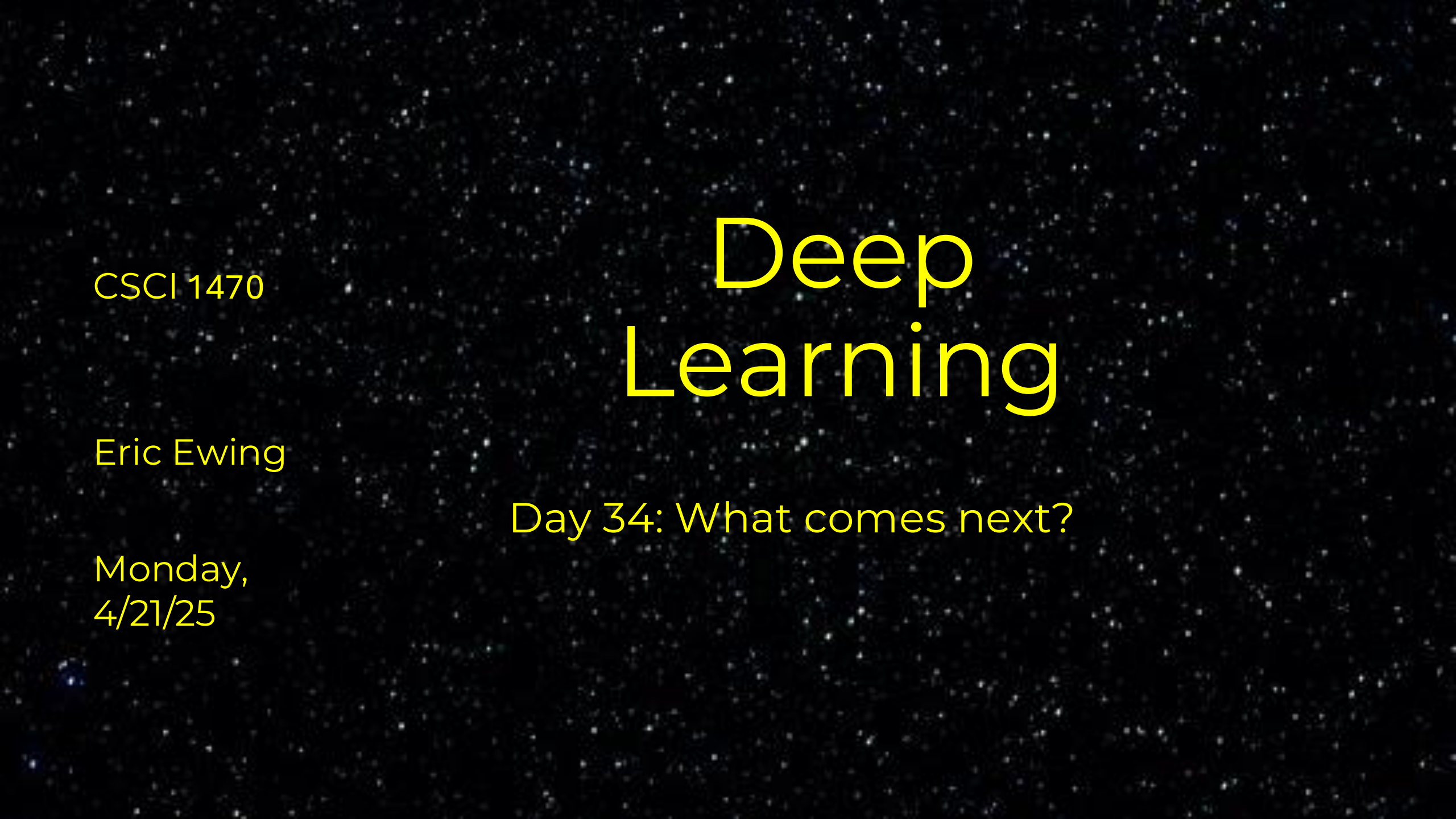


Deep Learning

Day 34: What comes next?

CSCI 1470

Eric Ewing

Monday, 4/21/25

Logistics

DL Day, April 30th

- 3 timeslots throughout the day
  - 10-11:30, 12:00-1:30, 2:00-3:30
- Fill out form on Ed to indicate timeslot that works best for your group (i.e., the one where the most people can make it)
- Poster printer in CIT has limited hours this year 8:30-4:30. We (staff) will be printing posters the 28th and 29th, if you want to wait until the 30th and risk it, that's up to you.

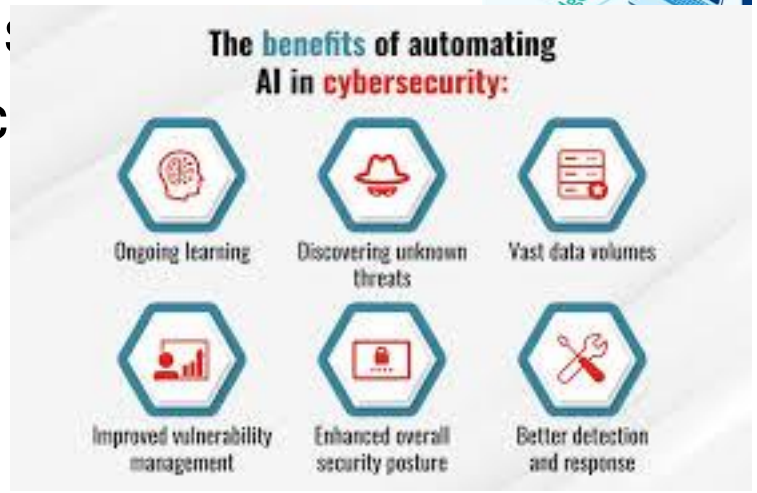
Logistics

1470 will be offered again in the Fall and we’re looking for TAs!

Trends in Deep Learning Jobs

1. Generative Models

2. Edge AI, connected devices
- Can your AI run on limited c



4. Deep Learning Infrastructure (Hardware or Cloud Compute)

Deep Learning (or Adjacent) Jobs

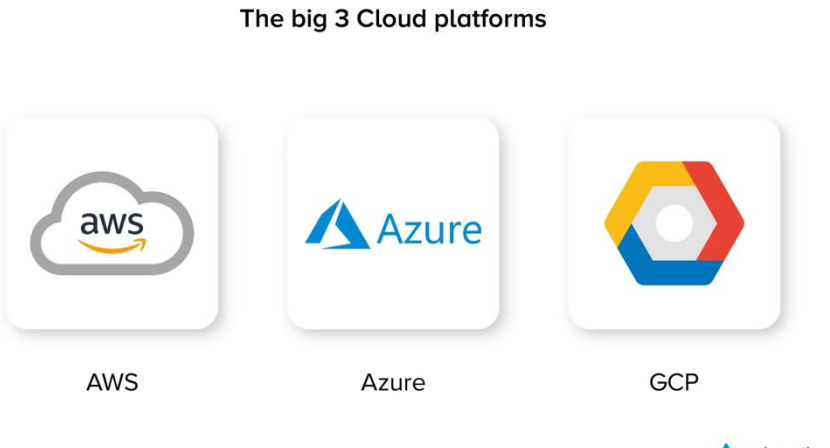
- Data Scientist
  - Process and analyze large amounts of data
  - Find and validate trends in data, “Actionable Insights”
- Machine Learning Engineer
  - Build and maintain data pipeline for machine learning models
  - Implement and optimize ML/DL models
  - Evaluating Models
- Machine Learning Researcher
  - Research and implement **new** architectures, optimizers, or other techniques
- “Topic Specific” Jobs (e.g., Computer Vision, Fine-tuning LLMs, startups, etc.)

Skills You've Gained

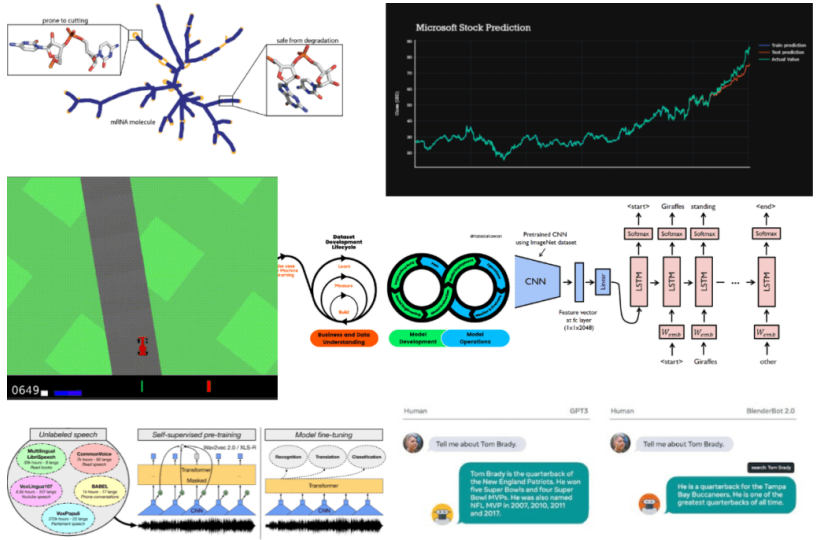
- Foundations of linear algebra, optimization, and probability
- Data processing
- Neural network architectures
- Practical training skills (e.g., managing overfitting/underfitting, hyperparameter tuning)
- Going from math/slides to code

Skills You Should Cultivate

- Use of popular training infrastructures

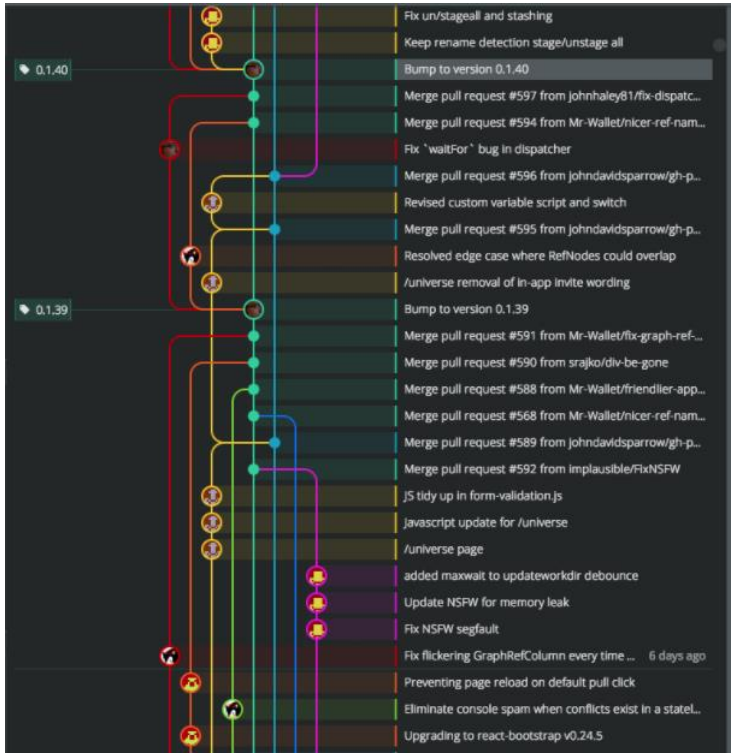


- What is the right technique to use for your problem?

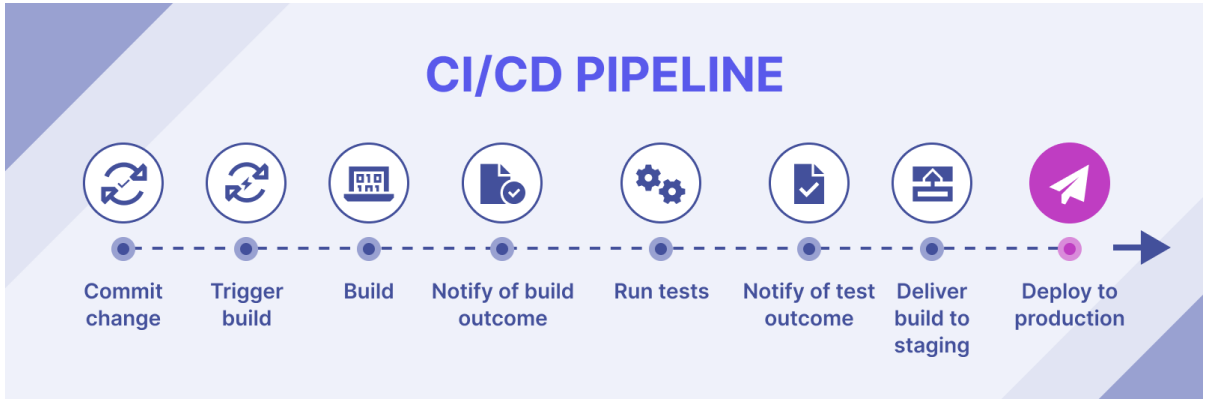


Skills You Should Cultivate

- Know how to use git (more than just commit, push, and pull)



- CI/CD pipelines

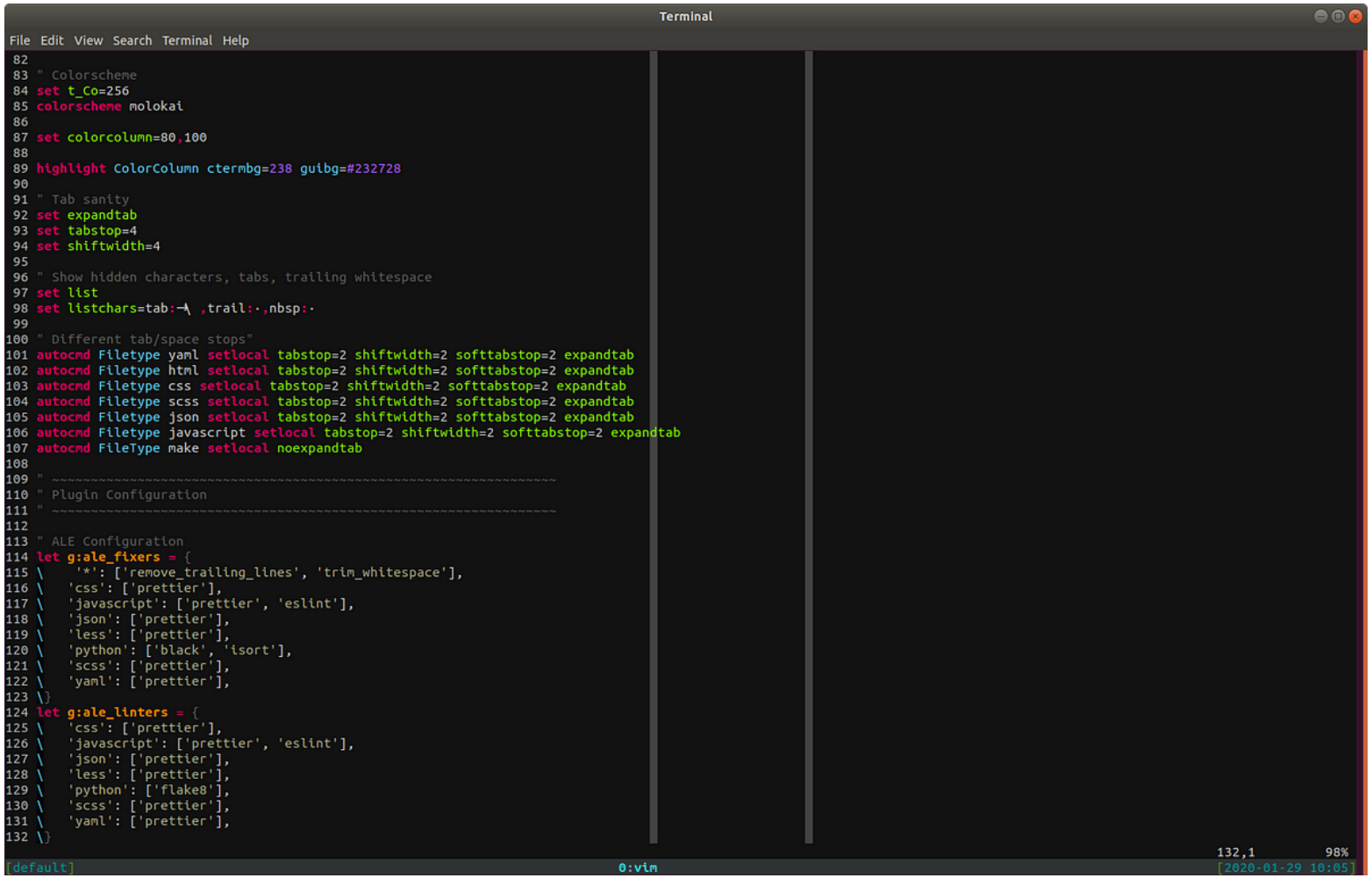


Skills You Should Cultivate

Vim

Just Kidding

(Not Really)



https://www.vimgolf.com/

Build a Portfolio

- Portfolios matter!
  - Demonstrates practical skills beyond theoretical knowledge
  - Shows ability to complete projects from conception to deployment
  - Acts as tangible proof of your capabilities
- Essential Portfolio Components
  - GitHub repository with well-documented code
  - Personal website showcasing projects
  - Variety of projects demonstrating range of skills
- Ideally shows a mix of breadth in many topics and depth in a certain topic

What Type of Projects to do?

- A bit easier to say what not to do:
  - Don’t make another CNN for MNIST or CIFAR
  - Don’t find a popular reddit post or medium article describing “Top 5 projects for your DL Portfolio”
- Projects are evaluated for creativity first and then technicality
  - The first person who looks at your portfolio won’t be able to evaluate your technical ability, you must draw them in
- A portfolio doesn’t have to be perfectly cohesive
  - Follow your short-term nose

What Type of Projects to do?

- (At least part of) your portfolio should match the jobs you are applying for
  - If you are applying for a ML-Engineer or data science position, you **shouldn't** work only with perfectly clean data (e.g., Kaggle datasets)
- Do what interests **you**
  - You will work harder and create better results if you are **genuinely interested** in your project
- If you're interested in grad school, get involved in research
  - If you're in grad school, try doing research

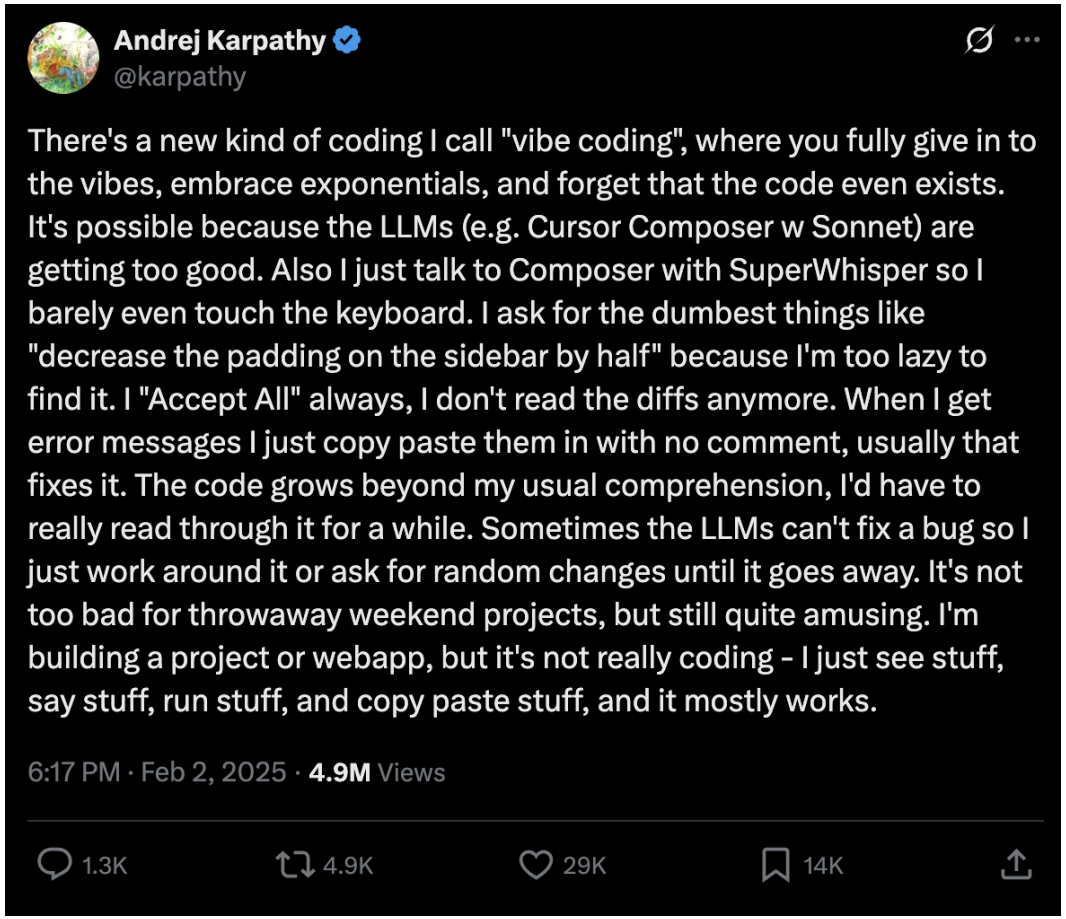
Research Needs a Special Sauce

- There are lots of people doing research in AI
  - Be wary of problems you know thousands of people are working on
  - Don’t try to make a better CNN for ImageNet
- Research needs something special:
  - A technique that other people haven’t thought of applying to this problem yet
  - A dataset that other people don’t have access to

Harder, but more impactful

Easier, but potentially isolated impact

Should I Use LLMs to Build my Portfolio?



Should I Use LLMs to Build my Portfolio?

The Impact of Generative AI on Critical Thinking: Self-Reported Reductions in Cognitive Effort and Confidence Effects From a Survey of Knowledge Workers

Hao-Ping (Hank) Lee
Carnegie Mellon University
Pittsburgh, Pennsylvania, USA
haopingl@cs.cmu.edu

Advait Sarkar
Microsoft Research
Cambridge, United Kingdom
advait@microsoft.com

Lev Tankelevitch
Microsoft Research
Cambridge, United Kingdom
levt@microsoft.com

Ian Drosos
Microsoft Research
Cambridge, United Kingdom
t-iandrosos@microsoft.com

Sean Rintel
Microsoft Research
Cambridge, United Kingdom
serintel@microsoft.com

Richard Banks
Microsoft Research Cambridge
Cambridge, United Kingdom
rbanks@microsoft.com

Nicholas Wilson
Microsoft Research
Cambridge, United Kingdom
niwilson@microsoft.com

Should I Use LLMs to Build my Portfolio?

My Take: If you want a job in ML, ***you*** should do the machine learning

If you want a job as a ML engineer, you shouldn't only work with perfectly clean data

If you want to showoff your ML project as part of a webapp, it's reasonable to automate building the frontend.

Any Questions?