

Course Title: Mastering Prompt Engineering: Techniques and Best Practices for AI Language Models

I. Introduction to Prompt Engineering

- A. Definition and overview of prompt engineering
- B. Importance of prompt engineering in AI language models
- C. Challenges and opportunities in prompt engineering

Suggested Reading:

1. Radford, A., et al. "Language Models are Few-Shot Learners." OpenAI, 2020.
2. Brown, T.B., et al. "AI Dungeon: Exploring Large Generative Language Models Through Interactive Play." NeurIPS, 2021.

II. Foundations of Prompt Engineering

- A. Understanding AI language models
 1. Transformer-based models (GPT, BERT)
 2. Autoregressive and autoencoding models
- B. Key concepts in natural language understanding and generation
- C. Techniques for effective human-AI collaboration

Suggested Reading:

1. Vaswani, A., et al. "Attention is All You Need." NeurIPS, 2017.
2. Devlin, J., et al. "BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding." NAACL-HLT, 2019.

III. Principles of Effective Prompt Design

- A. Clear and concise instructions
- B. Specifying desired output format
- C. Implicit and explicit context
- D. Techniques for controlling verbosity and focus
- E. Utilizing examples and demonstrations

Suggested Reading:

1. OpenAI. "How to Make Good Prompts for GPT-3." OpenAI Blog, 2020.
2. Tam, D. "An Introduction to Prompt Engineering." Towards Data Science, 2021.

IV. Advanced Prompt Engineering Techniques

- A. Iterative prompt refinement
- B. Systematic experimentation and evaluation
- C. Conditional and dynamic prompts
- D. Leveraging model-specific features and capabilities
- E. Adapting prompts for multi-turn interactions

Suggested Reading:

1. Gao, X., et al. "Making Pre-trained Language Models Better Few-shot Learners." arXiv, 2021.
2. Nie, Y., et al. "Adapting Open Domain Fact Extraction and Verification to COVID-FACT through In-Domain Language Modeling." ACL, 2021.

V. Applications of Prompt Engineering

- A. Content generation and summarization
- B. Question-answering and information retrieval
- C. Sentiment analysis and emotion recognition
- D. Machine translation and multilingual models

E. Assisting in creative tasks (e.g., poetry, storytelling)

Suggested Reading:

1. GPT-3 Creative Fiction. "Crafting Stories with GPT-3." GPT-3 Creative Fiction, 2020.
2. Zhang, R., et al. "PEGASUS: Pre-training with Extracted Gap-sentences for Abstractive Summarization." ICML, 2020.

VI. Evaluation and Metrics for Prompt Engineering

A. Objective evaluation methods

B. Subjective and user-centered evaluation

C. A/B testing and experimentation

D. Identifying and addressing biases

Suggested Reading:

1. Liu, Y., et al. "RoBERTa: A Robustly Optimized BERT Pretraining Approach." arXiv,