SUMMER OF SCIENCE 2025

LARGE LANGUAGE MODELS

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Plan of Action with resources:

Week 1:
Learn the basics of large language models, their applications, and core machine learning concepts like regression, classification, and clustering.
https://medium.com/@thefrankfire/building-basic-intuition-for-large-language-models-llms-91f7ca92dfe7

https://medium.com/@llmforce/the-essential-skills-for-large - language-model-development-what-you-need-to-know-3674eff9072d

https://www.coursera.org/learn/machine-learning

Week 2:

Explore deep learning fundamentals including feedforward

networks, CNNs, RNNs, optimization, and regularization techniques.

https://www.deeplearningbook.org/

Week 3, Week 4:

Understand natural language processing concepts like word embeddings, RNNs, attention mechanisms, and transformer-based models.

https://web.stanford.edu/class/cs224n

/ Mid-term Submission

Week 5:

Learn the transformer architecture in detail, including self-attention, positional encoding, and the encoder-decoder structure.

https://jalammar.github.io/illustrated-transformer/

Week 6:

Explore how LLMs are used in generative AI tasks like chatbot development, prompt engineering, and fine-tuning.

https://www.coursera.org/learn/generative-ai-with-llms

Week 7:

Study advanced LLMs like BERT, T5, and GPT-3, focusing on architecture, pretraining strategies, evaluation, and ethical use.

https://www.cs.princeton.edu/courses/archive/fall22/cos597G/

Week 8:

Read about GPT-4's capabilities, architecture, and alignment techniques, and apply your knowledge to build a mini chatbot.

https://openai.com/research/gpt-4

End-term Submission