CS 696 Applied Large Langauge Models
Spring Semester, 2025
Doc 1 Introduction
Jan 21, 2025

Prerequisites

CS 450 or CS 549 or consent of instructor

What you need to know or do
  Python coding
  Basic knowledge of neural networks

University Deadline & Important Dates

Jan 27

  Last day of Waitlist

Jan 28 - Feb 3

  Adding class by permission number only

Feb 3

  Add/Drop deadline
  Last day to file for graduation

Feb 17

  Last day to petition for course withdrawal without W on transcript

Mar 28

  Thesis submission soft deadline
  "have the best likelihood for graduation in spring 2025"

May 8

  Last day to submit comprehensive exams results
  Last day to Last day to petition for course withdrawal

About Me

Retired professor

Graduate Advisor

Associate Chair of the department

Administrative duties for the last 4 semesters

696 Limits

There are limits to how many 596 & 696 course you can take

If a 696 or 596 course becomes a regular course
   You take as 596/696
   We don't count it towards the limit

In the fall, the following 696 courses become regular courses

   CS 663 Algorithms for Big Data
   CS 654 Reinforcement Learning
   CS 668 Applied Large Language Models

Why this Course

Technology change is increasing and having a bigger impact on society

The future has already arrived. It's just not evenly distributed yet
William Gibson

The world you grew up in does not exist anymore

We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run.

A generative model for inorganic materials design

After fine-tuning, MatterGen successfully generates stable, novel materials with desired chemistry, symmetry, as well as mechanical, electronic and magnetic properties.

Douglas Adams

"I've come up with a set of rules that describe our reactions to technologies:

1. Anything in the world when you're born is normal and ordinary and is just a natural part of how the world works.

2. Anything that's invented between when you're fifteen and thirty-five is new and exciting and revolutionary and you can probably get a career in it.

3. Anything invented after you're thirty-five is against the natural order of things."

Experimental Course

New rapidly changing area

First time teaching the course

Course Goals

- Create and evaluate a pipeline/workflow to train a large language model (LLM).

- Select and prepare datasets for LLM training.

- Test and debug LLMs

- Evaluate the effectiveness of an LLM.

- Finetune an existing LLM for specific usage.

- Develop and embed LLM clients in applications.

- Recommend pipelines and base models for LLMs for specific uses

- Compose effective prompts for LLMs

What You Will Do

Create a LLM

Fine Tune a LLM

Evaluate LLMS

Create an LLM client

Use prompt engineering develop an application

Scale Changes Everything

Deliverables

3 - 5 assignments

One Exam

Project

Course Website & Canvas

Course Website

www.eli.sdsu.edu/courses   Follow the links

https://eli.sdsu.edu/courses/spring25/cs696/index.html

Lecture Notes
Assignments
Syllabus
Reading Assignments

Canvas
Announcements
Ask questions
Turn in assignments

Textbooks

Speech and Language Processing, Dan Jurafsky and James H. Martin
    https://web.stanford.edu/~jurafsky/slp3/

On-line through O'Reilly's Media at https://learning.oreilly.com/home/

    Build a Large Language Model (from Scratch), Raschka, Sept 24

    Designing Large Language Model Applications, Pai, Mar 25

    Prompt Engineering for Generative AI, Phoenix & Taylor, May 24

https://www.oreilly.com/

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I'm with: San Diego State University ⌄

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Sign in with password

Having trouble signing in? Contact **support@oreilly.com**.

Project Ideas

Wide range of options

Fine-tune existing model for specialized task

      Compare the performance of existing LLMs

      Develop techniques for more accurate output

      Develop LLM to aid learning