DL Thinking 3

Konrad Kording and Lyle Ungar

In previous Deep Learning Thinking

We gave you rather narrow questions

Told you how to think about them

And you figured out loss functions (DLT 1)

And architectures (DLT 2)

Let’s take off the rails

We get the party started

You take it from there

Have a great discussion about the topic

Combine everything you learned during NMA DL into the discussion

And go beyond!

Future video TA guidance

Why does it matter if the data is not iid?

How does the future depend on the past? How is it independent?

What is the goal of curiosity?

Why is causality, and compositionality important?

How would you define continual learning?

Here is a relevant paper but it only scratches the surface: https://arxiv.org/abs/2201.07372

In context learning TA guidance

What is in context learning?

Why is it naturally the consequence of how we train LLMs?

Why does it work? How does the Transformer architecture help?

Can you link it more generally to meta-learning?

Check out: https://arxiv.org/abs/2211.15661 , https://arxiv.org/abs/2212.10559v2

Memories TA guidance

What kind of memories can you identify in yourself?

What are episodic memories? What are procedural memories? What are semantic memories?

How would you build each of these into a DL system?

Here are a few relevant papers: https://arxiv.org/abs/1410.5401, https://arxiv.org/abs/1805.07603, https://arxiv.org/abs/1703.03129

Multiple information sources TA guidance

How could a DL system interact with multiple information sources?

Which ones would help for choosing which clothes to wear?

How can a system combine such disparate information sources?

How would it summarize what comes out of tiktok. What comes out of instagram, what from youtube? Why would a combines system be better?

Recent projects :https://github.com/Significant-Gravitas/Auto-GPT , https://arxiv.org/abs/2302.14045, https://ai.googleblog.com/2023/03/palm-e-embodied-multimodal-language.html

Language for Robotics TA guidance

How can one break a problem into pieces?

How can one structure a meta-language? How to explain something to an AI system?

How can LLMs be combined with RL systems? What is special about language?

Why might English be good?

Papers: Look at this meta list: https://github.com/GT-RIPL/Awesome-LLM-Robotics

Wrapping up DL thinking

This is not a slide. This is just Konrad and Lyle.

Why it matters? Good approaches = those that use the information. Mention No free lunch.

What can we do? Ask questions of experts and ourselves

What should we listen for? Everything