Chris Foster

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Professional Experience

Chief Technology Officer

June 2019 - Present | Remote

Two Story Robot Labs Inc.

Technical leadership role as the co-owner and CTO of a botique consulting company specializing in web application development and machine learning. My position focuses on engineering and architecture while also involving management, coaching, business development, hiring, strategic planning, and product responsibilities. I work with modern technologies including React, GraphQL, Node, Docker, AWS, MongoDB, Postgres, and Kubernetes.

Software Developer

September 2016 - June 2019 | Remote

Two Story Robot Labs Inc.

Full stack developer for multiple SaaS products, and consulting for both government and private organizations. While I primarily focused on engineering and architecture, the consulting positions often required support, research, data science, and mentoring roles. I developed with modern technologies including Javascript, Node, AWS, C++, Elasticsearch, RethinkDB, Angular, RabbitMQ, CouchDB, Docker, React, Apollo, GraphQL, and Redux.

Software Developer

September 2012 - September 2016 | Kamloops, B.C.

MemoryLeaf Media Inc.

Full stack web application developer for multiple company SaaS products, as well as external contracting work for government and private organizations. Primarily worked with Javascript. Developed with technologies such as Node, Backbone, Marionette, jQuery, Elasticsearch, MongoDB, Angular, CouchDB, RethinkDB, Docker, and React.

Freelance Web Developer

April 2011 - November 2012 | Kamloops, B.C.

Independent Professional

Freelance web developer for a number of local businesses, organizations, and government entities. Many smaller projects focusing on simple web design for commercial businesses or community outreach, with a few larger projects consisting of full stack web applications made to handle large amounts of data and users. Websites were designed in raw HTML/CSS and web applications were built with MySQL, PHP, jQuery, and Backbone.

Education

Master of Science
Major in Computing Science
Research in Machine Learning and Computational Neuroscience
September 2016 - June 2019
University of Victoria, Victoria, British Columbia

Bachelor of Computing Science
Specialization in Software Engineering
Awarded the TRU Medal of Computing Science for highest graduating GPA
September 2012 - June 2016
Thompson Rivers University, Kamloops, British Columbia

Conferences and Publications

Words as a window: Using word embeddings to explore the learned representations of Convolutional Neural Networks
Dhanush Dharmaretnam, Chris Foster, Alona Fyshe
Neural Networks, Volume 137, 2021
This research shows different neural networks will build internal representations of knowledge which have similar patterns. We showed that the values in semantic models such as Skip-Gram have a correlation to the activations in convolutional neural networks like Inception-v3. Despite the fact that one is trained only on images and the other is trained only on text, they appear to learn similar representations of a word or image of the same semantic entity.

Improving Response Time Prediction for Stack Overflow Questions
Di Wu, Simon Johnson, Chris Foster, Erwin Li, Haytham Elmiligi, Musfiq Rahman
IEEE 10th Annual Information Technology, Electronics and Mobile Communication Conference
October 2019 - Vancouver, Canada
This research proposes a new machine learning model to predict the response times for questions posted on Stack Overflow. Our proposed problem formulation focuses on whether or not a question will receive an answer within a certain time frame, rather than predicting a specific interval of time within which an answer should be received. The paper also introduces a new set of features that help developers better characterize the properties of questions.

Decoding Music in the Human Brain using EEG Data
Chris Foster, Dhanush Dharmaretnam, Haoyan Xu, Alona Fyshe, George Tzanetakis
IEEE 20th International Workshop on Multimedia Signal Processing
August 2018 - Vancouver, Canada
This research project utilizes representational similarity analysis to measure the relationship between music features

and the EEG data of subjects listening to the music. We show correlation between the mel spectrogram cepstral coefficients and tempogram features of the songs with the brain data of the subjects. We also use a simplified machine learning approach to achieve state-of-the-art classification of song titles from the EEG data on this dataset.

Decoding Word Semantics and Learning in EEG Data via an Artificial Language

Chris Foster, Chad C. Williams, Olave E. Krigolson, Alona Fyshe
Inaugural Conference on Cognitive Computational Neuroscience
September 2017 - New York, USA

This research project utilizes machine learning ridge regressors to predict word vector features based on input EEG data of a subject reading a word. The experiment is designed as a reinforcement learning paradigm, where the subject is viewing a series of symbols with a 1-to-1 mapping to an English word. As the subject learns the mappings we see word semantics begin to correlate to the brain's EEG readings as detected by a standard "2 vs. 2" test.

Response Time Predictions for Stack Overflow

Guojin Tang, Erwin Li, Chris Foster, Haytham El Miligi
12th Annual TRU Undergraduate Research and Innovation Conference
March 2017 - Kamloops, Canada

This research project surrounds the investigation of applications for machine learning algorithms on large web datasets. We explore the application of machine learning in the context of developer mailing list data and more modern communities such as StackOverflow and Github. We improve on the work of a paper which predicts response times to Stack Overflow questions and explore ideas for improving the accuracy and applying to alternative datasets.

Tracking Cattle with Infrared Imaging Drones

Chris Foster, Matthew McInnes, John Church, Kevin O'Neil
10th Annual Irving K. Barber School Undergraduate Research Conference
April 2015 - Kelowna, Canada

This research project surrounds the development and investigation of a prototype quadcopter automated drone that can fly over ranching fields and identify cattle with a high-quality infrared camera and our custom computer vision algorithm. By utilizing the onboard GPS, we can generate a list of coordinates for the rancher. This is magnitudes cheaper for ranchers than the traditional method.

Scholarships and Awards

President's Research Scholarship

September 2016 - $4,000
University of Victoria

University of Victoria Fellowship

September 2016 - $13,500 (Declined)
University of Victoria

Outstanding Graduate Entrance Award
September 2016 - $5,000
University of Victoria

Canada Graduate Scholarship Master's Award
September 2016 - $17,500
Natural Sciences and Engineering Research Council of Canada

TRU Alumni Association Award
November 2015 - $1,200
Thompson Rivers University

British Columbia District Award
November 2012 - $500
Government of British Columbia

BC Interior Community Foundation Award
October 2012 - $300
BC Interior Community Foundation

British Columbia Provincial Award
September 2012 - $1,000
Government of British Columbia

Relevant Volunteer Experience

Victoria Machine Learning Meetup
February 2019 - Present
Lead Organizer

TRUCS Support Lab
September 2015 - December 2015
Support Lab Volunteer

TRUSU Computer Science Club
November 2014 - June 2016
Board Member - President

TRUSU Computer Science Club
March 2014 - November 2014
Board Member - Vice President

TRUSU Computer Science Club
November 2013 - March 2014
Board Member - Events Coordinator

Startup Weekend Kamloops
June 2013 - July 2015
Assistant Organizer

Community Talks and Presentations

Deep Learning for Self Driving Cars
Presented at the Thompson Rivers University Data Science Seminar
February 2021

Component Driven Development with Storybook
Presented at Startup Slam 2019
September 2019

Deep Learning for Self Driving Cars
Presented at the Victoria Machine Learning Meetup
July 2019

A Short Intro to Reinforcement Learning
Presented at Polyglot Unconference 2019
May 2019

Introduction to Reinforcement Learning
Presented at the Victoria Machine Learning Meetup
February 2019

Decoding Semantics During an Artificial Language Learning Task Using EEG
Presented at the University of Victoria Cognition and Brain Sciences Seminar
September 2017

The Fundamentals of Neural Networks
Presented at the Victoria Machine Learning Meetup
May 2017

Deep Learning for Self Driving Cars
Presented at the University of Victoria Advanced Software Engineering Research Seminar
April 2017

Video Super Resolution with Deep Learning
Presented to the University of Victoria Computing Science department
April 2017

SwoopVR: A Web-based Mesh Viewer
Presented to Thompson Rivers University faculty
April 2016

Mining Stack Overflow
Presented to Thompson Rivers University faculty
April 2016

Introduction to Functional Programming
Presented to the TRUSU Computer Science Club
February 2016

Introduction to Automated Testing
Presented to the TRUSU Computer Science Club
November 2015

Tracking Cattle with Infrared Imaging
Presented to Thompson Rivers University faculty
May 2015

Introduction to Python
Presented to the TRUSU Computer Science Club
April 2015

Creating Zero-Knowledge SaaS Applications
Presented at the Okanagan Developers Group Meetup
October 2014

Introduction to Git
Presented to the TRUSU Computer Science Club
October 2014

Introduction to Cryptography
Presented to the TRUSU Computer Science Club
September 2014

Certifications and Courses

How to Manage a Remote Team
October 2020
Coursera / GitLab

AWS Certified Solutions Architect Associate
September 2017
Amazon Web Services

Standard First Aid & CPR
January 2015
Canadian Red Cross

MongoDB Developer Course Certification
December 2012
MongoDB Inc.

Machine Learning Course Certification
December 2011
Coursera / Stanford University

Research Interests

- Artificial intelligence, machine learning
- Privacy, applied cryptography, secure communications, and zero-knowledge services
- Software development, open source software, web technologies
- Security in mobile applications, web applications, and networks
- Practical applications of new types of software for fields other than computing science

Personal Achievements

- Placed 1st in the M:18-24 category for Oliver Half Iron 2018 Triathlon
- Placed 10th in the M:18-24 category for Ironman Santa Rosa 2017 Qualifier Triathlon
- Placed 1st in the M:20-24 category for Oliver Half Iron 2016 Triathlon
- Placed 2nd in the M:20-29 category for Kamloops Sprint Sprint 2016 Triathlon
- Placed 3rd in the M:20-29 category for Pavillion Sprint 2015 Triathlon
- Placed 1st in the M:20-29 category for Kamloops Sprint Sprint 2015 Triathlon
- Placed 3rd in the M:20-29 category for Pavillion Sprint 2014 Triathlon
- Placed 1st in the M:16-19 category for Pavillion Sprint 2013 Triathlon

Languages

English
Native Speaker

Esperanto
Elementary Proficiency

Spanish
Elementary Proficiency