

## Kurs Abstract

Conversational AI. Dialogsysteme, Bots, Assistenten.

Im Seminar werden detailliert die Grundlagen und jüngere Entwicklungen zur sogenannten Conversational AI besprochen. Entlang der Hauptkomponenten von Dialogsystemen, Eingabekanal, Sprachverstehen, Dialogmanagement, Sprachgenerierung, und Ausgabekanal werden Varianten, Frameworks und Implementierungsstrategien vorgestellt. Dabei werden neben den theoretischen Konzepten sowohl neuere Ergebnisse der Forschung als auch die Entwicklungen der letzten Jahre in der Industrie berücksichtigt. Insbesondere sind natürlich auch die allerjüngsten Entwicklungen im Bereich generative AI zu betrachten. Hier wird das Seminar herausarbeiten welche Methoden durch den Durchbruch der General Pretrained Transformers vor allem in der für Konversation getunten Form obsolet werden, welche neuen Möglichkeiten sich erschließen. Da Einiges dafür spricht, dass wir hier Zeitzeug:innen einer wissenschaftlichen Revolution sind, sollen auch wissenschaftstheoretische, gesellschaftliche, juristische und ethische Aspekte betrachtet werden.

Teilnahmekriterium: Vortrag + Ausarbeitung als Hausarbeit oder Programmierprojekt wenn mit AI gemacht einschließlich Arbeitsprozess, Prompting Dokumentation etc.  
Bewertung: 40% Vortrag, 40% Hausarbeit, 20% Beteiligung.

Semester 13. Oktober – 07. Februar

**16.10. Vorstellung der Teilnehmer:innen. Überblick zum Seminar, Kursverlauf. Welche Inhalte sind denn Interessant? Scientific Revolution Paper.**

**23.10. Einführung zu Conversatioal AI. History. Conversation Theory. Grice.**

**30.10. Conversational AI. Status. Sparks of Intelligence Paper. Sutton Paper. Paper zu AI in Education.**

**06.11. LLMs as Basis for new era of Conversational AI. Foundation Book. Statistics Paper. Small Modells.**

**13.11. Practical overview: Langchain, LLM access, industrial examples**

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20.11. **Grounding/Hallucination/Guardrails, Evaluation of LLMs**  
**Open AI Hallucination Paper. RAGs Retrieval.**

27.11. **Agents + Task oriented Bots.** Theory. Frameworks. Evaluation. Tuning.

04.12. **Small Models Overview, Selfhosting of LMMs, Serving Bots. Connect to**  
**Langchain**

11.12. **Reasoning Models, Memory Domain Finetuning, Reinforcement Learning**

18.12. **Wrap up 2025 and Plan for Rest of Term**

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08.01. **Impact on the academic System, Societal impact ethical considerations:**  
**Discussion + practical Knowledge AI Act**

15.01. **Memory, Knowledge Graphs, Perspective on AGI**

22.01. **Industrial Applications, Industrial Frameworks. Predictions on the Labor**  
**Market**

29.01. Conversational AI as Decider. Conversational AI as Coach, Psychologist,  
Friend, etc. : **Emotions, Speech**

05.02. **Wrap up**

Material:

**16.10. Vorstellung der Teilnehmer:innen. Überblick zum Seminar, Kursverlauf. Welche Inhalte sind denn interessant.**

**Vasant Dhar: The Paradigm Shifts in Artificial Intelligence**

**OECD: What should teachers teach and students learn in a future of powerful AI?**

**23.10. Einführung zu Conversational AI. History. Conversation Theory. Scientific Revolution Paper. Grice Paper.**

**Jurafsky Kap 25** Conversation and its Structure

**Grice: Conversational Theory**

The Conversational Interface Kap 2,3,4, Mc Tear et al

A brief history of chatbots Tomáš Zemčík

A Survey on Dialogue Systems: Recent Advances and New Frontiers Hongshen Chen et al.

**30.10. Conversational AI. Status.**

Sebastien Bubeck et.al. **Sparks of Artificial General Intelligence: Early experiments with GPT-4**

Rich Sutton: The Bitter Lesson

D Silver, RS Sutton [Welcome to the era of experience](#)

Michael Gerlich : AI Tools in Society: Impacts on Cognitive Offloading and the Future of Critical Thinking

**06.11. LLMs as Basis for new era of Conversational AI. Foundation Book. Statistics Paper. Small Modells.**

**Jurafsky/Martin Kap 9/10**

Tong Xiao and Jingbo Zhu Foundations of Large Language Models

Weijie Su Do Large Language Models (Really) Need Statistical Foundations?

**13.11. Practical overview: Langchain, LLM access, industrial examples, customization**

Ben Auffarth: Generative AI with Langchain

Google, Deepmind overview

Meta overview

Deepseek, Alibaba Overview

Jiongnan Liu: LLMs + Persona-Plug = Personalized LLMs

### **20.11. Grounding/Hallucination/Guardrails, Evaluation of LLMs Open AI Hallucination Paper, Retrieval RAGs**

Ziwei Ji et al.:

Survey of hallucination in natural language generation.

David McAllester Robert E. Schapire: On the Convergence Rate of Good Turing Estimators

Adam Tauman Kalai\* Ofir Nachum Santosh S. Vempala† Edwin Zhang Why Language Models Hallucinate

Hsiu-Yuan Huang, Yutong Yang, Zhaoxi Zhang, Sanwoo Lee, Yunfang Wu: A Survey of Uncertainty Estimation in LLMs: Theory Meets Practice

Zhengbao Jiang et al.: Active Retrieval Augmented Generation

Carolin Holtermann: Around the World in 24 Hours Probing LLM Knowledge of Time and Place

### **27.11. Agents + Task oriented Bots**

Minjie Shen et al. From Mind to Machine: The Rise of Manus AI as a Fully Autonomous Digital Agent

Weidi Lua et al. AGrail: A Lifelong Agent Guardrail with Effective and Adaptive Safety Detection

Xunjian Yin GANodel Agent: A Self-Referential Agent Framework for Recursively Self-Improvement  
Langgraph Tutorial

#### 04.12. **Small Models Overview, Selfhosting of LMMs, Embodied AI**

Practical installations with Qwen, SmoLL, vertex small etc.

<https://medium.com/@anicomanesh/creating-llm-powered-research-assistant-with-langchain-faiss-and-gemma-2-878d1a15fd3b>

<https://cloud.google.com/blog/products/application-development/run-your-ai-inference-applications-on-cloud-run-with-nvidia-gpus>

Yaowei Zheng et al: LLAMAFACTORY: Unified Efficient Fine-Tuning of 100+ Language Models

Fanlong Zeng et al :Large Language Models for Robotics: A Survey

Ning Ding: Fusing Highly Specialized Language Models for Comprehensive Expertise

#### 11.12. **Reasoning Models, Domain Finetuning. Reinforcement Learning, Memory**

State of Reasoning Models End 2025. Lit on GPT5 & Co

Xixi Wu et al: ReSum: Unlocking Long-Horizon Search Intelligence via Context Summarization

Arkadiusz Modzelewski: PCoT: Persuasion-Augmented Chain of Thought for Detecting Fake News and Social Media Disinformation

Memory Mechanisms in Langchain Tutorial

Yitao Liu:Contextual Experience Replay for Self-Improvement of Language Agents

Junde Wu: Agentic Reasoning: A Streamlined Framework for Enhancing LLM Reasoning with Agentic Tools

YunhaoWang: Adaptive Deep Reasoning: Triggering Deep Thinking When Needed

#### 18.12. **Wrap up 2025 and Plan for Rest of Term. Ev Voice. Ev some discussion materials**

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08.01. **Impact on the academic System, Societal impact ethical considerations: Discussion + practical Knowledge AI Act**

Yogesh K. Dwivedi et al. Opinion Paper: “So what if ChatGPT wrote it?”  
Multidisciplinary perspectives on opportunities, challenges and implications  
of generative conversational AI for research, practice and policy

Evangelos Katsamakos; Artificial intelligence and the transformation of higher  
education institutions

The Future of Artificial Intelligence and the Mathematical and Physical Sciences  
(AI+MPS) Community Paper from the NSF Future of AI+MPS Workshop

Hao-Ping (Hank) Lee: The Impact of Generative AI on Critical Thinking: Self-  
Reported Reductions in Cognitive Effort and Confidence Effects From a Survey of  
KnowledgeWorkers

Zhen Sun Are We in the AI-Generated Text World Already? Quantifying and  
Monitoring AIGT on Social Media

Applied AI: AI Act Governance: Best Practices for Implementing the EU AI Act

Robert Sparrow: Bullshit universities: the future of automated education

### **15.01. Memory, Knowledge Graphs, Perspective on AGI**

Jinhao Jiang: KG-Agent: An Efficient Autonomous Agent Framework for Complex  
Reasoning over Knowledge Graph

Edward Hughes et al. :Open-Endedness is Essential for Artificial Superhuman  
Intelligence

Luc Steels: An Experiment in Measuring Understanding

Haoran Ye:Generative Psycho-Lexical Approach for Constructing Value Systems in  
Large Language Models

### **22.01. Industrial Applications, Industrial Frameworks. Predictions on the Labor Market**

Xiao Xia: SceneGenAgent: Precise Industrial Scene Generation with Coding Agent

Fabrizio Dell’Acqua: The Cybernetic Teammate: A Field Experiment on Generative  
AI Reshaping Teamwork and Expertise

Fabrizio Dell'Acqua: Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality

Yijia Shao: Future of Work with AI Agents: Auditing Automation and Augmentation Potential across the U.S. Workforce

### **29.01. Conversational AI as Decider. Conversational AI as Coach, Psychologist, Friend, etc. : Emotions, Speech**

Different Applications.

Antonia Karamolegkou: Evaluating Multimodal Language Models as Visual Assistants for Visually Impaired Users

*Yizhe Yang*: CAMI: A Counselor Agent Supporting Motivational Interviewing through State Inference and Topic Exploration

Haitao Li LegalAgentBench: Evaluating LLM Agents in Legal Domain

Dongjun Lim :Plutchik's Theory with Mixture of Experts for Enhancing Emotion Classification

Minh Duc Chu : Illusions of Intimacy: Emotional Attachment and Emerging Psychological Risks in Human-AI Relationships

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### **05.02. Wrap up**

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Weiteres Material folgt.