Fabrice Harel-Canada

Software Engineer · Computer Science Researcher

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Biography

I am a computer science PhD student at UCLA where I am part of the Software Evolution and Analysis Lab and advised by Miryung Kim. I also work with Violet Peng in the PLUS Lab and Quanquan Gu in the Statistical Machine Learning Lab. My research aims at developing new techniques for training, testing, and evaluating ML systems. Previously, this has entailed devising novel adversarial attacks, investigating test metrics like neuron coverage for deep learning models, and proposing sibylvariant transformations to improve model generalization and robustness. My current projects span two distinct areas: a) developing fine-grained data lineage to support the creation of automated data augmentation policies and data exploration; b) producing reference-free evaluation metrics to measure the diversity and engagingness of natural language generation systems.

Education

University of California, Los Angeles (UCLA)

Advisor: Miryung Kim

PhD | Computer Science

Jan 2020 - Jun 2023

- 3.92 / 4.00 GPA
- Majors: Software Engineering + Artificial Intelligence
- Minor: Data Science Computing

University of California, Los Angeles (UCLA)

Advisor: Miryung Kim

MS | Computer Science

Sept 2018 - Dec 2019

- Major: Artificial Intelligence
- Thesis: *Is Neuron Coverage a Meaningful Measure for Testing Deep Neural Networks?*

University of Florida (UF)

BS | Business Administration

Aug 2008 - May 2012

- Majors: Management + Information Systems and Operations Management
- Minors: Entrepreneurship + Finance
- Thesis: *The Viability of the Student-Run Housing Cooperative: A Case Study of the Cooperative Living Organization*

Publications

Sibylvariant Transformations for Robust Text Classification

Findings of ACL 2022

Acceptance Rate: 37 %

Fabrice Harel-Canada, Muhammad Ali Gulzar, Nanyun Peng and Miryung Kim, in *Findings of the Association for Computational Linguistics: ACL 2022, pages 1771–1788, Dublin, Ireland. Association for Computational Linguistics.*

Is Neuron Coverage a Meaningful Measure for Testing Deep Neural Networks?

ESEC/FSE 2020

Acceptance Rate: 28 %

Fabrice Harel-Canada, Lingxiao Wang, Muhammad Ali Gulzar, Quanquan Gu and Miryung Kim, in *Proc of ACM SIGSOFT International Symposium on the Foundations of Software Engineering (ESEC/FSE)*, Sacramento, California, USA, 2020.

Research Experience

University of California, Los Angeles

Supervisor: Miryung Kim

Graduate Student Researcher

June 2019 - present

- Developing automated evaluation metrics for natural language generation systems - e.g. diversity, engagement
- Designed a new class of sibylvariant data transformations, releasing an open source tool for the community [Sibyl]
- Evaluated the reliability of testing metrics for deep learning
- Developed diversity-promoting extensions to adversarial attack algorithms

University of California, Los Angeles

Supervisor: Judson Caskey

Research Assistant

July 2020 - Oct 2020

- Conducted LDA topic modeling and phrase-level sentiment analysis using BERT transformers on millions of Amazon and Glassdoor product / employer reviews

Professional Experience

Axenzi Consultants

CEO — *Oct 2018 - present*

- Helping clients to plan and implement technology projects - specs, devops, application development, and database development

University of California, Los Angeles

Supervisor: Miryung Kim

Teaching Assistant, CS 130 : Software Engineering — *Sept 2020 - Dec 2020*

- Developed teaching materials, activities, and exam questions that reinforced the lectures and gauged conceptual proficiency.

University of California, Los Angeles

Supervisor: Carlo Zaniolo

Reader, CS 143 : Database Systems — *Jan 2019 - Mar 2019*

- Developed test cases for a Spark project in Scala, actively addressed student questions, and assisted students with project work

Verox Tech

Supervisor: Michael Simhai

Project Manager + Developer Team Lead — *July 2015 – Sept 2018*

- Designed and successfully launched a smarter insurance app by building, motivating, and guiding a team of 23
- Contributed 100s of check-ins, primarily consisting of C# Web APIs and database tables, triggers, sprocs, and T-SQL scripts
- Designed and implemented a 3-system legacy data migration
- Responsible for producing, coordinating and reviewing nearly every aspect of the SDLC:
  - code reviews and code optimization
  - requirements and spec generation
  - database design + SSIS + SSRS
  - technical documentation
  - UI design standards + product design
  - build and deployment scripts

People's Trust Insurance

Supervisor: Scott Thompson

Business + Data Analyst — *Dec 2012 – Sept 2018*

- Go-to data expert for executives to produce hundreds of reports and analyses for pivotal decision making at the executive level
- Developed numerous front-end / back-end application features that were successfully deployed into production to automate tedious and time-intensive workflows
- Performed continuous requirements gathering & demos with business stakeholders to support 60+ sprints of development for both applications and business intelligence teams, including the transition to a new policy and claim management system

Cooperative Living Organization

President — *Dec 2010 – May 2012*

- Appointed and oversaw the performance of 17 managers who were responsible for executing the policies and procedures I developed
- Increased house occupancy from 60 residents to full capacity (80) and increased net income 57% while expanding services & activities for residents

Skills

Programming	sql, python, java, c#, linq, html, css, js, scala, problog, prolog, LaTeX
Frameworks	pytorch, tensorflow, keras, spark, numpy, pandas, scipy, sklearn, opencv, matplotlib, seaborn
Tools	ssms, ssis, ssrs, tfs, azure devops, visual studio, excel, aws, gcp, exchange server, moqups

Selected Coursework

2022	**Natural Language Generation**, CS 269	*UCLA*
2022	**Automated Testing 4 Data Systems**, CS 239	*UCLA*
2021	**Large-Scale Data Mining**, EC 219	*UCLA*
2021	**Large-Scale Social and Complex Networks**, EC 232E	*UCLA*
2020	**Reinforcement Learning**, EC 239AS	*UCLA*
2020	**Machine Learning Algorithms**, CS 260	*UCLA*
2020	**Probabilistic Programming**, CS 267A	*UCLA*
2019	**Neural Networks and Deep Learning**, EC 239AS	*UCLA*
2019	**Natural Language Processing**, CS 269	*UCLA*
2019	**ML Testing and Debugging**, CS 239	*UCLA*
2018	**Advanced Data + Knowledge Bases**, CS 240B	*UCLA*

Honors & Awards

2019	**Magna Cum Laude**, 3.90 / 4.00 GPA	*UCLA*
2012	**Magna Cum Laude**, 3.85 / 4.00 GPA	*University of Florida*
2008 - 2012	**Recipient**, Bright Futures Academic Scholarship	*University of Florida*
2011 - 2012	**Recipient**, Anderson Scholar with Distinction	*University of Florida*

Extracurricular Activity

2020-2021	**Mentor**, Queers in STEM	*Los Angeles, CA*
2019	**Volunteer**, TreePeople	*Los Angeles, CA*
2018	**Volunteer**, Gay for Good (G4G)	*Los Angeles, CA*
2017	**Volunteer**, Los Angeles LGBT Center	*Los Angeles, CA*
2014	**Volunteer**, Stonewall Pride	*Wilton Manors, FL*
2009	**Volunteer Counselor**, CDS Interfaith Youth Shelter	*Gainesville, FL*
2009	**Co-founder, Editor, Contributor**, Florida Inquiry Journal	*Gainesville, FL*
2009 - 2010	**Volunteer**, Habitat for Humanity	*Fort Lauderdale, FL*
2008 - 2012	**Member**, UF Entrepreneurship Club	*Gainesville, FL*