

# FABRICE HAREL-CANADA

## SOFTWARE DEVELOPER

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📍 Los Angeles, CA

## EXPERIENCE

### Graduate Student Researcher

#### University of California, Los Angeles

📅 Jun 2019 – Present

📍 Los Angeles, CA

- Evaluated the reliability of testing metrics for deep learning
- Developed extensions to adversarial attack algorithms

### Software Development Consultant

#### Axenzi Consultants

📅 Oct 2018 – Present

📍 Los Angeles, CA

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

### Course Reader

#### University of California, Los Angeles

📅 Jan 2019 – Mar 2019

📍 Los Angeles, CA

- CS 143: Database Systems | Developed test cases for a Spark project in Scala and actively addressed student questions

### Project Manager + Developer Team Lead

#### Verox Tech

📅 July 2015 – Sept 2018

📍 Los Angeles, CA

- 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
  - server setup / config
  - build and deployment scripts

### Business + Data Analyst

#### People's Trust Insurance

📅 Dec 2012 – Sept 2018

📍 Deerfield Beach, FL

- 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

## OBJECTIVE

Highly-motivated to add value as a data scientist, build useful tools, and leverage + expand my database development, machine learning, and leadership skills.

## EDUCATION

### Computer Science PhD

#### University of California, Los Angeles

📅 Jan '20 – Dec '23

📊 3.92 / 4.0 GPA

- Neural Networks and Deep Learning
- ML Testing and Debugging
- Natural Language Processing
- Advanced Data + Knowledge Bases

### Computer Science MS

#### University of California, Los Angeles

📅 Sept '18 – Dec '19

📊 3.9 / 4.0 GPA

### BS Information Systems

#### University of Florida

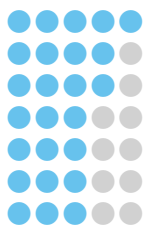
📅 Aug '08 – May '12

📊 3.85 / 4.0 GPA

- Magna cum Laude + Thesis

## SKILLS

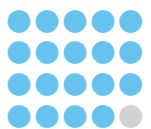
t-sql  
python  
pytorch  
tensorflow + keras  
spark  
java  
c#



numpy pandas scipy sklearn  
opencv matplotlib plotly seaborn  
linq html css js

## TOOLS

ssms + ssis + ssrs  
tfs + azure devops  
visual studio  
excel



jupyter office LaTeX aws gcp  
exchange server moqups wordpress

## RESEARCH + PROJECTS

### Relational Stock Price Prediction using GNNs

University of California, Los Angeles

📅 3 mos

- Approximating company-to-company relationships from stock data
- Initialize relations with 30-day rolling correlations; train them using GNNs
- Predictions within 75% of optimal for NYSE; 35% of optimal for NASDAQ

### Test Metrics for Deep Neural Networks (DNNs)

University of California, Los Angeles

📅 5 mos

📍 FSE 2020

- Formalized properties expected of useful test suites for DNN testing
- Devised a new regularizer to induce higher network activations
- Conducted a massive evaluation across 1500+ experimental configurations to determine the reliability of DNN test metrics. One of the most popular metrics, *neuron coverage*, does not correlate with defect detection, input realism, or output diversity.

### Machine Learning on Source Code

University of California, Los Angeles

📅 3 mos

- Trained a Google Transformer network to perform two tasks on Java and Python code bases:
  - Intake a function and output a plain English summary of what it does.
  - Intake a code snippet and output a syntactically valid function name.

### Insurance Claim Predictions

University of California, Los Angeles

📅 2 mos

- Data extraction from 4 sources with extensive preprocessing and imputations performed via SQL and Python
- Overcome class imbalance issues via SMOTE and oversampling
- Developed a non-blocking implementation of a Naive Bayes Classifier (NBC) for Spark Streaming, directly calculating frequencies and conditional probabilities using PySpark and SparkSQL to make real-time predictions for claims in a high-volume environment
- Implementation and tuning of 11 other models resulted in the top performer being a XGBoost classifier with a 93% F1 score

### Differential State Analysis and Targeted Input Selection

University of California, Los Angeles

📅 2 mos

- Explored how to identify layers with the highest proportion of underperforming neurons and then using their weights to generate heat maps that can be used to identify subsequent training batches for overfitting / underfitting issues on underperforming classes
- Reduces average training time by 90% and improves performance by 10%

### CNN & RNN Applications in EEG Decoding

University of California, Los Angeles

📅 1 mos

- Achieved state-of-the-art prediction accuracy on BCI Competition classification of user action from neural signals by implementing and extending upon architectures from several leading papers.

## INTERESTS

machine learning statistics logic  
software engineering board games  
video games philosophy cooking  
design travel self-improvement

## REFERENCES

**Prof. Miryung Kim**

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**Prof. Quanquan Gu**

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**Michael Simhai**

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**Lisa Branon**

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