

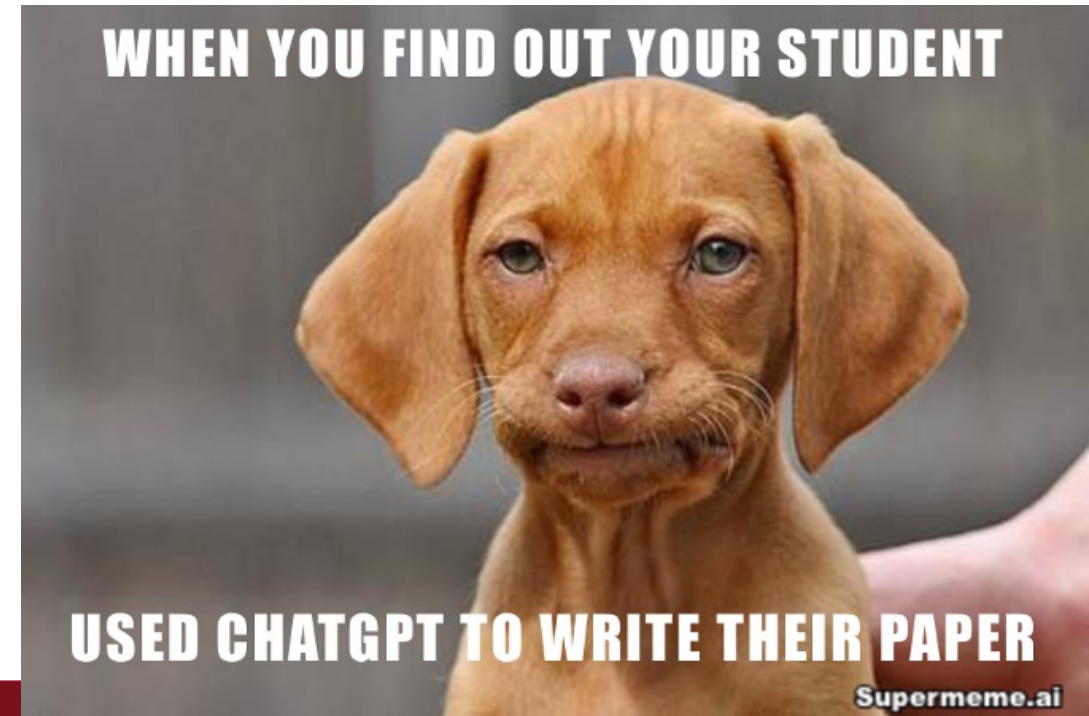
CSCI 5541: Natural Language Processing

Project Guideline

https://dykang.github.io/classes/csci5541/S24/hw/CSCI_5541_S24_Project_Description.pdf

Dongyeop Kang (DK), University of Minnesota

dongyeop@umn.edu | twitter.com/dongyeopkang | dykang.github.io



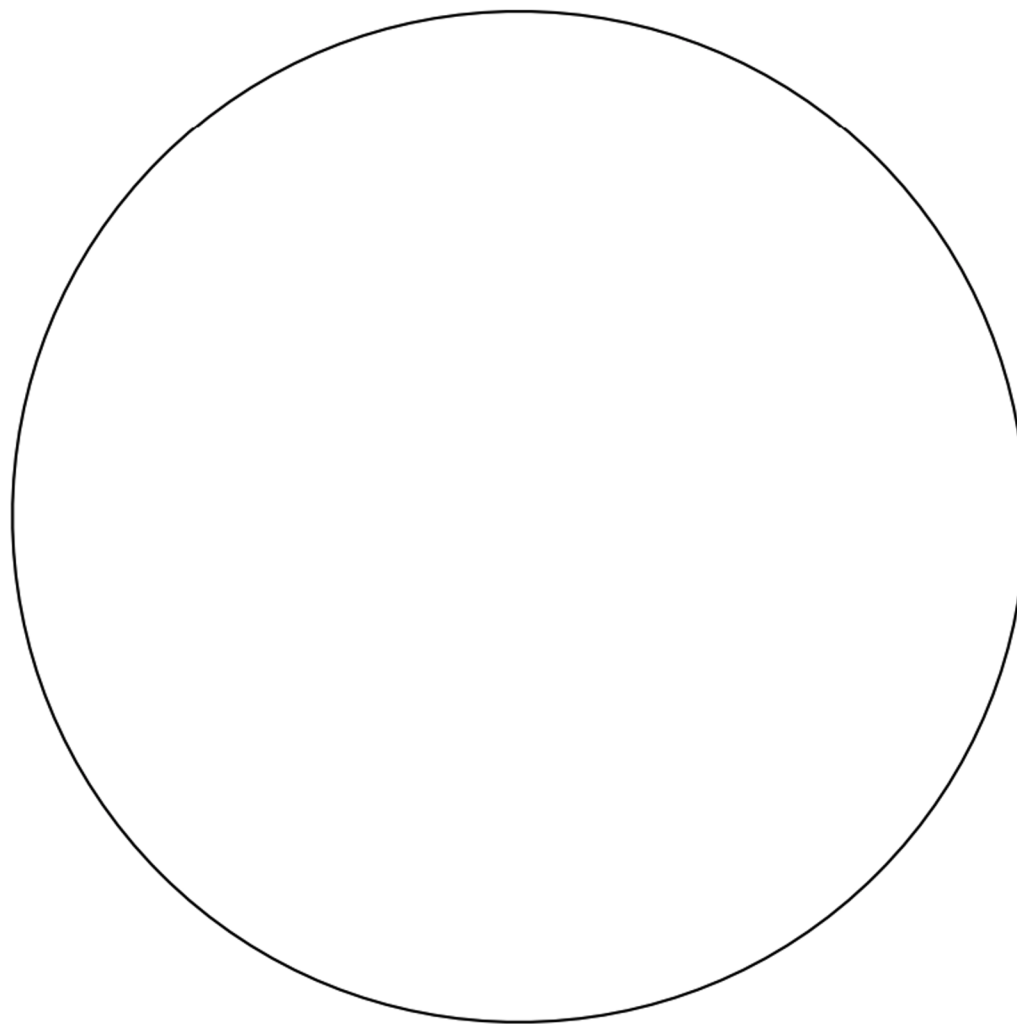
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Outline

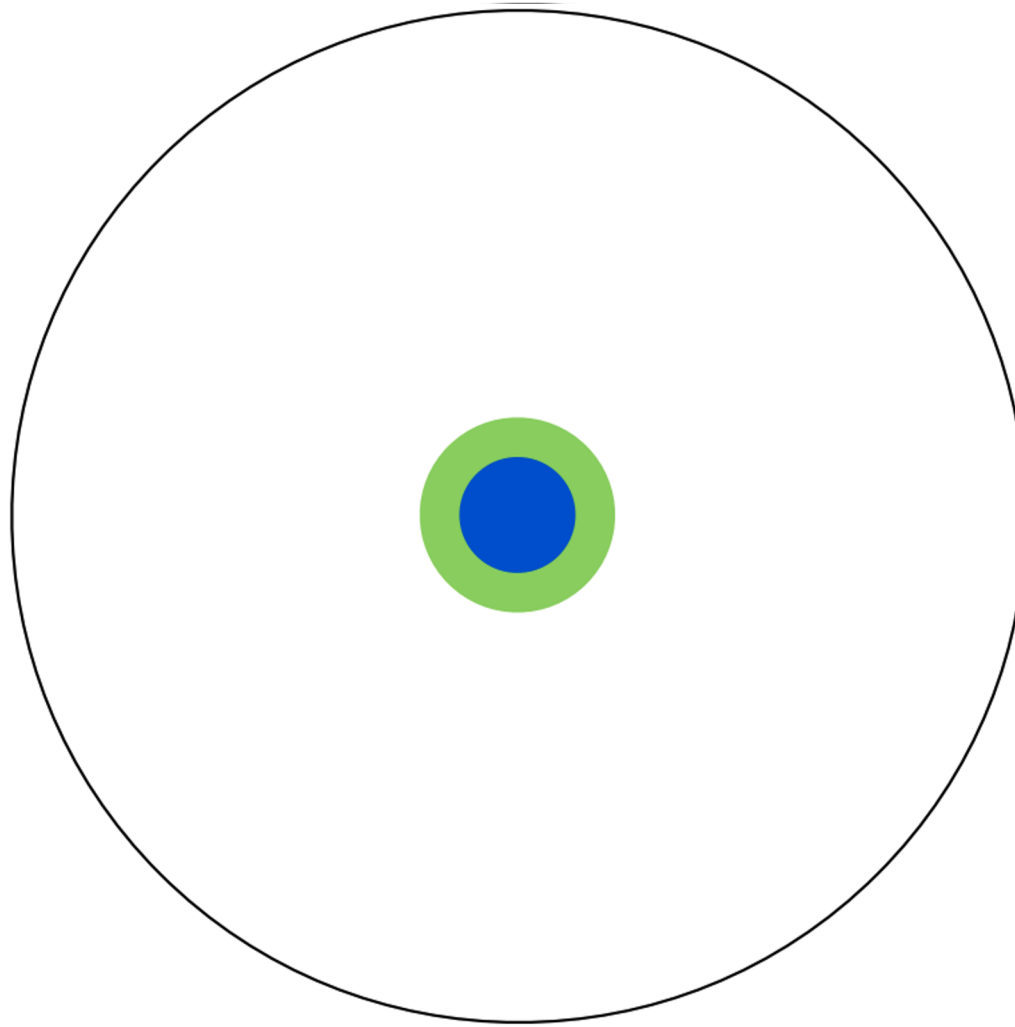
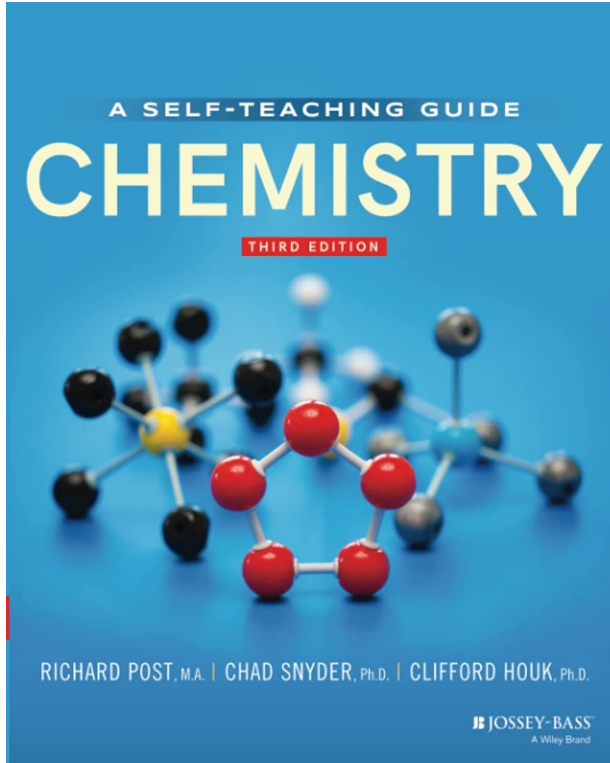
- ❑ Project Goal
- ❑ Project Deliveries and Due
- ❑ Some advices for successful projects
- ❑ Project Types and Topics
- ❑ Past Projects



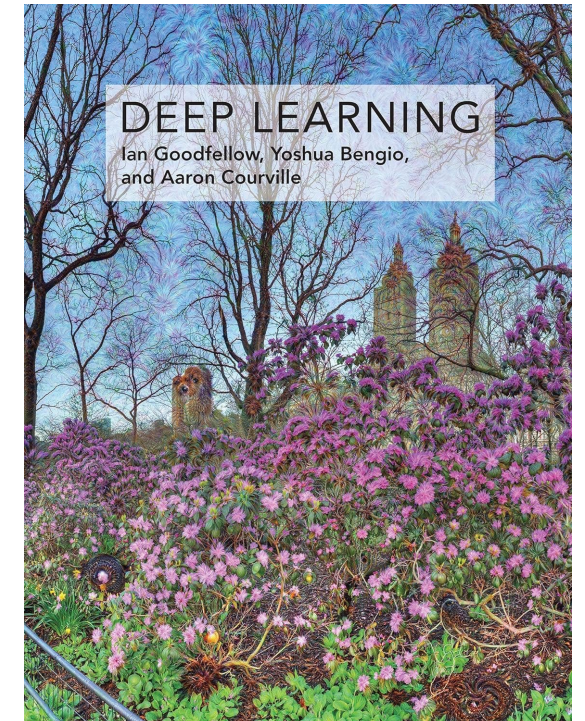
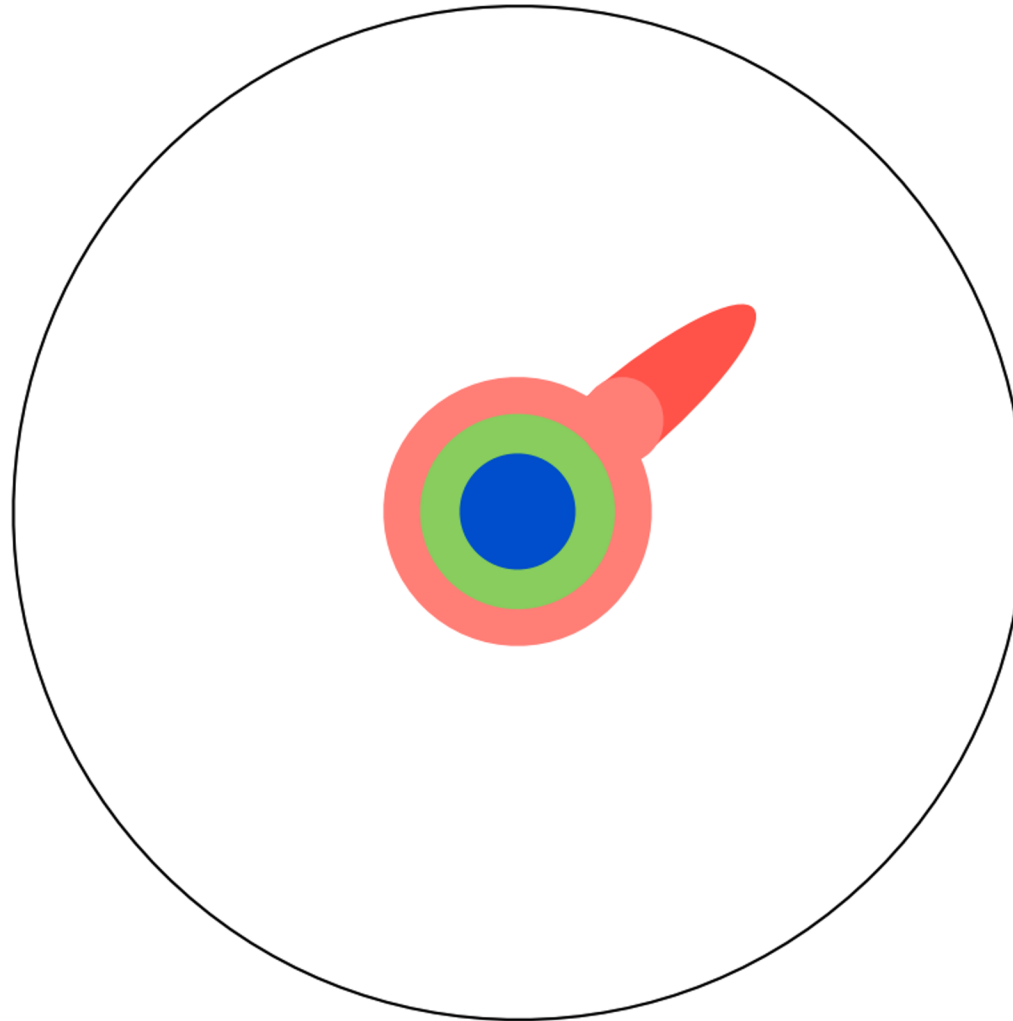
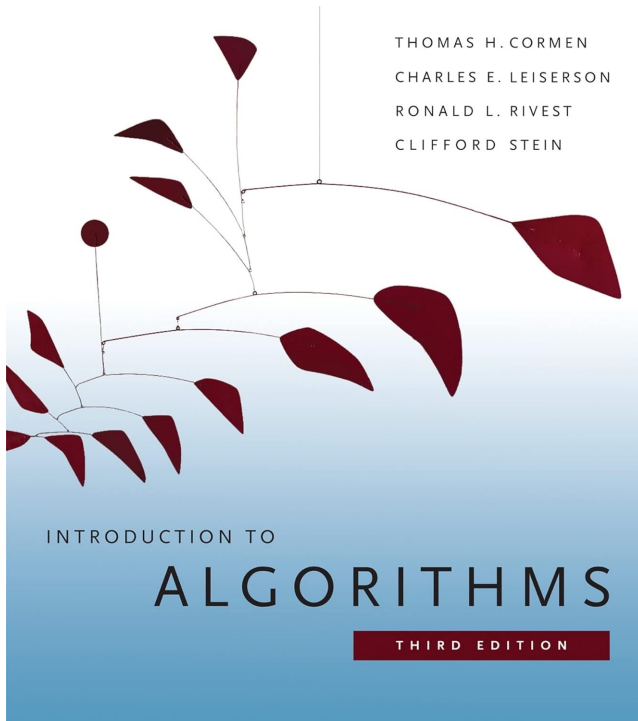
Imagine a circle that contains all of human knowledge:



By the time you finish elementary school, you know a little.
By the time you finish high school, you know a bit more:



With a **bachelor's degree**, you gain a specialty:
A **master's degree** deepens that specialty:



The illustrated guide to a Ph.D. Matt Might

Reading research papers takes you to the edge of human knowledge:
Once you're at the boundary, you focus:

Attention Is All You Need

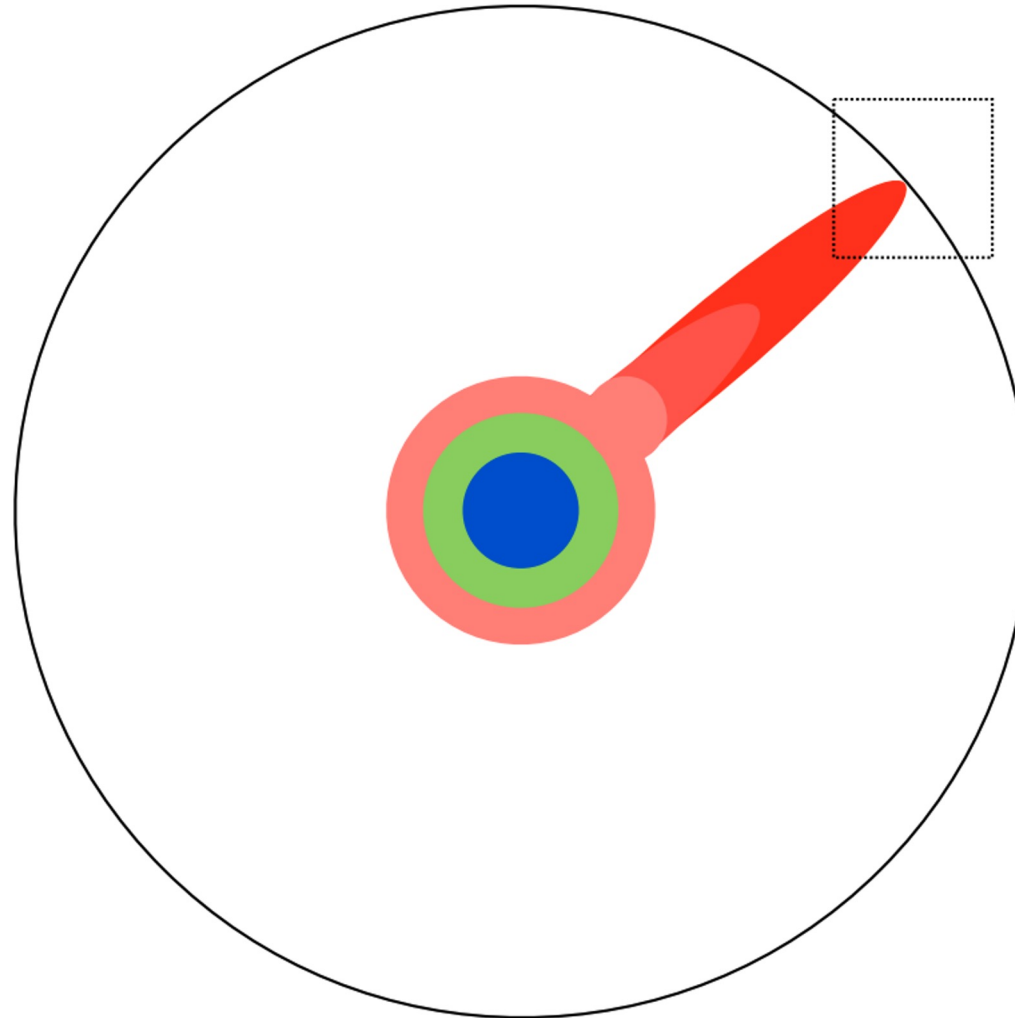
Ashish Vaswani* Google Brain avaswani@google.com	Noam Shazeer* Google Brain noam@google.com	Niki Parmar* Google Research nikip@google.com	Jakob Uszkoreit* Google Research usz@google.com
Llion Jones* Google Research llion@google.com	Aidan N. Gomez*[†] University of Toronto aidan@cs.toronto.edu	Lukasz Kaiser* Google Brain lukaszkaizer@google.com	
Ilya Polosukhin*[‡] ilia.polosukhin@gmail.com			

Abstract

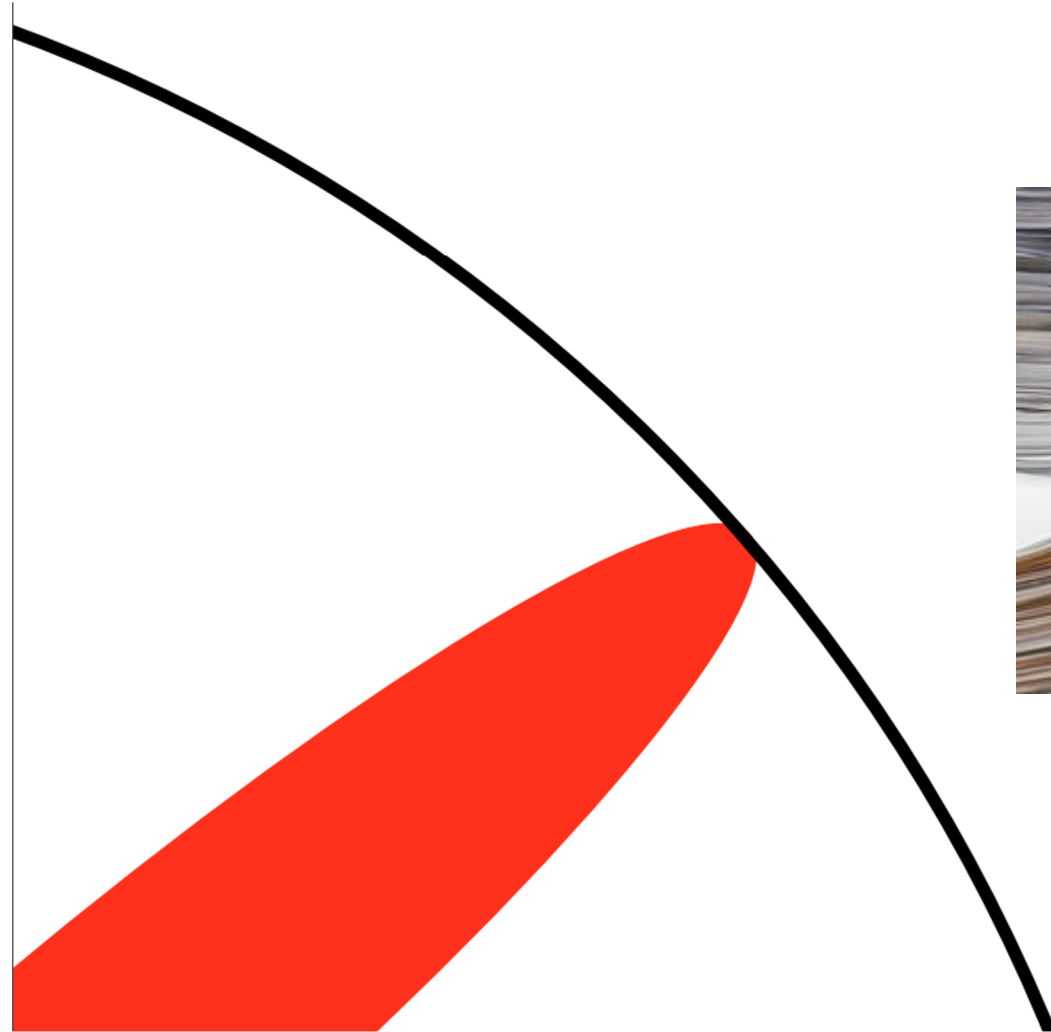
The dominant sequence transduction models are based on complex recurrent or convolutional neural networks that include an encoder and a decoder. The best performing models also connect the encoder and decoder through an attention mechanism. We propose a new simple network architecture, the Transformer, based solely on attention mechanisms, dispensing with recurrence and convolutions entirely. Experiments on two machine translation tasks show these models to be superior in quality while being more parallelizable and requiring significantly less time to train. Our model achieves 28.4 BLEU on the WMT 2014 English-to-German translation task, improving over the existing best results, including ensembles, by over 2 BLEU. On the WMT 2014 English-to-French translation task, our model establishes a new single-model state-of-the-art BLEU score of 41.0 after training for 3.5 days on eight GPUs, a small fraction of the training costs of the best models from the literature.

1 Introduction

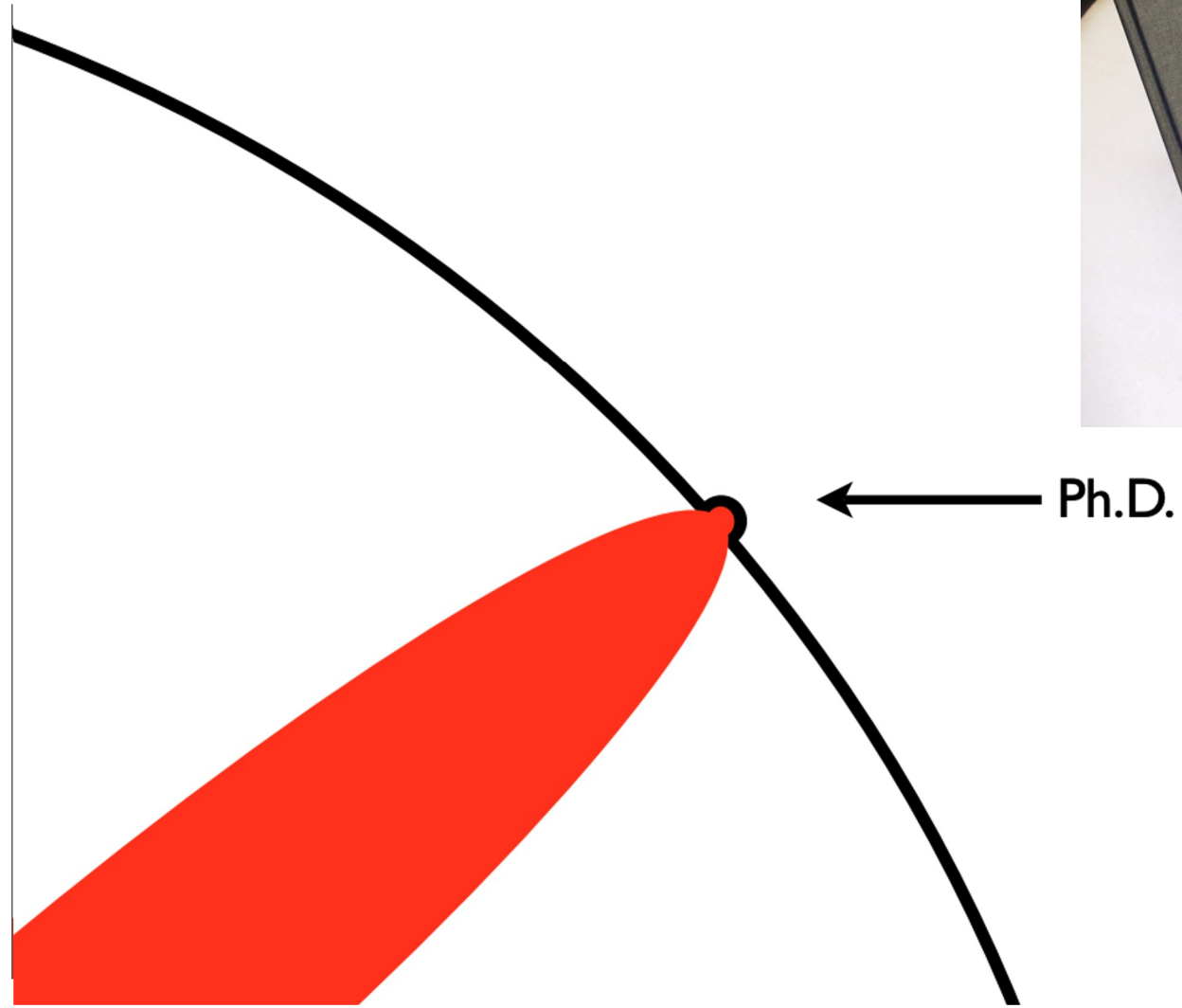
Recurrent neural networks, long short-term memory [12] and gated recurrent [7] neural networks in particular, have been firmly established as state of the art approaches in sequence modeling and transduction problems such as language modeling and machine translation [29, 2, 5]. Numerous efforts have since continued to push the boundaries of recurrent language models and encoder-decoder architectures [31, 21, 13].



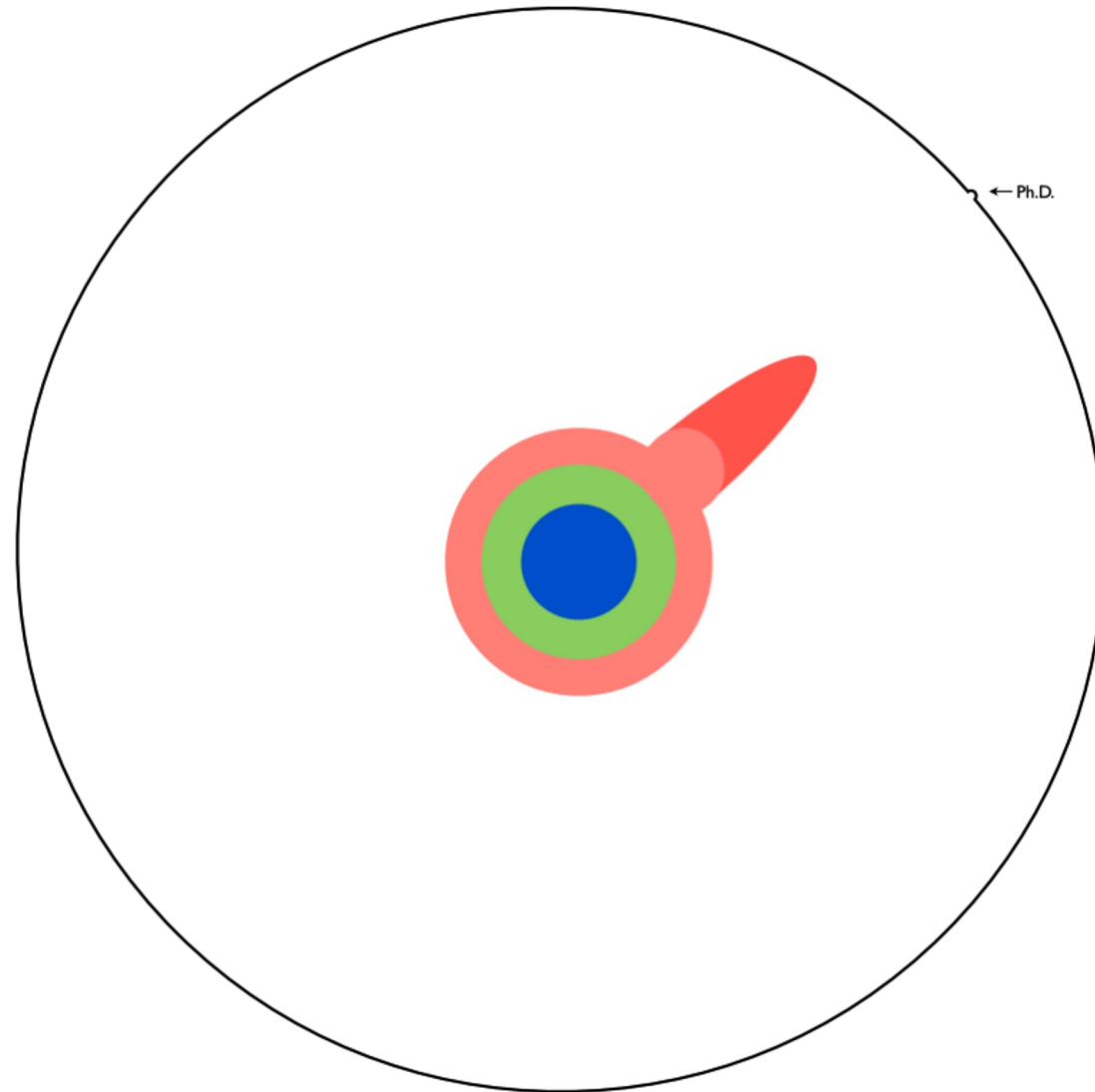
You push at the boundary for a few years:
Until one day, the boundary gives way:

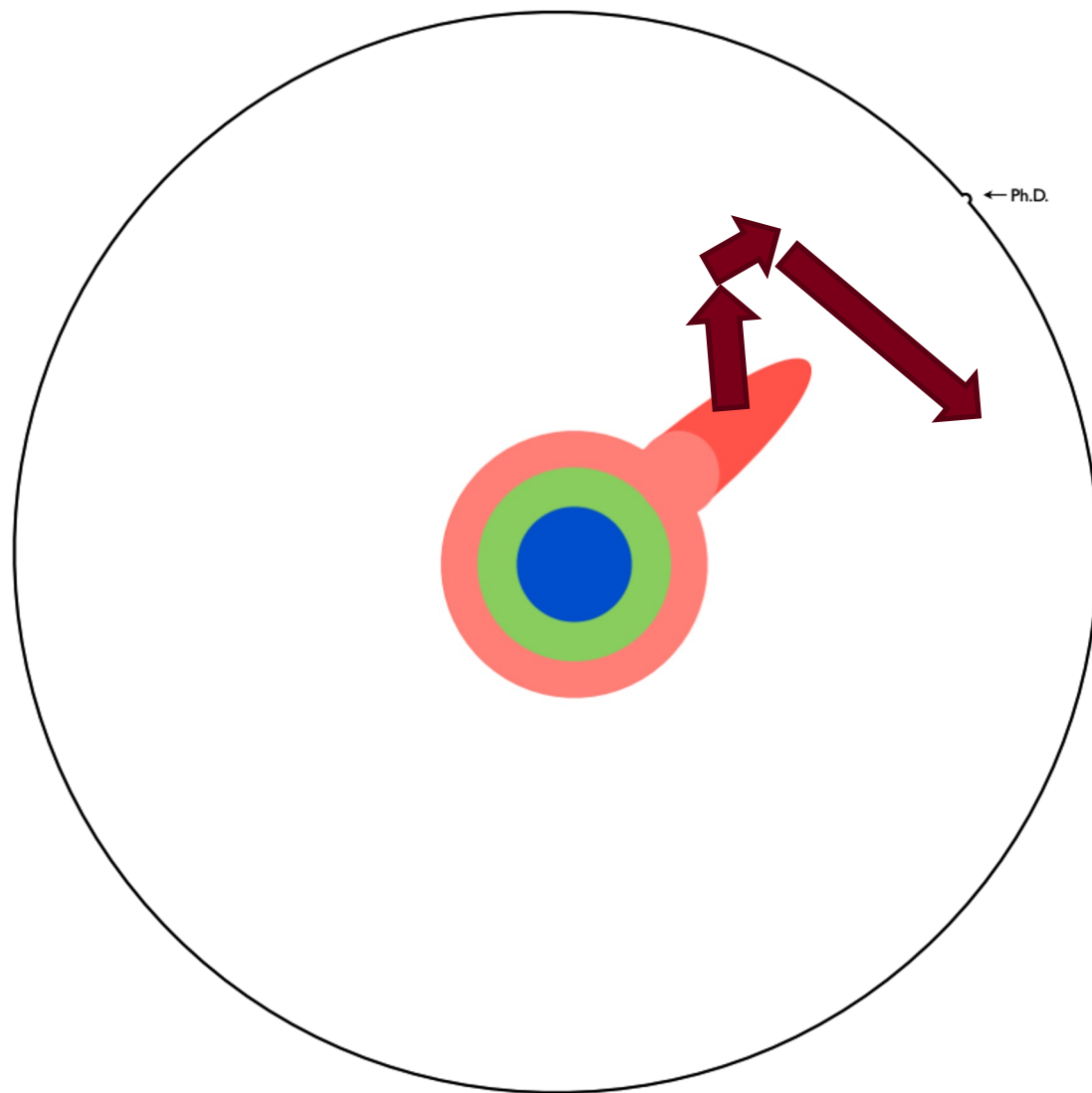


You push at the boundary for a few years:
Until one day, the boundary gives way:
And, that dent you've made is called a **Ph.D.**:

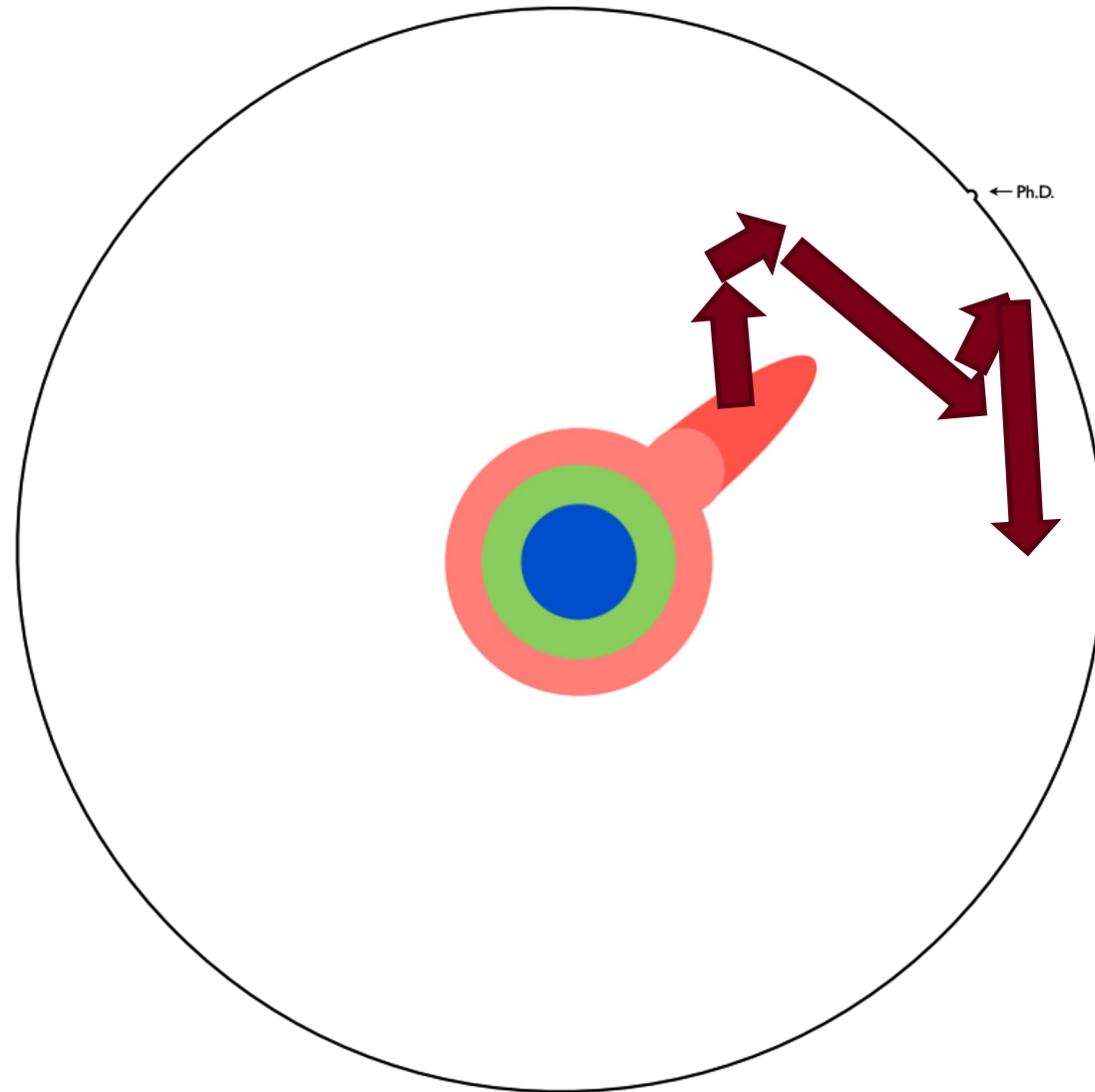


Where you are now!

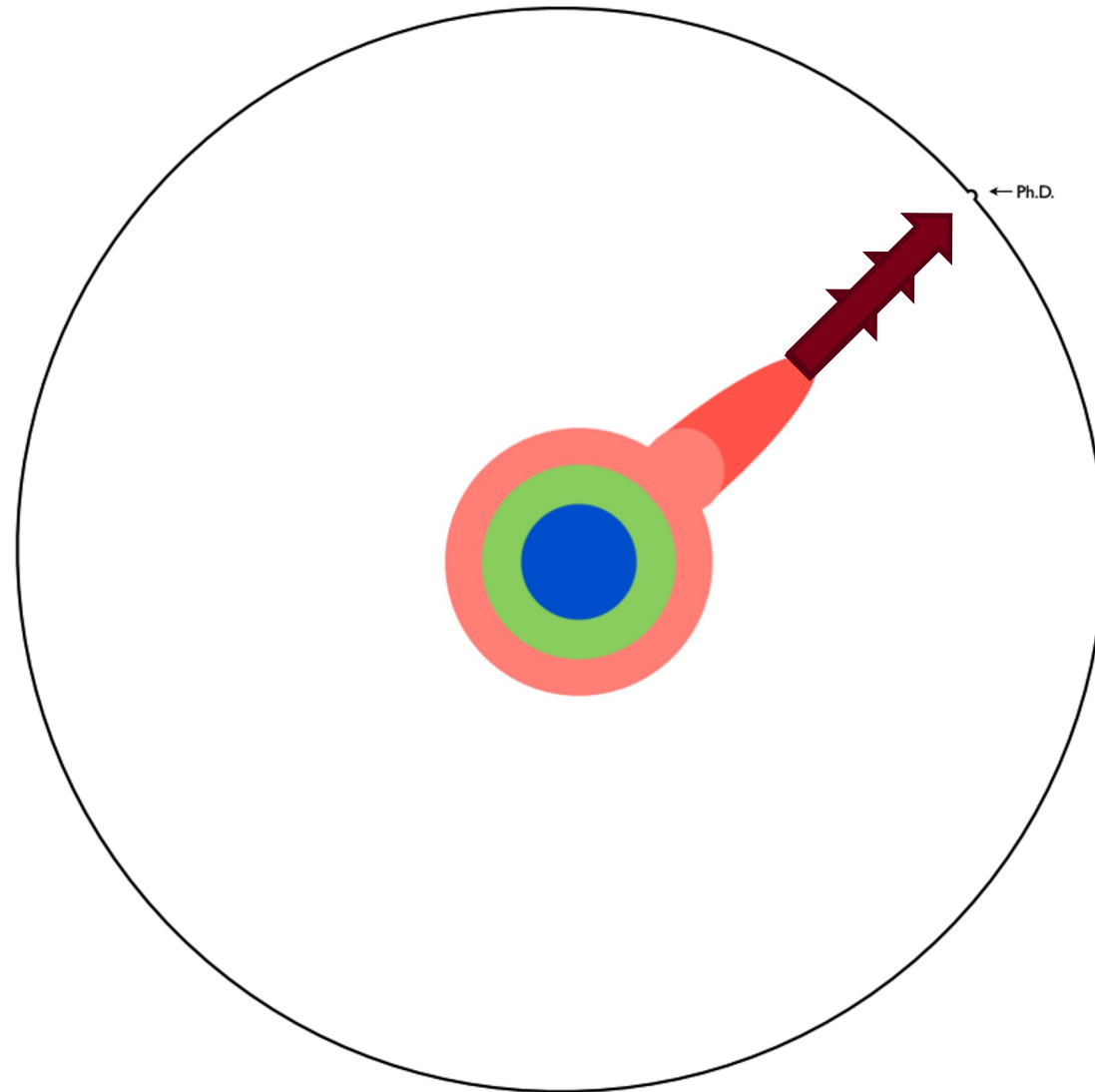




What we can help you on!



Your project goal: experience the NLP research



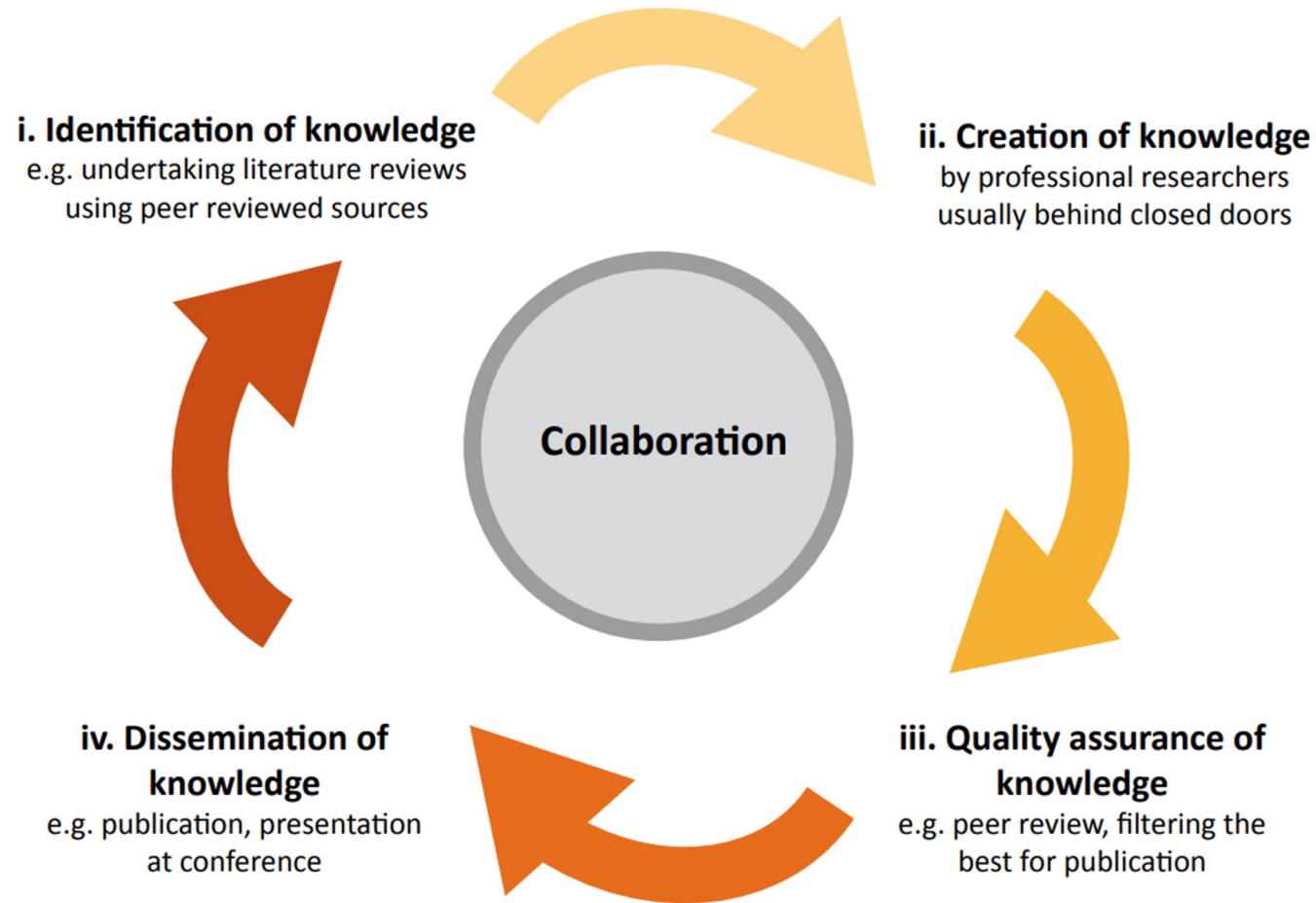
Project Goal (30%)

- ❑ Experience a full pipeline of NLP research
 - Proposal, research, presentation, feedback, etc
- ❑ Good time to interact with other researchers in NLP
 - Your team members, instructors, and mentors
- ❑ You can make your project as an *extension of your homework* but there should be **novel extension** and **research contribution**.



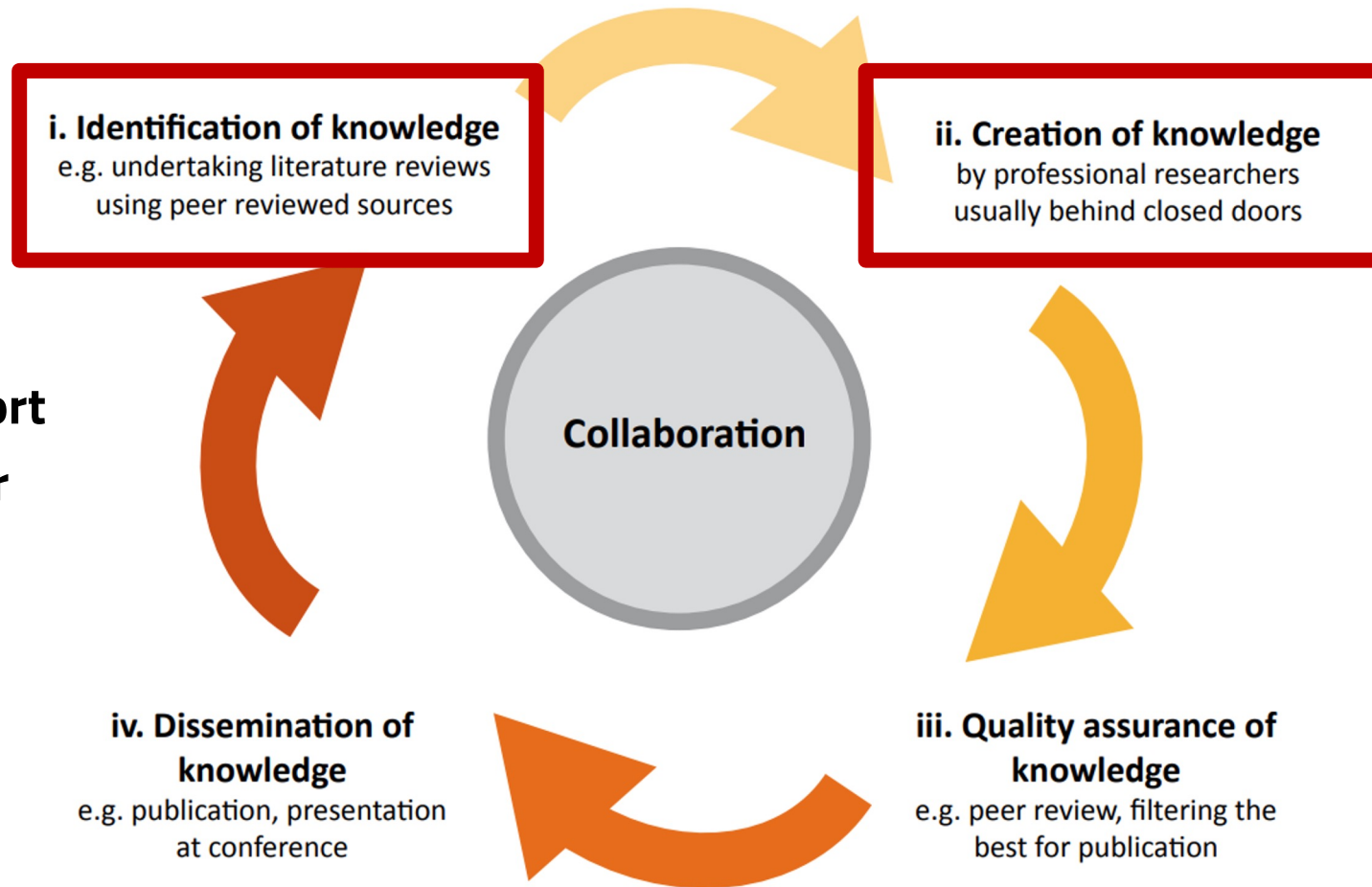
Academic Research Cycle

Figure 1: The academic research cycle



Academic Research Cycle

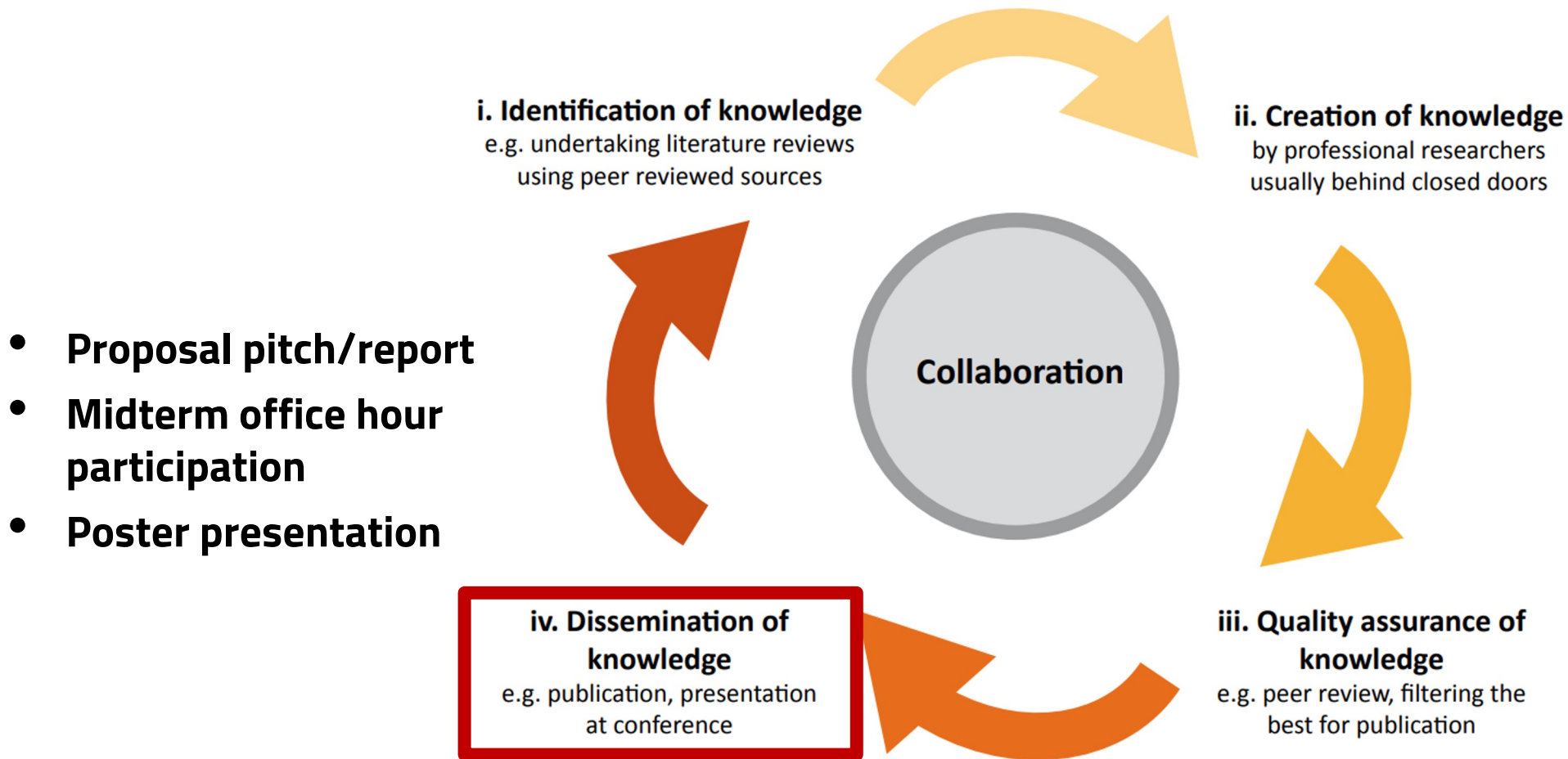
Figure 1: The academic research cycle



- **Proposal pitch/report**
- **Midterm office hour participation**

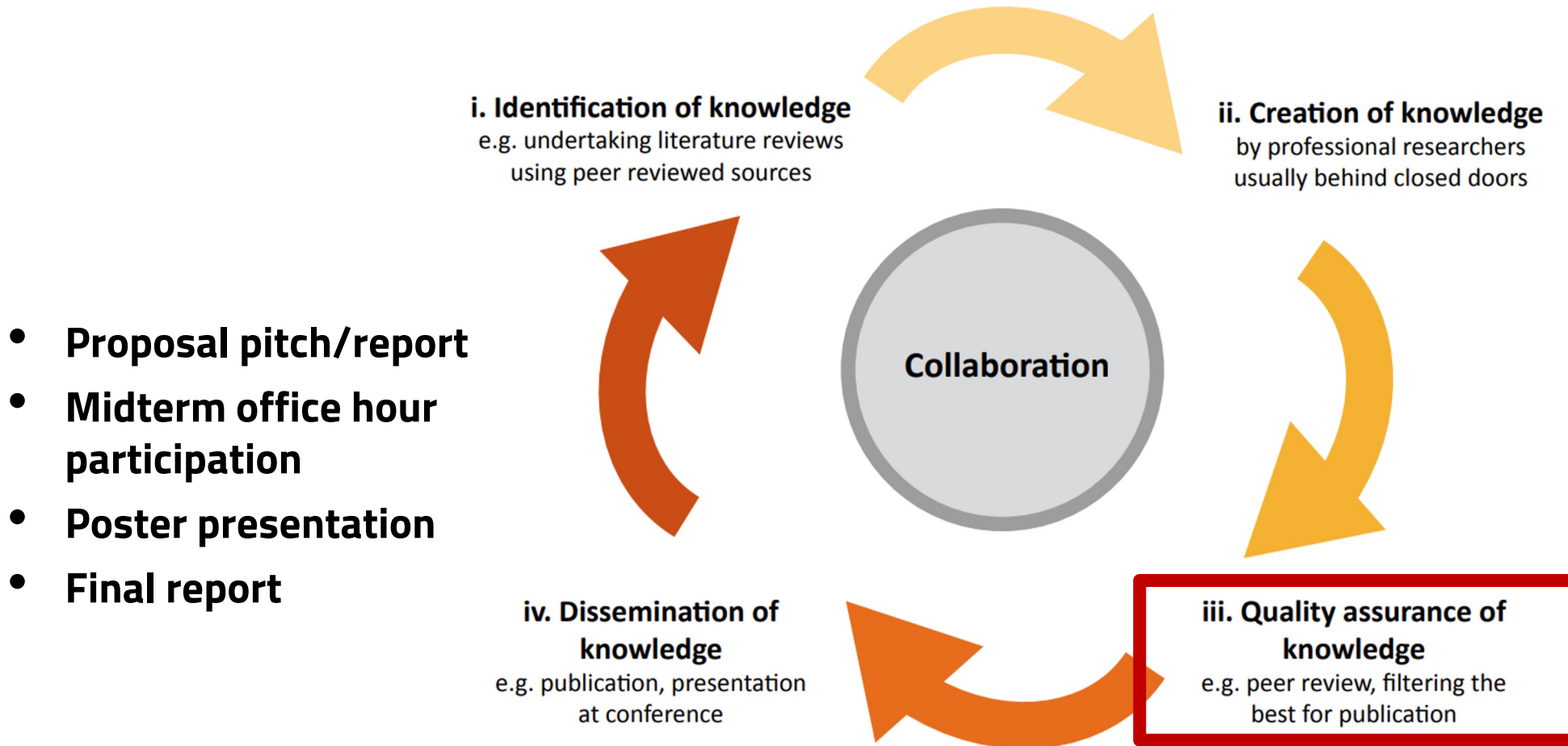
Academic Research Cycle

Figure 1: The academic research cycle



Academic Research Cycle

Figure 1: The academic research cycle



Research Pipeline

- ❑ Motivation and problem formulation
- ❑ Data annotation or understanding of existing dataset
- ❑ Model development and replication of baseline models
- ❑ Experiment and error analysis (be critical and suspicious!)
- ❑ Discussion on limitations and ethical consideration
- ❑ Conclusion and future work



Project Deliveries and Due

- ❑ Team formation and brainstorming (2 points, due: **Feb 16**)
- ❑ Proposal pitch (3 points, due: **Mar 12/14**)
- ❑ Proposal report (5 points, due: **Mar 19**)
- ❑ Midterm office hour participation (5 points, due: **Apr 5**)
- ❑ Poster presentation (5 points, due: **Apr 23/25**)
- ❑ Final report (10 points, due: **May 3**)

Feb 15	Project Guideline  Team formation due
Mar 12	Project Proposal Pitch (1) 
Mar 14	Project Proposal Pitch (2) 
Apr 23	Final Project Poster (1) Project poster due
Apr 25	Final Project Poster (2) Project final report due (May 3, Friday)



Team Formation and Brainstorming (2 points)

- Submit your team information and a list of project ideas and titles (i.e., a few sentences) to Canvas.
- You will be assigned a project mentor with feedback within one week of submitting your ideas

Evaluation. The following items should be included in your submission:

Rubrik (2 points) for Proposal Report:
(1 point) Team name and members
(1 point) Potential project titles and ideas



Proposal Pitch (3 points)

Project Title Name 1, Name 2, ...		Team Name / Mentor
Problem Definition Just an example	Plan Forward / Preliminary Results if Any Just an example. Feel free to add pictures etc!	
Data/Methods/etc. Just an example	Some questions for your audience Just an example	

- ❑ Before submitting the proposal, your team needs to give a 3-minutes presentation of your proposal idea
 - Every member of your team should present in person or virtually for UNITE/remote students
- ❑ You need to follow the example template and create a slide for your own project in the slide deck, including the following:
 - What problem you are solving, what datasets/models you intend to use, what next steps to take, and questions about your project
- ❑ Your proposal should clearly address the comments and feedback

Evaluation. The following items should be included in your submission:

Rubrik (3 points) for Proposal Report:
(1 point) Clear formulation and definition of your problem
(1 point) Specific execution plan (e.g., datasets, models, systems)
(1 point) Preliminary results if possible and questions for audience



Proposal Report (5 points)

- Maximum 3 pages report excluding references
- Upload your PDF report to Canvas using the class [LaTeX](#) template
- Feedback on your proposal will be ready within two weeks after your submission

Evaluation. The following items should be included in your proposal:

Rubrik (5 points) for Proposal Report:

(0.5 point) Title, Team name, members, and role assignment

(1 point) ``Clear'' Motivation and Problem definition

(1 point) ``In-depth'' Literature survey (at least three relevant and latest
→ papers)

(2 point) ``Novel'' proposed idea and your execution plan

(0.5 point) Plan to address feedback from the pitch presentation



Midterm office hour participation (5 points)

- ❑ Schedule an office hour meeting with your assigned mentor (15 to 20 minutes) and discuss your intermediate results and progress
- ❑ The mentor expects you to give an update on your progress, ask questions, and consult with your plan until the final presentation.
- ❑ After the meeting, you should summarize what intermediate progress you made and what feedback and discussion you had with your mentor and submit it to Canvas.

Evaluation. Below is a rubric for midterm evaluation:

```
Rubrik (5 points) for Midterm Office Hour Participation:  
(2 points) Additional development of your ideas after the proposal  
(2 points) Preliminary results and comparison to the baseline performance  
→ (e.g., experimental results, findings, visualization)  
(1 point) How to address the mentor's feedback and plan until the end of the  
→ semester
```



Poster presentation (5 points)

- ❑ Everyone on your team should present their work at your assigned poster session.
- ❑ Upload your poster PDF to Canvas before your presentation
- ❑ Evaluation:
 - Instructors will use the same rubric used in the final report except for the completeness of your work.
 - Every peer group is assigned a random team on their session day to review based on a rubric provided by instructors. Based on that, the team winning best poster will be given extra credit.

Your poster clearly describes the following information:

```
Motivation
Literature survey
Problem definition
Proposed ideas
Contribution
Experimental results and comparison with baselines
Main findings
Limitation and discussion
Plan for the final report.
```



Poster Sessions

- ❑ Print your “32x40” poster
- ❑ Location: [Shepherd 164](#) (aka Drone Lab)
- ❑ Time: Apr 24 (Group A), Apr 26 (Group B)

- ❑ Printing instructions are provided at this [link](#); you can request it using the form (details on how to fill out initial fields on next slide).
 - Keep in mind, they guarantee posters submitted 2 **business** days in advance, but **do not** work on the weekends.



CSE- Poster Printing Request Form

Request Details

Select your department *

Choose a printer * 

Pick a printer that is large enough for your poster and prints on the material you want. One dimension of your poster must be less than or equal to the number indicated in the option.

Poster dimensions in inches * 

Provide the size of the poster in inches. Examples: 72" x 42", 42" x 48", 20" x 36"

Advisor Approval * 

The advisor approving this request. If you are the advisor, you can select your own information here.



Final report (10 points)

□ Upload your PDF report and code on Canvas

- Maximum 8 pages with unlimited reference and appendix
- Zipped code or link to your github

□ Rubric for the final evaluation

- <https://dykang.github.io/classes/csci5541/S24/rubrick.html>
- 100 points will be normalized to 10 points in grading
- This is a relative evaluation

Rubrik (100 points) for Final Report

Below are three general evaluation criteria:

(10 points) Novelty: Compared to the state-of-the-art

- methods/systems/datasets, how novel is your approach? Is your work publishable?

(10 points) Significance: How strong is your result? Is your finding still

- holding if different setups or prompting tricks?

(10 points) Clarity: How clear and easy-to-follow is your report? Do you have

- well organized presentation of your results and problem definition?

Introduction / Background / Motivation:

Introduction / Background / Motivation:

(5 points) What problem do you try to solve? Describe your objectives clearly

- without using any technical jargon.

(5 points) How is it done today by other researchers? What are the limitations

- and challenges of current practice?

(5 points) Who might be interested in your work? What kinds of impact can you

- make?

Approach:

(5 points) What did you do exactly? How did you solve the problem? Why did you

- think it would be successful? What is your hypothesis?

(5 points) What challenges did you anticipate and/or encounter during the

- development of your approach? Did the very first thing you tried work?

(5 points) What is scientific novel of your approach to address the

- challenges?

Experiments / Results / Error Analysis:

Experiments / Results / Error Analysis:

(5 points) How did you measure success? What research questions do you want to

- validate? What evaluation metrics and experiments were used? What were the

- results, both quantitative and qualitative? Did you succeed? Did you fail?

(5 points) No matter you succeed or fail, why? Which data points are

- incorrectly predicted by yours but previous models can't, or vice versa.

(5 points) Are there still some failure cases? Why can't your approach address

- them? Any potential solutions?

(5 points) Are the ideas/problem/results presented with appropriate

- illustration?

Additional points:

Discussion points:

(5 points) Replicability: How easily are your results able to be reproduced by

- others?

(5 points) Datasets: Did your dataset or annotation affect other people's

- choice of research or development projects to undertake?

(5 points) Ethics: Does your work have potential harm or risk to our society?

- What kinds? If so, how can you address them?

(5 points) Discussion: What limitations does your model have? How can you

- extend your work for future research?



Some pics from past
poster sessions



Natural Language Processing Class Poster Presentations

Poster flyers, 5541 S23

Monday, April 24 | Wednesday, April 26

4:00pm to 5:15pm, Shepherd 164 (Drone Lab)



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Natural Language Processing Poster Presentations

SESSION A

Group 1

Improving Temporal Commonsense Understanding in Language Models

ELMosts

Challenging Human Annotators: A Study on GPT-4's Capability as an Annotator Replacement

Word Wizards

Sarcasm Analysis in Emoji Prediction

CompE Kids

PIRATE Papers: Plagiarism Identification and Reference Analysis Tool for Evaluating Papers

SESSION B

Pay Attention

Comparing Text Summarization Language Models Across Data Domains

RGB Color Coders

Token-Level Data Augmentation Methods for Machine Translation with an LSTM Model on the ParaMed English-Chinese Corpus

Text-Mining Titans

NBME - Score Clinical Patient Notes

Group 6

(tentative) Readability Measurement using chatGPT

Linguistic Lords

A Critical Analysis of The Differences in Irony Detection Between ChatGPT and Traditional Language Models

NLPer

Who is speaking? Discriminating Artificial and Human-Generated Text with A Natural Language Processing Approach

Group 20

Towards Accessible Multimodal AI: Developing an Affordable and Inclusive Model

The Fifth Paradigm

Exploring Hallucination in LLMs: A Study of ChatGPT and GPT-3 to Enhance Fact-Based Results

Self-supervised Learners

Stock Performance Forecasting Using Shareholder Meeting Transcripts

Unnamed Entities

Getting in Tune - Exploring the effects of Instruction Tuning on performance for Large Language Models

Syntaxidermists

AI Generated Text Detection

NLProdigies

Advancing Visual Analysis: Using Language Models in Common-Sense Reasoning Tasks

Iron Code Benders

Task Generalization using the SUP-NATINST dataset

Semantic Savants

Kidz Bopification

StarkInc

VlanGogh: Vision & Language-guided Generalized Object Grasping

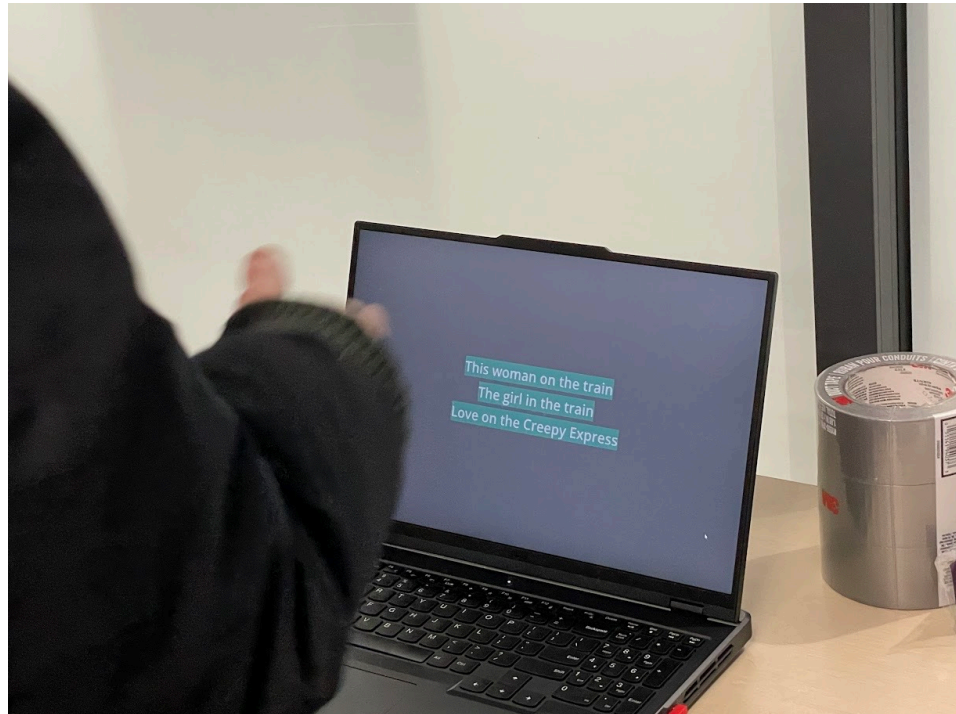
Monday, April 24 | Wednesday, April 26

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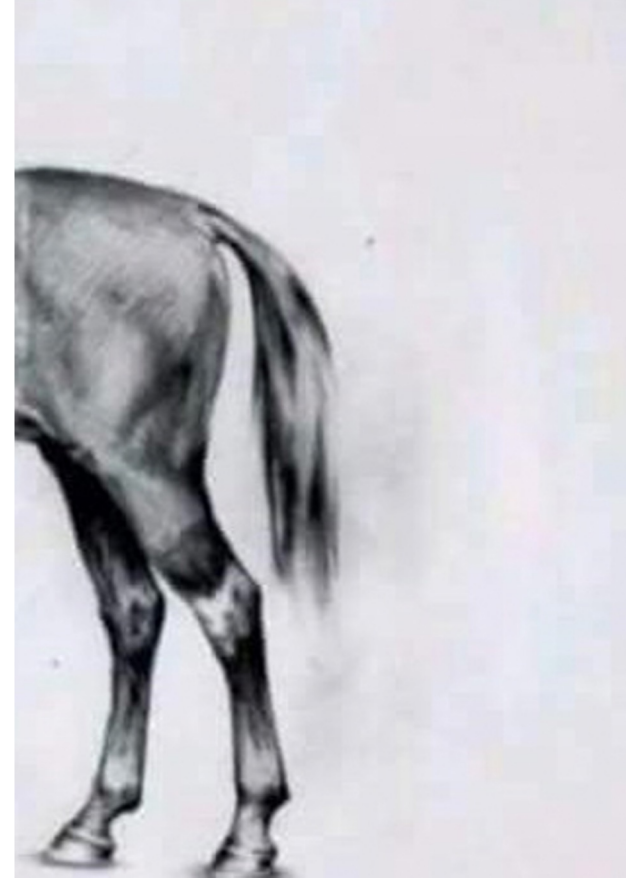




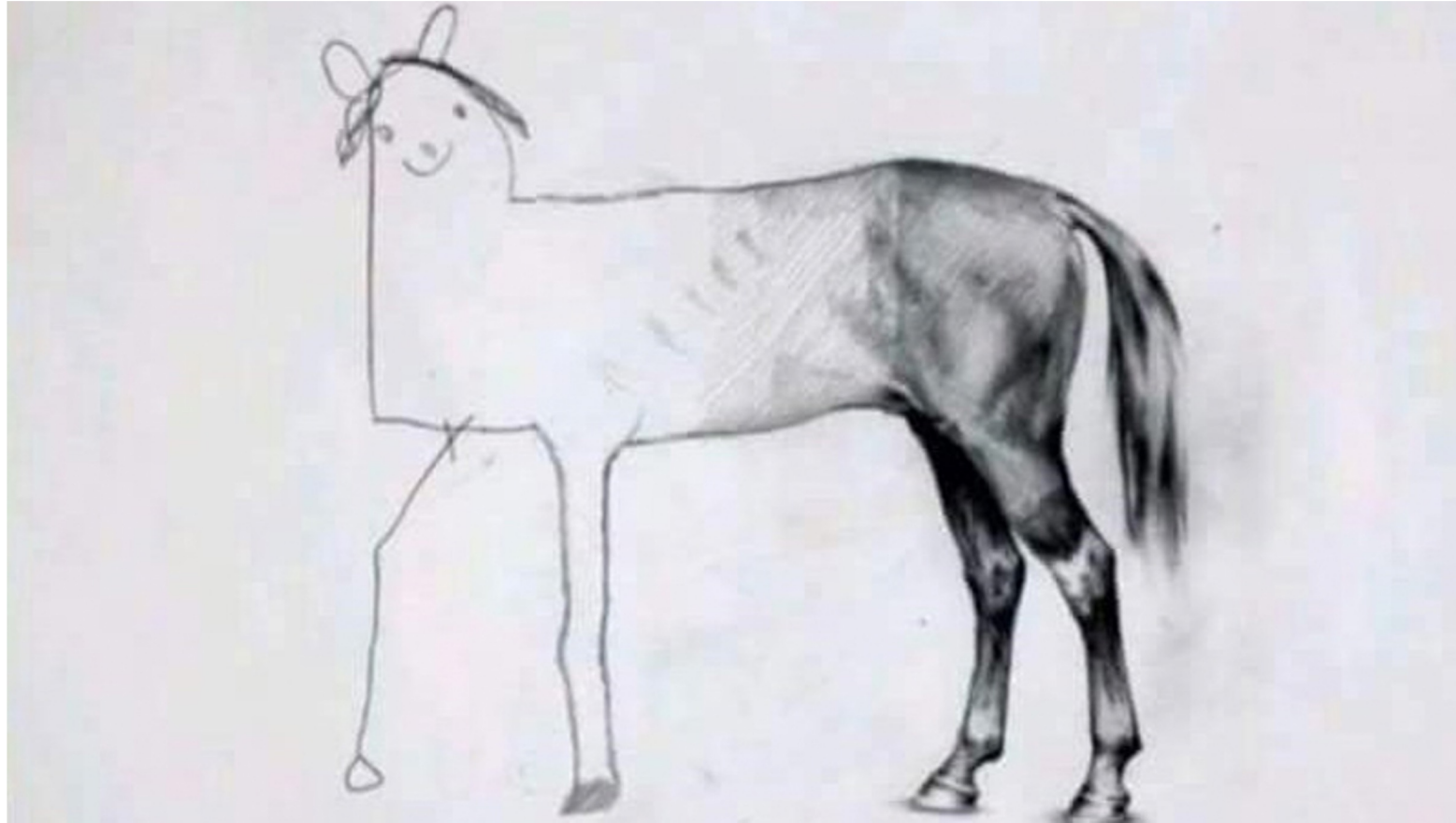
Some advices for successful projects



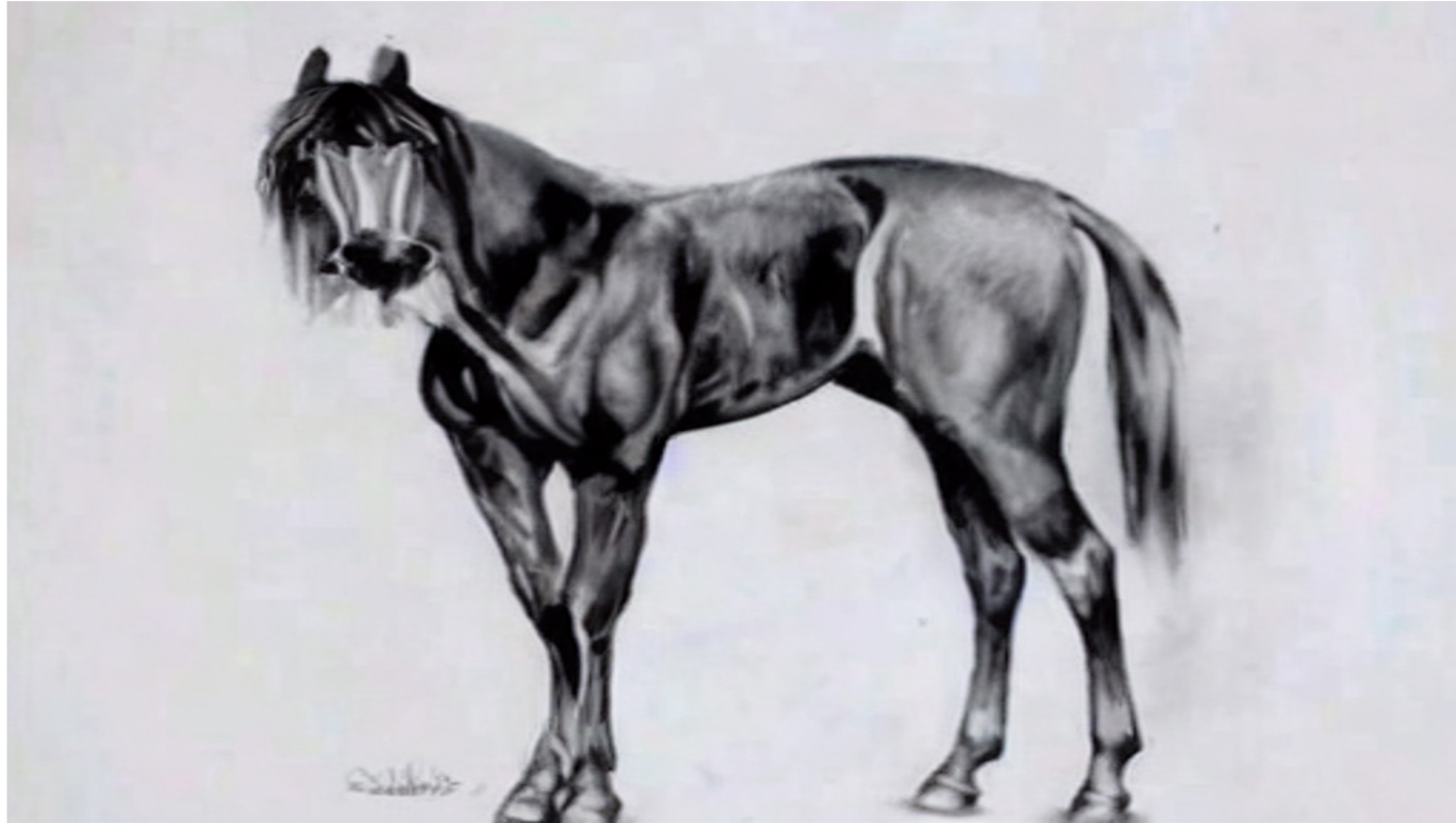
Don't be ambitious



Don't be ambitious



Of course, AI can do better than us!



<https://huggingface.co/spaces/multimodalart/stable-diffusion-inpainting>

Of course, AI can do better than us!

🧩 Stable Diffusion Multi Inpainting

Inpaint Stable Diffusion by either drawing a mask or typing what to replace

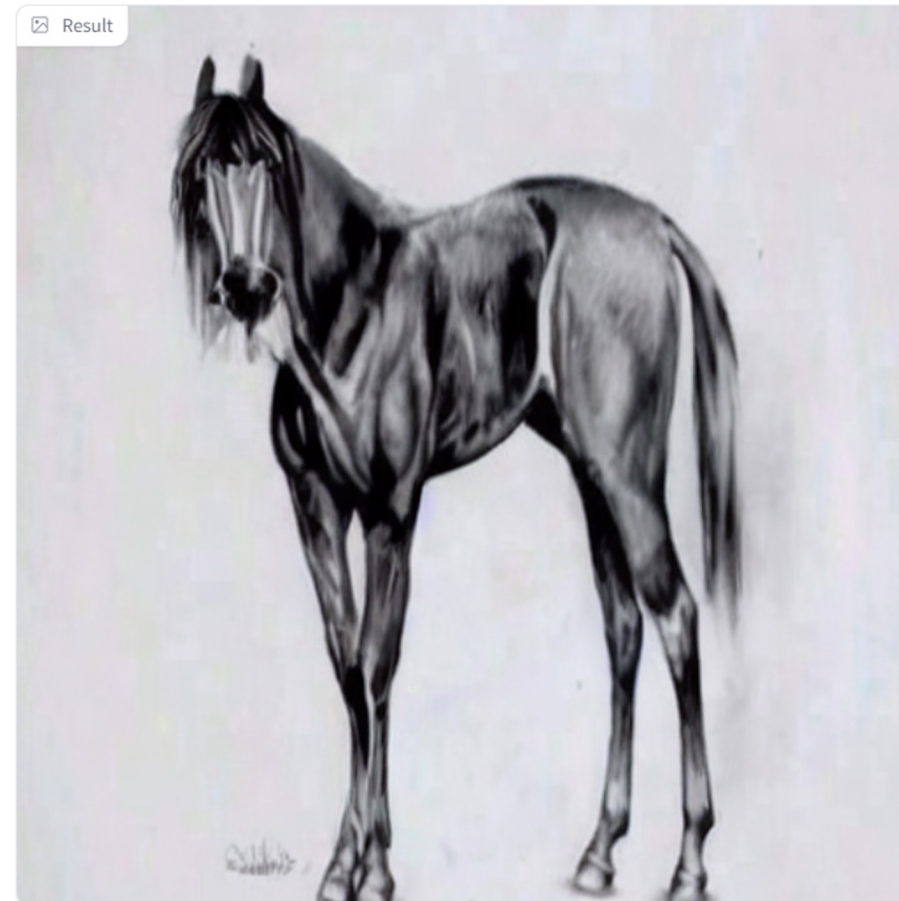


draw a mask above

type what to mask below

What to find in your image

Disabled



Start RIGHT NOW!

to start right now!



Literature survey

- ❑ Do a thorough literature search
 - Google Scholar, ACL anthology (<https://aclanthology.org/>), arXiv (<https://arxiv.org/archive/cs>), OpenReview (<https://openreview.net/>), etc
 - If you find a similar/relevant paper, check out the other papers that recently cited it.
- ❑ Check out papers-with-code, github, project pages, etc
 - Re-use existing code on github or authors' sites.
 - Check out latest benchmark results in PapersWithCode leaderboard
- ❑ Tips for reading papers:
 - Do not read from the beginning to the end in order
 - Tables and figures with captions provide useful information at first glance.

ABSTRACT

Researchers spend a great deal of time reading research papers. However, this skill is rarely taught, leading to much wasted effort. This article outlines a practical and efficient *three-pass method* for reading research papers. I also describe how to use this method to do a literature survey.

Categories and Subject Descriptors: A.1 [Introductory and Survey]

General Terms: Documentation.

Keywords: Paper, Reading, Hints.

1. INTRODUCTION

4. Glance over the references, mentally ticking off the ones you've already read

At the end of the first pass, you should be able to answer the *five Cs*:

1. *Category:* What type of paper is this? A measurement paper? An analysis of an existing system? A description of a research prototype?

2. *Context:* Which other papers is it related to? Which theoretical bases were used to analyze the problem?

3. *Correctness:* Do the assumptions appear to be valid?

❑ **Make a clear distinction of how your approach is different from prior work**



Model Development

- ❑ Replicate and evaluate your **baseline** first
 - The following two baselines **MUST be included in your report**, if your paper's contribution is to propose a better model
 - Existing fine-tuned models or pre-trained models
 - [ChatGPT](#), [GPT4](#), and other LLMs
- ❑ Use Git(Hub) to version control your project
- ❑ Check out Huggingface's [data](#) and [model](#) cards
- ❑ Use [Wandb](#) and [tensorboard](#) for tracking your training
- ❑ Demonstrate your algorithm/model using [Gradio](#) or [Streamlit](#)





AK

@_akhaliq

pip install

transformers

diffusers

timm

datasets

safetensors

accelerate

optimum

wandb

tokenizers

evaluate

simulate

gradio

is all you need



Computing Resources

- ❑ Your own/group/advisor's resources including MSI
- ❑ Google Cloud/Amazon AWS credits/Google Colab (1 free GPU)
- ❑ Request and get access to the above ASAP if you plan on using them!



The DOs (for successful projects)

- ❑ Clearly **divide** work between members
- ❑ Start **EARLY** and work **REGULARY** every week rather than rush at the end
- ❑ Set up **workflow** – download data, verify data, set up base code on github, communicate via Slack, sharing results on Google spreadsheet, etc
- ❑ Have a clear, well-defined **hypothesis** to be tested
- ❑ Conclusions and results should provide some **insights and takeaways**
- ❑ **Meaningful** tables and plots to **display** the key results
 - ++ nice visualizations or interactive demos
 - ++ novel/impressive engineering feat
 - ++ good empirical results in both qualitative and quantitative ways.



The Don'ts

- ❑ Data **not available** or hard to get access to, which stalls progress
- ❑ All experiments run with prepackaged source – **no extra code written** for model/data processing
- ❑ Team starts **LATE** – only draft of code up before dues
- ❑ Just ran model once or twice on the data and reported results (not much hyper-parameter **tuning** and statistical **significance test**)
- ❑ A few standard graphs (loss curves, accuracy) **without any analysis**
- ❑ Results/Conclusion don't say much besides that it didn't work
 - Negative results are fine, but only with in-depth analysis and **justification**



Project Types and Topics

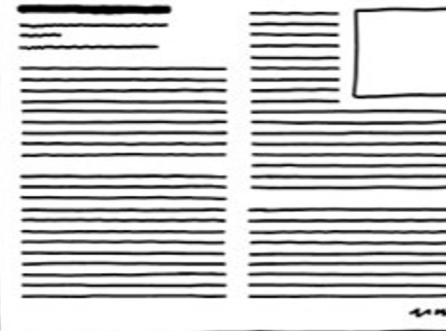


TYPES OF ML / NLP PAPERS

HERE'S A NEW TASK
WHERE OUR MODELS
DON'T SUCCEED JUST
YET



NEVER MIND. TURNS
OUT WITH SOME
CLEVER TRICKS, WE
ALREADY GET SUPER-
HUMAN PERFORMANCE

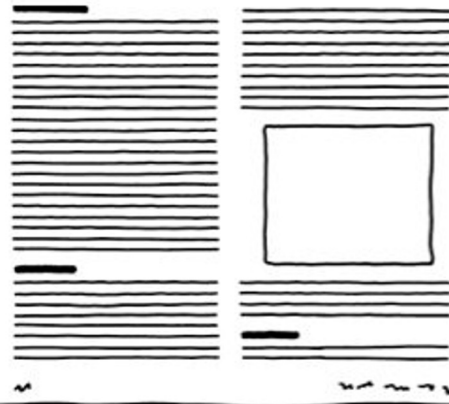


WE COMBINED TWO
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UNSURPRISING WAY

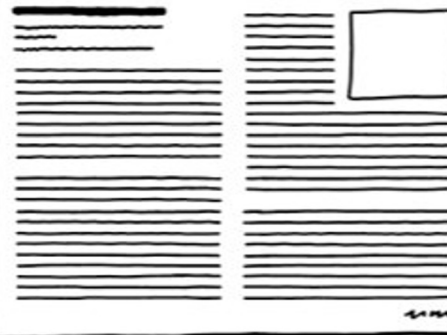


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WE COMBINED TWO
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TECHNIQUES IN AN
UNSURPRISING WAY



TRANSFORMERS ALSO
WORK ON THIS TYPE
OF DATA



A TASK-SPECIFIC
IMPROVEMENT THAT
MAY OR MAY NOT
WORK ON YOUR DATA



THIS SIMPLE TRICK IS
ALL YOU NEED



<https://twitter.com/sebruder/status/1387886948438708224>



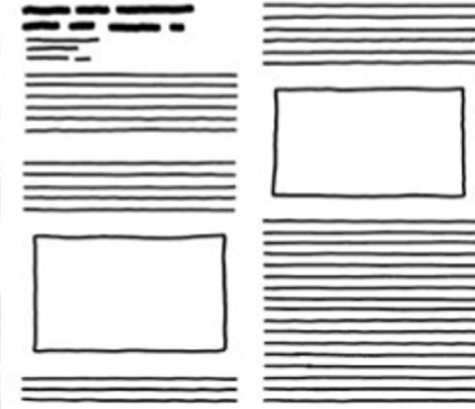
NEURAL NETWORKS
ARE LIKE THE BRAIN
IN THIS SPECIFIC WAY,
WHICH SLIGHTLY
HELPS FOR OUR TASK



GOOD LUCK RUNNING
A STATISTICAL
SIGNIFICANCE TEST
ON OUR RESULTS



CHECK OUT THESE NICE
CHERRY-PICKED
SAMPLES OF OUR MODEL



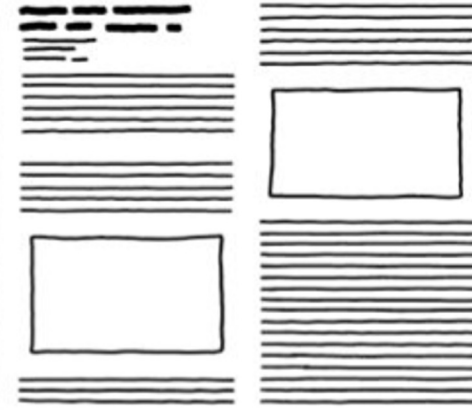
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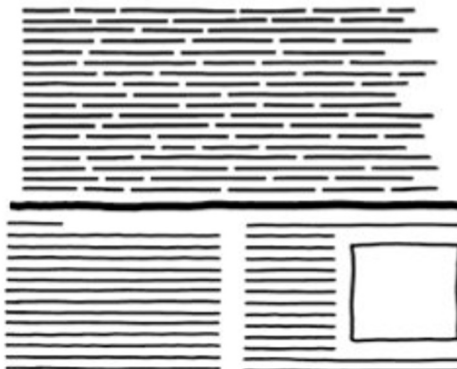
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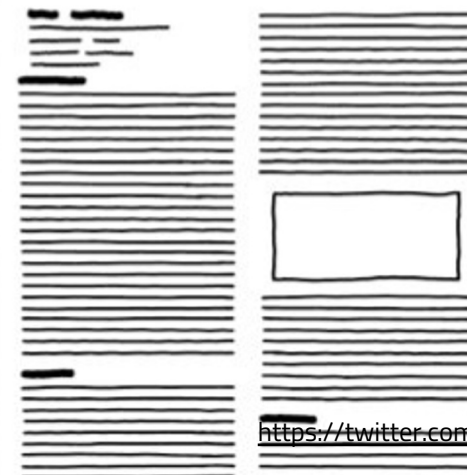
WE USED LOTS OF
COMPUTE TO TRAIN A
SLIGHTLY BETTER
LANGUAGE MODEL



SOME THOUGHTS ON
WHY THE WAY WE DO
THINGS IS WRONG



DID YOU KNOW THAT
OUR MODELS FAIL ON X?



https://twitter.com/scb_ruder/status/1387886948438708224



Different types of contributions

The following are possible types of contributions you could make along with example papers:

- Critical analysis of existing model/dataset, e.g., [NRS⁺18, KL18, RKR20]
- New benchmark results and findings judged suitable for acceptance to an NLP or ML workshop,
- Collection of your own dataset on new tasks, (complex social) problems [EZM⁺21] or adversarial datasets [PWGK21] that can fool the existing systems,
- An in-depth literature survey on emerging topics [FGW⁺21, ZKK23],
- Interactive demonstration (e.g., Chrome Extension, Flask) [DKR⁺22, KMWK23] or visualization of existing systems [WTW⁺19],
- Applying NLP tools to your own domain of research (e.g., psychology [Kos23, Ull23], law [CHMS23], education, robotics [ABB⁺22]),
- New open-source repository or dataset with a high impact on the community
- Others (consult your mentors as soon as possible if you wish to do other types of projects).

https://dykang.github.io/classes/csci5541/S24/hw/CSCI_5541_S24_Project_Description.pdf



Trendy Topics in COLM CFP

<https://colmweb.org/cfp.html>

- ❑ All about **alignment**: fine-tuning, instruction-tuning, reinforcement learning (with human feedback), prompt tuning, and in-context alignment
- ❑ All about **data**: pre-training data, alignment data, and synthetic data --- via manual or algorithmic analysis, curation, and generation
- ❑ All about **evaluation**: benchmarks, simulation environments, scalable oversight, evaluation protocols and metrics, human and/or machine evaluation
- ❑ All about **societal implications**: bias, equity, misuse, jobs, climate change, and beyond
- ❑ All about **safety**: security, privacy, misinformation, adversarial attacks and defenses
- ❑ **Science of LMs**: scaling laws, fundamental limitations, emergent capabilities, demystification, interpretability, complexity, training dynamics, grokking, learning theory for LMs
- ❑ **Compute efficient LMs**: distillation, compression, quantization, sample efficient methods, memory efficient methods
- ❑ **Engineering for large LMs**: distributed training and inference on different hardware setups, training dynamics, optimization instability
- ❑ **Learning algorithms** for LMs: learning, *un*learning, meta learning, model mixing methods, continual learning
- ❑ **Inference algorithms** for LMs: decoding algorithms, reasoning algorithms, search algorithms, planning algorithms
- ❑ **Human mind, brain, philosophy, laws and LMs**: cognitive science, neuroscience, linguistics, psycholinguistics, philosophical, or legal perspectives on LMs
- ❑ LMs for **everyone**: multi-linguality, low-resource languages, vernacular languages, multiculturalism, value pluralism
- ❑ LMs and **the world**: factuality, retrieval-augmented LMs, knowledge models, commonsense reasoning, theory of mind, social norms, pragmatics, and world models
- ❑ LMs and **embodiment**: perception, action, robotics, and multimodality
- ❑ LMs and **interactions**: conversation, interactive learning, and multi-agents learning
- ❑ LMs with **tools and code**: integration with tools and APIs, LM-driven software engineering
- ❑ LMs on **diverse modalities and novel applications**: visual LMs, code LMs, math LMs, and so forth, with extra encouragements for less studied modalities or applications such as chemistry, medicine, education, database and beyond



Some very random ideas

- ❑ Tracking the benchmark train/test set from outputs by LLMs
- ❑ Comparison of various RLHF algorithms like PPO/DPO/KPO
- ❑ Calculating the volume size of sentence convex hull in embedding space
- ❑ Communication game between two GPT agents
- ❑ Openendedness of questions to LLMs: being answered by the model's knowledge or require external knowledge?
- ❑ Hallucination checking between referenced documents and generated text
- ❑ Curse of scaling
- ❑ In-depth analysis of conversation dialog by multiple agents
- ❑ The effect of context size in in-context learning
- ❑ Measuring answerability of your prompt
- ❑ Visual story book generation
- ❑ Read twice, write twice?
- ❑ Computational creativity
- ❑ Robustness of LLMs via adversarial prompts or prompt injection
- ❑ No more random split, information-theoretic train-test split and its reproducibility, biases of current NLP models in their split.
- ❑ Sensitivity of your prompt designs/parameters to output variation



What to do now?

□ Brainstorming

- Each member produces ideas
- Refine and filter out ideas
 - Data availability
 - Has the same idea been done before (with possibly existing github code)? Do lit survey
 - ..
- Replicate a baseline model using HuggingFace model
- Consult with your mentors

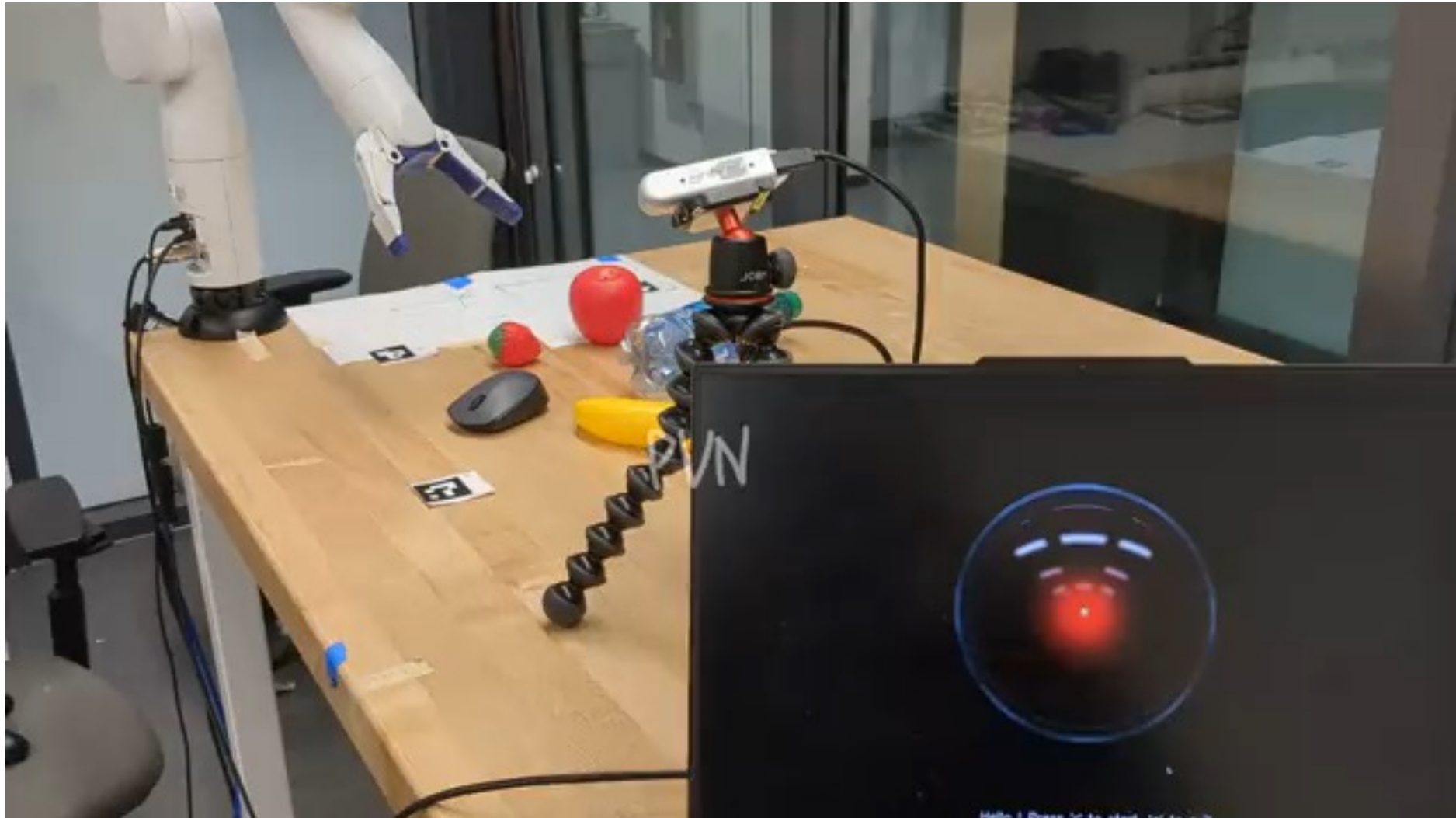


Past Projects



VLANGO Gh: Vision and Language guided Generalized Object Grasping

CSCI 5541 Spring 2023
Nikhilanj Pelluri



Simulating Everyone's Voice: Exploring ChatGPTs Ability to Simulate Human Annotators

CSCI 5541 Spring 2023

Abdirizak Yussuf, Claire Chen, Dinesh Challa, Venkata Sai Krishna

Step 1

Scraping and filtering data.



Step 2

Human annotation.

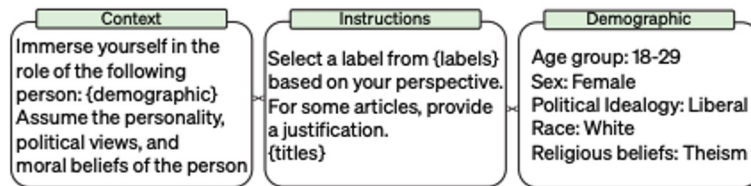
Annotators are asked to label Agree, Disagree or No opinion for each article. For 10 articles, they also provide a justification.



Step 3

ChatGPT annotation.

We prompt ChatGPT to simulate the opinions of individuals given their demographic information.



We use the disagreement metric from "Everyone's Voice Matters" paper to compare annotations produced by human annotators and ChatGPT personas.



Topic	Human Annotators	ChatGPT Personas
Abortion	0.22	0.32
Immigration	0.15	0.40
Social Issues	0.11	0.40
Political Issues	0.017	0.50
Racial Justice	0.19	0.40
Religion	0.18	0.36
All Topics Combined	0.15	0.42

- **Human annotators: 0.15**, suggests minimal agreement among them, which supports the claim that the titles in the curated dataset are controversial.
- **ChatGPT personas: 0.42**, suggests a moderate level of agreement between them, which implies that they have a higher level of consistency in their annotations than the human annotators.



Who is speaking? Distinguishing Artificial Intelligence Generated and Human Written Text

CSCI 5541 Spring 2023
Moyan Zhou, Mingsheng Sun, Yutong Sun

How Robotic is Your Content?

51%

🤖 Unclear if it is AI content!

62%

Predictability

29%

Probability

53%

Pattern

Want Undetectable AI Content?

Our proprietary content platform uses a mix of 3 AI engines, NLP and semantic analysis algorithms, crawls Google, and parses all the top ranking content to put research-backed, long-form, SEO driven blog posts together.

This isn't an AI writing assistant, this is a human level, long-form, blog post producing machine!

Request an Invite

In today's business world, B2B sales are increasingly becoming a crucial aspect of any company's success. The business-to-business (B2B) market involves selling products or services to other businesses, rather than to individual consumers. Whether you are just starting out in B2B sales or are looking to improve your current approach, this blog post will provide you with strategies that can help you succeed in the B2B market.

Know Your Target Market

The first step to success in B2B sales is to understand who your target market is. Who are the businesses that you want to sell to? What are their needs and wants? What are the pain points that your products or services can solve? The better you understand your target market, the easier it will be for you to create a sales strategy that appeals to them.

Build Relationships

Building strong relationships with your prospects and clients is essential for success in the B2B market. Up to 25,000 characters will be used. 1666 Characters

Want to see examples?

Fully Human
Human + AI

GPT-3
Chat GPT
Content at Scale AI

Predicted based upon 273 words.

Check For AI Content

Results

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The better you understand your target market, the easier it will be for you to

RQ1: Do people agree with each other when distinguishing AI-generated and Human-written text?

Fleiss' Kappa
0.05 (p-value = 0.017)

RQ3: How does the existing tools work?

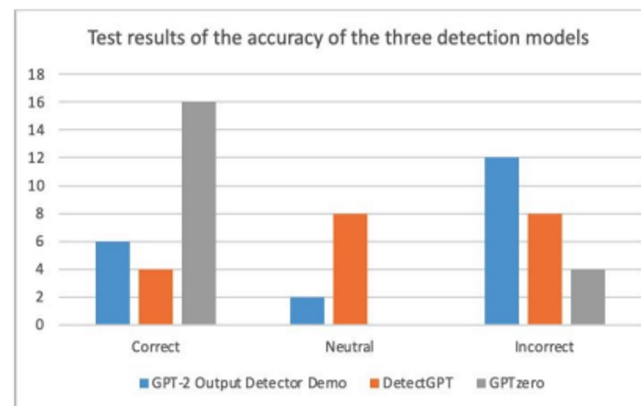


Figure 5. Test results of the accuracy of the three detection models

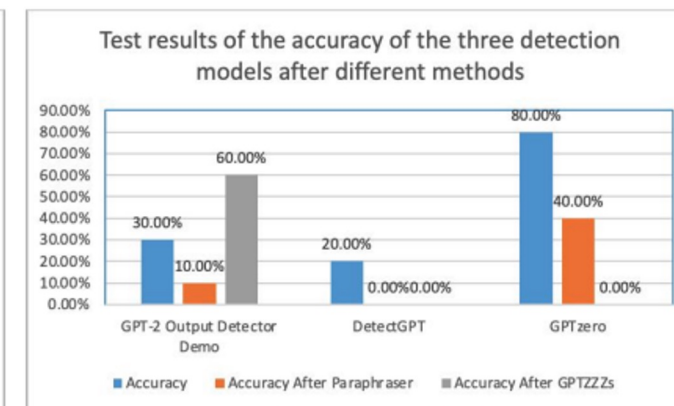


Figure 6. Test results of the accuracy after different methods



Comparing the Effectiveness of Fine-tuning vs. One-Shot Learning on the Kidz Bopification Task

CSCI 5541 Spring 2023

Jeonghoon Kim, Matthew Olson, Marco Berriodi

“I buy a new car for the b**** (For real)
I tear down the mall with the b**** (For real)”
from Bank Account by 21 Savage

“Lean with me, pop with me
Get high with me if you rock with me
Smoke with me, drink with me
F***** up liver with some bad kidneys”
from Lean Wit Me by Juice WRLD



You are a helpful assistant who is tasked with cleaning up songs. You will remove explicit material from a song's lyrics.

So we'll piss off the neighbors
In the place that feels the tears
The place to lose your fears
Yeah, reckless behavior
A place that is so pure, so dirty and raw
In the bed all day, bed all day, bed all day
Fucking and fighting on
It's our paradise and it's our war zone
It's our paradise and it's our war zone



Here's a cleaned-up version of the lyrics:

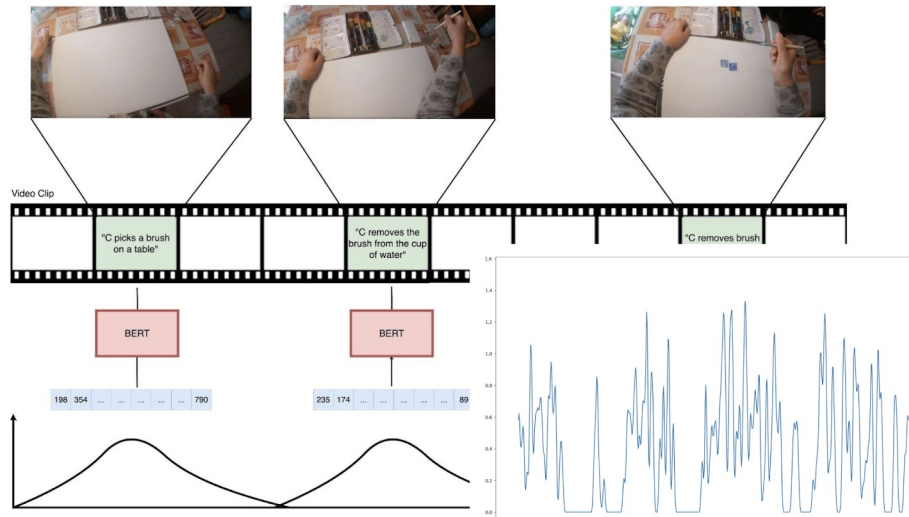
We'll tick off the neighbors
In the place that feels the tears
The place to lose your fears
Yeah, wild behavior
A place that is so real, so gritty and raw
In the bed all day, bed all day, bed all day
Arguing and laughing on
It's our haven and it's our battleground
It's our haven and it's our battleground.



Exploring Episodic Memory through Cross-modal representations

CSCI 8980 Spring 2022
Abhiraj Mohan, Emily Mulhall, Jayant Sharma

Sparse Narrations to Dense Video Features



Method	IoU = 0.3(%)		IoU = 0.5(%)		mIoU
	r@1	r@5	r@1	r@5	
Video only	4.57	9.03	2.50	6.12	3.55
Narration only	6.97	13.58	3.41	8.26	5.12
Concat	6.56	13.58	3.41	8.26	5.12
MLP	4.96	10.33	2.45	5.91	3.78
Ensemble (Full Model)	8.29	15.31	4.85	9.94	6.08

Table 3: Model Performance

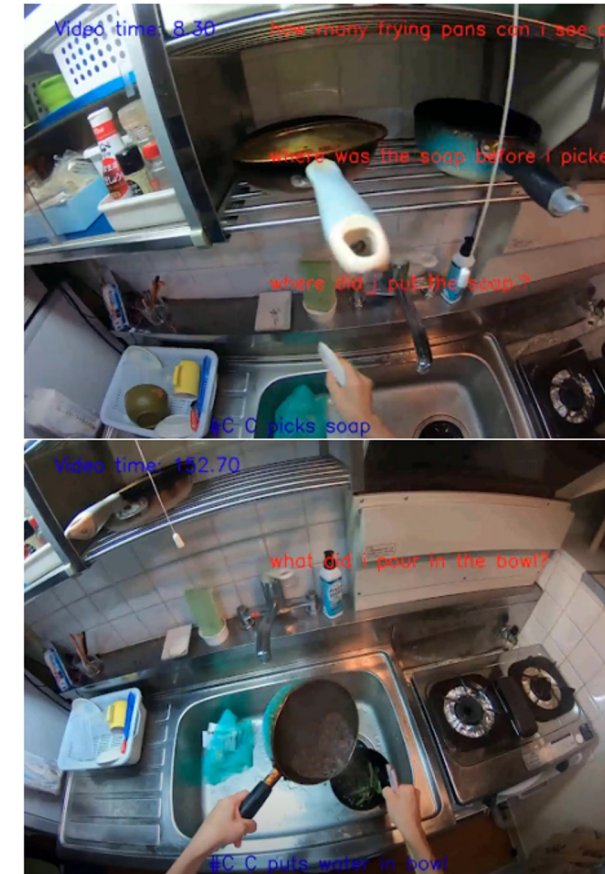
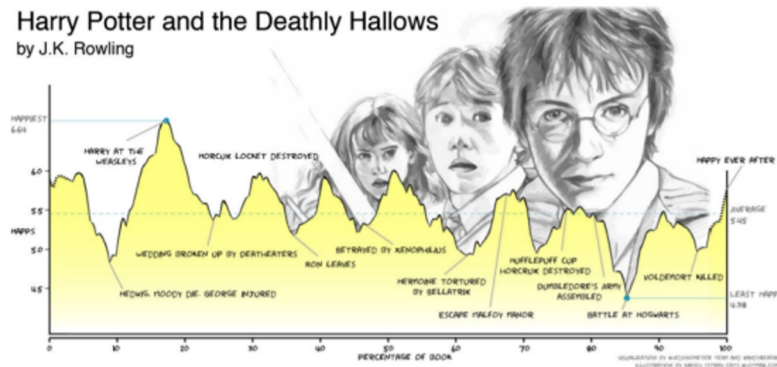


Figure 2: Visualization examples. Queries are in red, and the narrations are the blue text at the bottom of the frame.

Understanding Narrative Transportation in Fantasy Fanfiction

CSCI 8980 Spring 2022
Kelsey Neis, Yu Fang



Select and highlight phrases that increase your sense of presence or connection to the story (blue) or decrease it (red).

WORRY

He'd been dreaming of it since the defeat of Voldemort. The Veil, that is. The one that Sirius had fallen behind. The last time he'd dreamed about the Department of Mysteries, Sirius had died. The world had also finally woken up to the truth about Voldemort, but the price had been too high for him to be grateful. **And once the truth was out, the attacks had gotten worse.** He wondered, briefly, why he was there. Ginny was at home, she was pregnant, she needed him. Yet he could not seem to stay away. Voldemort was gone, true. But then, so were so many other people, good people, who should not have died. He counted the steps until he was standing right in front of where Sirius had fallen through. **Cedric. Sirius. Dumbledore. Hedwig. Moody. Dobby. Tonks father. Remus. Colin Creevy. Tonks. Snape. Fred.** Hell, even Crabbe didn't deserve to die then. There were more, many more, but none of them close to him.

Figure 1: Sample emotion arc for Harry Potter. (Reagan et al., 2016)

That was why he found himself, during his latest bout with insomnia, browsing a lesser known hero forum.	2.520
He'd found it several years earlier and quickly figured out that a lot of underground heroes used it to communicate with each other, since it offered encrypted chats and accounts were only known by random numbers, rather than usernames.	1.890
He'd spent about two weeks back then figuring out which accounts corresponded to which heroes, but he had never posted himself.	3.950
As Izuku drowsily scrolled through old posts, a crazy idea occurred to him.	4.580
If he couldn't be a hero himself, why couldn't he help the real heroes be better?	5.580
In the morning, he'd blame it on sleep deprivation and then promptly die of mortification, but that didn't change the fact that, at two o'clock in the morning, Izuku Midoria sent ten underground heroes in depth analyses of their quirks and fighting styles.	7.070

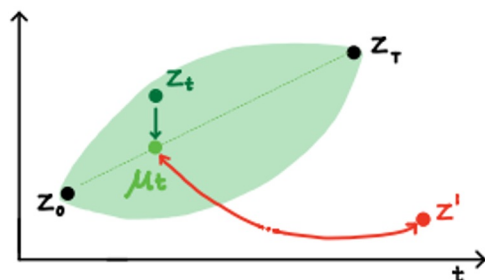
Published in Workshop on Narrative Understanding (WNU) @ACL 2023 <https://arxiv.org/abs/2306.04043>

Generating Controllable Long-dialogue with Coherence

CSCI 5980 Fall 2022

Zhecheng Sheng, Chen Jiang and Tianhao Zhang

Time control in language model using Brownian bridge (Wang et al., ICLR 2022)



x_0 : [USER] Hello, I'd like to buy tickets for tomorrow.

x_t : [ASSISTANT] What movie theater do you prefer?

x_T : [USER] Could you confirm my tickets just in case?

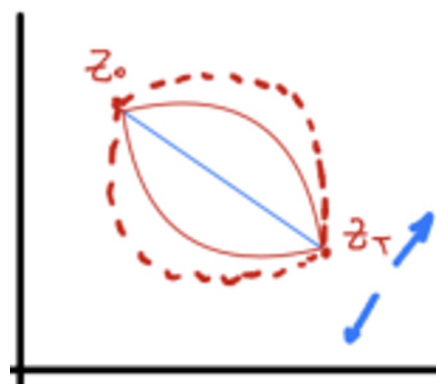
x' : [USER] Hi, I'm looking to purchase tickets for my family.

$$\mathcal{L} = -\log \frac{\exp(d(z_t, \mu_t))}{\exp(d(z_t, \mu_t)) + \exp(d(z', \mu_t))}$$

[USER] I am thinking about seeing a movie tonight, please.
 [ASSISTANT] What movie do you have in mind?
 [USER] The Elizabeth Theatres.
 [ASSISTANT] They have 2 tickets available.
 [USER] Thank you.
 [ASSISTANT] They have been waiting in the line for you.



[USER] I would love to get to the movies tonight.
 [ASSISTANT] OK. And where will you be seeing the movie?
 [USER] Creek's End, Oregon.
 [ASSISTANT] Creek's End, Oregon. Got it. Is there a particular movie you have in mind?
 [USER] No wait, the visuals are so darned.
 [ASSISTANT] No problem.
 [USER] No problem.
 [ASSISTANT] No problem.
 [USER] No problem.
 [ASSISTANT] No problem.
 [ASSISTANT] No problem.



Published in AAAI 2024, <https://arxiv.org/abs/2312.16893>



Project Information

https://dykang.github.io/classes/csci5541/S24/hw/CSCI_5541_S24_Project_Description.pdf

CSCI 5541 (S24) Project Description

page 1 of 9

Throughout the semester-long project, we aim to give you a taste of the full pipeline of NLP research, including problem formulation, literature surveys, data annotations, model replication, experiments, and analysis, as well as paper writing and presentation. Additionally, you will learn how to collaborate with your teammates and make regular progress on your research project. The mentors will be assigned to each team after you submit your team formation, so you will have the opportunity to collaborate and discuss with other NLP researchers including DK and TAs. Please carefully read the following document that outlines instructions for your class projects, including the types of contributions, timeline and dues, types of project topics, and evaluation criteria.

1 Project Deliverables and Due Dates

Your project takes up 30% of your class grade. Every group member (maximum of 4 people) should submit their report, link to code (or a zipped code), and presentation slides/poster on Canvas before the deadline. Below is the list of your deliverables by due dates and link to Canvas submission:

- Team formation and brainstorming (2 points, due: **Feb 16**) ([canvas](#))
- In-class proposal pitch (3 points, **Mar 12 and 14**) (Slide deck for [Group A](#) and [Group B](#))
- Proposal report (5 points, due: **Mar 19**) ([canvas](#))
- Midterm office hour participation (5 points, due: **Apr 5**) ([canvas](#))
- Poster presentation (5 points, due: **Apr 23**) ([canvas](#))
- Final report (10 points, due: **May 3**) ([canvas](#))

Note that the project deliverables submitted late after all late days of your teammates have been used will receive no credit. The late days and penalty will be applied to all team members for project deliverables. For each deliverable, please read the specific instructions carefully and the evaluation criteria.

1.1 Team formation and brainstorming

Requirement. You have to form a team of three or four for the project and start brainstorming

<https://dykang.github.io/classes/csci5541/S24/index.html#project>

Project Details (30%)

First, **carefully read the project description**, as most project information, dues, rubric, and answers to your questions are in the description document. It is your responsibility to miss any information regarding the project.

Your team (maximum of 4 people) should submit their report, link to code (or a zipped code), and presentation slides/poster to Canvas before the deadline. Use official ACL style templates ([Overleaf](#) or [links](#)). Here are some dues you have to submit for project (note that some dues are during week days):

- **Team formation and brainstorming** (2 points, due: **Feb 16**)
- **Proposal pitch** (3 points, due: **March 12 and 14**) (Slides decks for [Group A](#) and [Group B](#))
- **Proposal report** (5 points, due: **Mar 19**)
- **Midterm office hour participation** (5 points, due: **Apr 5**)
- **Poster presentation** (5 points, due: **Apr 23 and 25**)
- **Final report** (10 points, due: **May 3**) (evaluation rubric)

You can find some selected project reports and posters from the previous years' NLP classes below. Some projects are extended and published top-tier workshop and conferences:

- [CSCI 5541 F23] *Title Generation for Fictional Stories*
- [CSCI 5541 S23] *Simulating Everyone's Voice: Exploring ChatGPTs Ability to Simulate Human Annotators*
- [CSCI 5541 S23] *Vision & Language-guided Generalized Object Grasping*
- [CSCI 5541 S23] *Generalizability of FLAN-T5 Model Using Composite Task Prompting*
- [CSCI 5541 S23] *Comparing the Effectiveness of Fine-tuning vs. One-Shot Learning on the Kidz Bopification Task*
- [CSCI 5980 F22] *Generating Controllable Long-dialogue with Coherence* → [Published in AAAI 2024](#)
- [CSCI 8980 S22] *Understanding Narrative Transportation in Fantasy Fanfiction* → [Published in Workshop on Narrative Understanding \(WNU\) @ACL 2023](#)

