Nathan Kim

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EDUCATION

Stanford University **Stanford, CA**
BS, Computer Science *Expected June 2023*
GPA: 3.93, Co-curricular involvement: KZSU 90.1 FM, Stanford ACMLab
Key Coursework: NLP w. Deep Learning (Best Project), Machine Learning (Best Project), Deep Generative Models

RESEARCH

How Does Context Arise in Contextual Embeddings Geometry? **In Preparation**
Nathan Kim, Isabel Papadimitriou, Dan Jurafsky*
While the broad and expressive linguistic capabilities of large language models are widely attributed to the *contextualization* induced by encoder self-attention, a clear link between contextualization and the embedding space itself has yet to be precisely articulated. We find that embeddings can be clustered by linear context, although this arrangement does not encode higher-order linguistic structure.

GLARE: Infilling Language Models for Textual Adversarial Attacks **In Preparation**
Nathan Kim, Ryan Chi*, Ethan Chi*
Textual adversarial examples can expose serious security vulnerabilities in NLP models by illustrating where small perturbations in input texts can drastically alter their predictions. We find that the GPT-2 adapted to perform non-causal infilling (Donahue et al. 2020) outperforms existing adversarial example generation methods in fluency, semantic preservation and attack success rates.

WORK EXPERIENCE

Canal **June 2022—**
Frontend Engineer
- Creating seamless experiences in Typescript + GraphQL + Django for our Shopify e-commerce applications moving over$500k in GMV

Elevated Interest **April 2021 – June 2021**
Student Intern
- Designed core schema for a multimodal online lesson delivery platform now in use by students at East Palo Alto schools
- Ported a legacy Ruby on Rails backend API in MongoDB & Express to assist migration to modern MERN stack

PROJECTS & VOLUNTEER WORK

Stanford ACM **September 2021—**
Chair, MLab Reading Group
- Constructed 10-week curriculum for tutorial series designed to expose beginner ML students to major ideas at the foundations and forefronts of AI research and build competencies in finding & interpreting written research
- Recruiting Stanford undergraduate researchers to present to 100+ MLab students on ongoing work in NLP, CV & other topics

ArMol **September 2019—**
Creator/Co-founder/Lead Developer
- Developed cross-platform React Native mobile app which constructs models of molecular structures from user-input molecule names and displays the result in AR; published on the Google Play Store
- Developed server-side modelling pipeline for user-input molecules using structure data queried from PubChem API
- Designed a flush, modern frontend UI in Tachyons CSS

AWARDS
- Gold Medal Division, 2020 Asia Pacific Linguistics Olympiad
- Student Honor Roll, 2018 Canadian Computing Competition
- Silver Medalist, 2019 International Linguistics Olympiad

SKILLS
- Pytorch, Pandas, R, HTML, CSS (Tailwind), React.js, Vue.js, Flask, Node.js, Java, React Native, C++, Rust