

Nilay Patel

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EDUCATION

- Ph.D in Computer Science** @ University of California, Santa Cruz 2022→
Advisor: Jeffrey Flanigan
Relevant Courses: Natural Language Processing I-III, Adv. Deep Learning for NLP, Linguistics, Group & Ring Theory, (Abstract) Linear Algebra, Real Analysis, Measure Theory
- M.S. in Natural Language Processing** @ University of California, Santa Cruz ◊ GPA: 3.93/4 2020→2021
- B.S. in Computer Science & Applied Math** @ Florida State University ◊ GPA: 3.70/4 2016→2020

RESEARCH

Towards Improved Multi-Source Attribution for Long-Form Answer Generation (*NAACL 2024*)

Patel et al., 2024.

Investigated multi-source attribution abilities of LLMs, and demonstrated a simple approach to augment existing QA data for this task. Also, introduced PolitiCite, a very-long-form multi-source QA dataset.

A New Approach Towards Autoformalization (*preprint on arXiv*)

Patel, Saha, and Flanigan, 2023.

Proposed a new approach towards autoformalization of mathematics by breaking the problem into four simpler subtasks which LLMs (e.g.) are better at handling. Also provides a hand-curated dataset of 50 examples for subtask 1.

Forming Trees with Treeformers (*RANLP 2023*)

Patel and Flanigan, 2023.

Demonstrated the addition an inductive bias for learning hierarchical structure significantly improves performance of a transformer on tasks such as translation, summarisation, natural language understanding, and compositional generalization.

Knowledge Distillation in Multiple Steps (*M.S. Capstone Project*)

(Patel, Alsalihiy, King, and Parthasarathy, 2021.)

Demonstrated that improved performance of a “teacher” model does not correlate with student model perplexity, but can be mitigated by distilling in multiple steps.

Recommendation Algorithms for Student Evaluation Data (*Undergraduate Honors Thesis*)

(Patel, 2019.)

Built a recommender system to match professors and courses based on student evaluations.

SKILLS

Languages	Python, Lean, Haskell, SQL, C/C++, {Java/Type}Script, Julia
Frameworks/Libraries	PyTorch, huggingface, numpy/scipy, pandas, matplotlib/seaborn, sklearn
Tools	Docker, Git, standard Unix tooling, L ^A T _E X, LLMs

WORK HISTORY

Applied Scientist Intern @ Amazon AI June 2023 - December 2023
Worked with large language models on challenging problems in open-domain web question-answering.

Software Engineer @ Computational GeoInterpretation September 2021 - July 2022
Designed and productionized state-of-the-art geophysical image segmentation AI.

- Researched & implemented new methods, improving AI image segmentation training & inference speed
- A complete (solo) redesign/rewrite of our data storage and loading software to improve speed, scalability, usability, and maintainability (halved total code).

Frontend Developer (Intern) @ Diverse Computing Inc. January 2018 - June 2018
Developed web applications for various law enforcement applications. Designed efficient databases, responsive UIs, and optimized backend code.