

CS224V: Conversational Virtual Assistants with Deep Learning

Reading List

Fall 2024

1 Large Language Models (LLMs) Introduction

1.1 Pretraining LLMs

1. Attention (Vaswani et al., 2017) [Mandatory]
2. GPT-3 (Brown et al., 2020)
3. Instruct-GPT (Ouyang et al., 2022)
4. LLAMA (Touvron et al., 2023a)
5. Alpaca (Taori et al., 2023)
6. Alpaca with Self-Instruct (Wang et al., 2023e)
7. LLAMA-2 (Touvron et al., 2023b)

1.2 Prompting LLMs

1. Chain-of-thought (Wei et al., 2023)
2. Self-consistency (Wang et al., 2023d)
3. The Prompt Report: A Systematic Survey of Prompting Techniques (Schulhoff et al., 2024)

1.3 Tool Use

1. ToolFormer (Schick et al., 2023)
2. ART: Multi-step tool use (Paranjape et al., 2023)
3. Gorilla LM (Patil et al., 2023) [Mandatory]
4. ToolAlpaca (Tang et al., 2023)

2 Knowledge Curation

1. STORM: writing Wikipedia-like articles from scratch (Shao et al., 2024) [Mandatory]
2. Co-STORM: collaborative STORM (Jiang et al., 2024) [Mandatory]
3. Expository Text Generation: (Balepur et al., 2023)

3 Question-Answering on Free Text

3.1 Neural Information Retrieval Models

Non-neural algorithms: TF-IDF and BM-25.

Popular neural retrieval systems:

1. ColBERT (Khattab and Zaharia, 2020) [Mandatory]
2. Condenser (Gao and Callan, 2021)
3. CoCondenser (Gao and Callan, 2022)
4. CoCo-DR (Yu et al., 2022)
5. M3-Embedding (Chen et al., 2024)
6. RankGPT (Sun et al., 2023)

3.2 Retrieval + Generation

1. WikiChat: nearly hallucination-free Q&A grounded on Wikipedia. (Best Research of the Year, Wikimedia, 2024).(Semnani et al., 2023) [Mandatory]
2. Citation generation (Gao et al., 2023)
3. Active retrieval augmented generation (Jiang et al., 2023)

3.3 Evaluation

1. Evaluating Verifiability in Generative Search Engines (Liu et al., 2023a)
2. Generating Benchmarks for Factuality Evaluation (Muhlgay et al., 2023)
3. Evaluating Open-Domain Question Answering in the Era of Large Language Models (Kamalloo et al., 2023)

4 Question Answering on Databases, Knowledge Graphs, and Heterogeneous sources

1. SUQL: Structured and Unstructured Query Language (Liu et al., 2024b) [Mandatory]
2. Spinach: SPARQL-based Agent using an Agentic Approach (Liu et al., 2024a) [Mandatory]
3. GraphReader: Builds a graph from text and answers questions by navigating the graph (Li et al., 2024)
4. SPAGHETTI: SOTA for Compmix: WikiData, Wikipedia text and tables (Zhang et al., 2024) [Mandatory]
5. Compmix: a heterogeneous data set with WikiData and Wikipedia
6. BIRD: Text-to-SQL benchmark for LLMs (Li et al., 2023a) (Christmann et al., 2023)
7. ReFinED: Named Entity Disambiguation (NED) (Ayoola et al., 2022)

5 Task-Oriented Dialogue (ToD) Agents

5.1 English Agents

1. Reliable LLM-Based Conversational Agents (Joshi et al., 2024) [Mandatory]
2. MultiWOZ: the classic ToD dataset (Budzianowski et al., 2018)
3. ToD Agent Architecture (Campagna et al., 2022)

5.2 Multi-lingual Agents

1. Prompt-based LLM agent outperforms fine-tuning on X-RiSAWOZ, if evaluated properly (Lee et al., 2024)
2. RiSAWOZ: a well-annotated ToD dataset (Chinese) (Quan et al., 2020)
3. X-RiSAWOZ: a multilingual version of RiSAWOZ (Moradshahi et al., 2023) [Mandatory]

6 Social Agents

1. Zero-shot Persuasive Chatbots with LLM-Generated Strategies and Information Retrieval (Furumai et al., 2024) [Mandatory]
2. Controllable mixed-initiative dialogue generation through prompting (Chen et al., 2023)
3. Social Influence Dialogue Systems: A Survey of Datasets and Models For Social Influence Tasks (Chawla et al., 2023)
4. Persuasion for Good: Towards a Personalized Persuasive Dialogue System for Social Good (Wang et al., 2019)
5. Cardinal Chirpy (Chi et al., 2021)
6. Blenderbot (Shuster et al., 2022)

7 Learning Agents

Complex tasks require LLMs to refine themselves. Here are three use cases.

7.1 Qualitative Coding

1. GoLLIE (Sainz et al., 2023) [Mandatory]
2. Code4Struct: Code Generation for Few-Shot Event Structure Prediction (Wang et al., 2023c)
3. Document-Level Event Argument Extraction by Conditional Generation (Li et al., 2021)
4. InstructUIE (Wang et al., 2023b)

7.2 Web Agents

1. A web agent for universal tasks by remembering experiences in memory (Wang et al., 2024)
2. SeeAct: Vision web agents work well if we solve grounding on visual features (Zheng et al., 2024)
3. Russ: Grounding Open-Domain Instructions to Automate Web Support Tasks (Xu et al., 2021)
4. Mind2Web: Towards a Generalist Agent for the Web (Deng et al., 2024) [Mandatory]
5. DIY assistant: a multi-modal end-user programmable virtual assistant (Fischer et al., 2021)

7.3 Multimodal apps

1. ReactGenie: Adding a few lines to React programs for rich multimodal interactions (Yang et al., 2024b) [Mandatory]
2. GenieWizard: Using LLMs to define multimodal features (Yang et al., 2024a)

8 Formal Reasoning - Theorem Proving

1. SATLM: Translate NL into SAT (satisfiability) formulae and solve with theorem proving. (Ye et al., 2024)
2. Access control using SMT (satisfiability modulo theory) (Campagna et al., 2018)

9 Advanced Topics in LLMs

9.1 Distillation of LLMs

1. Chain-of-Thought distillation (Li et al., 2023b)
2. SCOTT: Self-consistent Chain-of-Thought distillation (Wang et al., 2023a)
3. Symbolic Commonsense Knowledge Distillation (West et al., 2022)
4. Knowledge Distillation of Large Language Models (Gu et al., 2023)
5. Self-Refine (Madaan et al., 2023)

9.2 Evaluation of LLMs

1. HELM (Liang et al., 2022),
2. Repairing the Cracked Foundation: A Survey of Obstacles in Evaluation Practices for Generated Text (Gehrmann et al., 2022)
3. Judging LLM-as-a-judge with MT-Bench and Chatbot Arena (Zheng et al., 2023)
4. G-Eval: NLG Evaluation using GPT-4 with Better Human Alignment (Liu et al., 2023b)

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