

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

A New Approach Towards Autoformalization (<i>In Submission @MATHAI 2023</i>) (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 (<i>RANLP 2023</i>)	(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 (<i>M.S. Capstone Project</i>) (Patel, Alsalihi, 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 (<i>Undergraduate Honors Thesis</i>)	(Patel, 2019.)
Built a recommender system to match professors and courses based on student evaluations.	

SKILLS

Languages	Python , Haskell, SQL, C/C++, Javascript, 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.	
<ul style="list-style-type: none">• 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. Responsibilities included	
<ul style="list-style-type: none">• Developing the front-end in AngularJS• Writing comprehensive end-to-end test suites• Designing efficient databases	