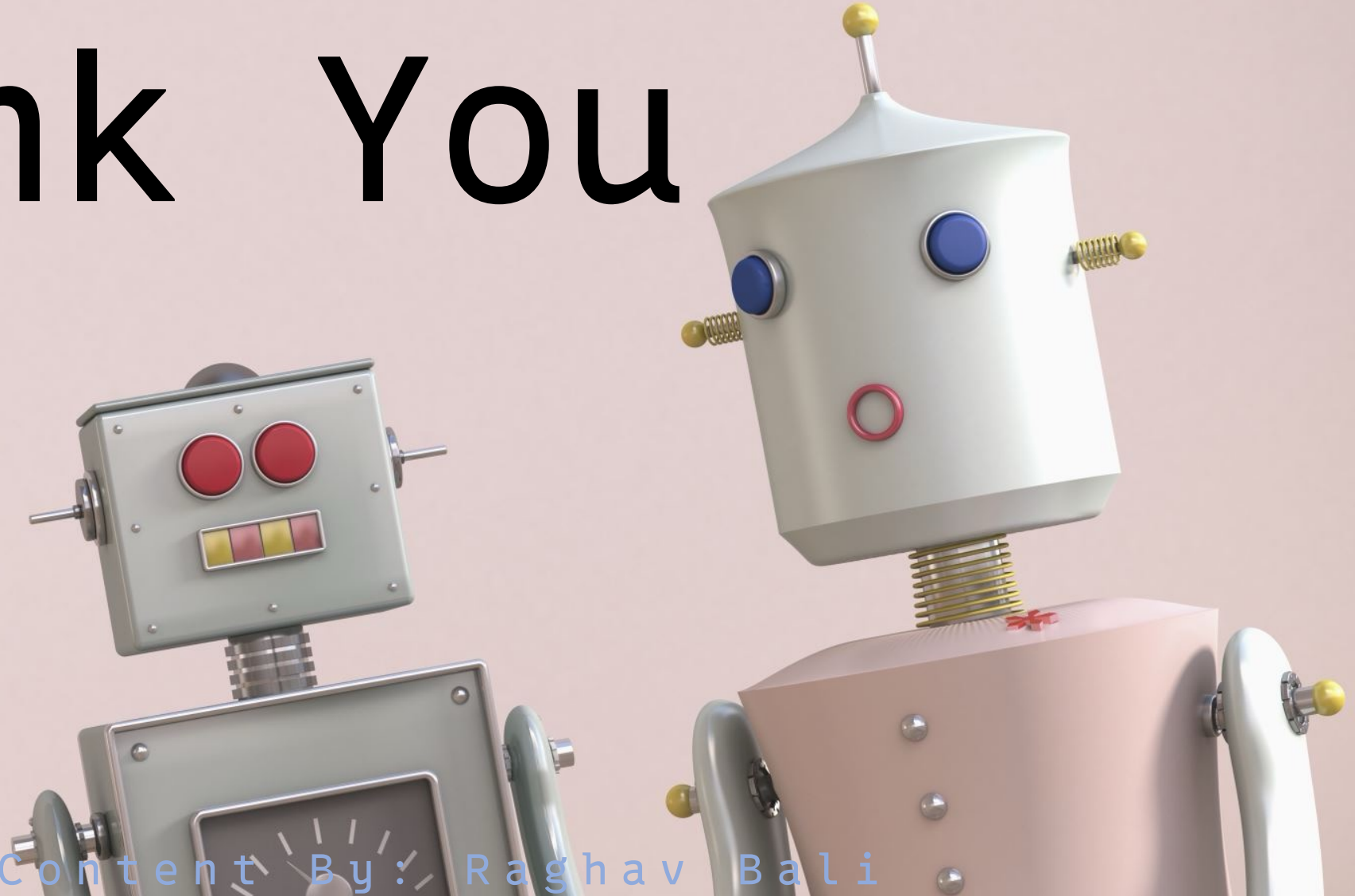
Thank You



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