

Brian de Silva

CONTACT INFORMATION	University of Washington Department of Applied Mathematics 202 Lewis Hall UW Box 353925 Seattle, Washington 98195-3925	bdesilva@uw.edu https://briandesilva.github.io/ https://github.com/briandesilva
RESEARCH INTERESTS	Machine learning, scientific computing, reduced order modeling, and numerical analysis	
EDUCATION	University of Washington Ph.D. candidate, Applied Mathematics (expected spring 2020) <ul style="list-style-type: none">• Advisor: J. Nathan Kutz• GPA: 3.9• Advanced Data Science Option M.S. in Applied Mathematics, December 2015 University of California at Los Angeles B.S. in Applied Mathematics, December 2013 <ul style="list-style-type: none">• Specialization in computing	
PUBLICATIONS	<input type="checkbox"/> de Silva, Brian, et al. <i>Discovery of Physics from Data: Universal Laws and Discrepancy Models</i> . <i>arXiv preprint arXiv:1906.07906</i> (2019). <input type="checkbox"/> de Silva, Brian and Ryan Compton. Prediction of Foreign Box Office Revenues Based on Wikipedia Page Activity. <i>arXiv preprint arXiv:1405.5924</i> (2014). <input type="checkbox"/> Maria-Grazia Ascenzi, et al. Automated Cell Detection and Morphometry on Growth Plate Images of Mouse Bone. <i>Applied Mathematics, Special issue on Mathematical modeling and experimentation, 5.18</i> (2014): 2866.	
DATA SCIENCE PROJECTS	<input type="checkbox"/> <i>Detecting scam pages</i> : Deployed three image-retrieval based models and trained a multi-channel page embedding for scam page detection. Tools used: K-nearest neighbors, proprietary retrieval methods, nonlinear embeddings, convolutional neural networks, and feedforward networks. <input type="checkbox"/> <i>Studying approaches for utilizing cross-domain data</i> : Investigated different methods of incorporating cross-domain features into in-domain models. Tools used: Sparse neural networks, two-tower sparse neural networks. <input type="checkbox"/> <i>Clustering documents using nonnegative matrix factorization</i> : Classified text files based on their thematic content. Tools used: Nonnegative matrix factorization and K-means. See the project section of my AMath582 github repository. <input type="checkbox"/> <i>Using recurrent neural networks to generate haiku</i> : Compared the performance of recurrent neural networks against LSTMs on the task of generating haiku. The training data consisted of a set of “artificial” haiku (sentences not intended to be haiku, but which had the syllabic structure of a haiku) which we extracted from a large set of text documents. Tools used: RNNs and LSTMs. <input type="checkbox"/> <i>Financial fraud detection</i> : Utilized cost-sensitive algorithms to detect fraudulent transactions in a Kaggle data set. Tools used: cost-sensitive versions of logistic regression, decision tree, and random forest. See the project section of my CSE_547_ML_For_Big_Data github repository.	

GRADUATE COURSEWORK	<input type="checkbox"/> Machine Learning <input type="checkbox"/> Data Visualization <input type="checkbox"/> Numerical Optimization <input type="checkbox"/> Numerical Solution of Differential Equations <input type="checkbox"/> Approximation Theory & Spectral Methods	<input type="checkbox"/> Machine Learning For Big Data <input type="checkbox"/> Data Analysis <input type="checkbox"/> Statistics <input type="checkbox"/> Numerical Linear Algebra <input type="checkbox"/> Numerical Analysis
HONORS AND AWARDS	2019 Finalist in the Terminal Live, UW coding competition 2017 Boeing Award for Excellence in Service 2015 Joseph Hammack Endowment Award for Outstanding Work in Applied Mathematics	
SCIENTIFIC RESEARCH EXPERIENCE	Summer 2019 Software Engineer Internship Facebook, Seattle, WA Machine learning Embeddings, Image Retrieval Summer 2018 Software Engineer Internship Facebook, Seattle, WA Machine learning Sparse Neural Networks, Embeddings 2013–2014 Information and Systems Sciences Internship HRL Laboratories, Malibu, CA Social and Information Networks Social modeling, Data collection Summer 2013 Applied Mathematics Research Experience for Undergraduates UCLA, Los Angeles, CA Social Networks and Large Data Sets Topic Modeling, Nonnegative Matrix Factorization	
PROGRAMMING LANGUAGES	C++ Four years, used for numerical methods and scientific computing MATLAB Six years, used for numerical methods and scientific computing Python Four years, used for machine learning and numerical methods Mathematica Two years, used for symbolic calculations and visualization SQL Six months, used throughout machine learning internships TensorFlow Three months, used for machine learning research	
TEACHING EXPERIENCE	Autumn 2018 Instructor, <i>Introduction to Differential Equations and Applications</i> Summer 2017 Instructor, <i>Introduction to Differential Equations and Applications</i> Spring 2017 TA, <i>Graduate Numerical Analysis of Time Dependent Problems</i> Winter 2017 Instructor, <i>Numerical Linear Algebra and Numerical Analysis</i> Autumn 2016 TA, <i>Graduate Vector Calculus and Complex Variables</i> Summer 2016 Instructor, <i>Numerical Linear Algebra and Numerical Analysis</i> Spring 2016 TA, <i>Calculus III</i> Winter 2016 TA, <i>Calculus II</i> Autumn 2015 TA, <i>Beginning Scientific Computing</i> Spring 2015 TA, <i>Beginning Scientific Computing</i> Winter 2015 TA, <i>Calculus I</i> Autumn 2014 TA, <i>Calculus I</i>	
EXTRA-CURRICULARS	2017–Present Member of Applied Math Diversity Committee 2015–2018 Principal organizer for the Numerical Analysis Research Club 2017–2018 Member of Applied Math Teaching Club 2016–2017 Graduate Student Representative of Applied Math Department 2015–2016 Vice President of the UW SIAM student chapter	