Colby Ford

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EDUCATION

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

Doctor of Philosophy
Computing & Information Systems - Bioinformatics & Computational Biology
Wayland H. Cato Doctoral Fellow

Master of Science
Data Science & Business Analytics
First Graduate of the Program

Bachelor of Arts
Applied Mathematics
Minor: Psychology
Coffey Foundation Scholar
C.L. Robbins Scholar

CALDWELL COMMUNITY COLLEGE & TECHNICAL INSTITUTE

Associate in Science
Associate in Arts

LINKS

Github:// colbyford
LinkedIn:// colbyford
Research Gate:// colby_ford
Google Scholar:// Colby T. Ford

SKILLS

PROGRAMMING

Languages:
R • Python • SQL • Scala
Perl • SAS • Visual Basic
Parallel Computing:
Spark • Hadoop • MPI • SNOW
Markup/Design:
HTML5 • CSS3 • LaTeX

OCCUPATIONAL EXPERIENCE

UNC CHARLOTTE | Bioinformatics Researcher & Teaching Faculty

November 2018 - Present | Charlotte, NC

- Completed research in a broad range of fields including infectious diseases, epistasis, and human phylogenetics.
- Teaching *Cloud Computing for Data Analysis* (DSBA 6190) for the Data Science Initiative Master's program. Received a funding grant from Microsoft to modernize and rebuild the course content on the Azure cloud platform.

BLUEGRANITE | Senior Data Scientist, AI Solution Architect

January 2017 - Present | Charlotte, NC

- Develop data and AI solutions using the Microsoft Azure platform using products such as Microsoft ML Server, Microsoft Azure Machine Learning, Cognitive Services, HDInsight (Hadoop), and Azure Databricks (Apache Spark).
- Manage client engagements including requirements gathering, project planning, and budgeting.
- Host training workshops, give conference presentations and demonstrations on Microsoft advanced analytics technologies.

LASH GROUP | Senior Data Science Lead

February 2016 - February 2017 | Fort Mill, SC

- Develop machine learning experiments and data analysis workflows to aid in client analytics.
- Discover, understand, and present insights into patient drug adherence.
- Consult in company data architecture including master data management and governance for future business strategy to grow value for client accounts.

MARINER | Data Scientist

October 2014 – February 2016 | Charlotte, NC

- Consult in the development of machine learning experiments, including parametric and non-parametric models, statistical predictions, and data mining.
- Build Azure cloud-based solutions for data collection, processing, and storage using Microsoft Azure Technologies such as Data Science Virtual Machines, Machine Learning Studio, Azure SQL Database, and more.
- Design and create interactive visualizations for both dashboarding and reporting using Microsoft PowerBI, Tableau Desktop & Tableau Server.

NORTH CAROLINA NEW SCHOOLS | Technology Facilitator & Mathematics Instructional Assistant

April 2014 – October 2014 | Hudson, NC

- Responsible for entire technology inventory: ordering, maintenance, management, etc. and maintained school website.
- Liaison between college & high school technology departments.
- Taught NCVPS mathematics courses, held additional teaching sessions in math and science and SAT & ACT preparation.

COURSEWORK

DOCTORAL

Bioinformatics Programming - Perl
Molecular Sequence Analysis
Bioinformatics Programming - Python
Energy and Interaction
Research Rotation I
Research Rotation II
Drugs: Molecular & Cell Mechanics
Computational Structural Biology
Statistics for Bioinformatics

MASTERS

Database Systems
Visual Analytics
Big Data Analytics
Business Intelligence
Database Design & Management
Consumer Marketing Analytics
Innovation Analytics
Advanced Business Analytics
Machine Learning
Data Warehousing

UNDERGRADUATE

Mathematical Dataset Modeling
Mathematical Thought
Applied Regression
Financial Mathematics
Regression Analysis
Industrial & Organizational Psychology
Deductive Logic
Deterministic Modeling
Cognitive Science - Perception
Business Programming - Visual Basic

RESEARCH

PUBLICATIONS

- Schneider A.B., **Ford, C.T.**., Williams, J., Cioce, M., Çatalyürek, U., Wertheim, J., Janies D., (2019) (*Coming Soon*) *StrainHub*: A phylogenetic tool to construct pathogen transmission networks
- **Ford, C.T.**., Smith, K., Zenarosa, G.L., Williams, J., Janies D., (2019) (*Coming Soon*) Persistence of Antimicrobial Resistance Genes Demonstrates Genetic Capitalism in *Escherichia coli*
- Zenarosa, G.L., **Ford, C.T.**., Brown, D., Smith, K., Janies D., (2019) (*Coming Soon*) Multidrug Resistance Genes Associated with Colisitin Resistance in *Escherichia coli*
- **Ford, C.T.**, Wen, J., Janies, D., Shi, X., (2019) (*Coming Soon*) parEBEN: A Parallelized Strategy for Improving Epistasis Analysis Based on Empirical Bayesian Elastic Net Models
- Smith, K., Zenarosa, G., **Ford, C**., Williams, J., Janies D., (2019) (*National Council on Undergraduate Research - Conference*) Phylogenetic Analysis of the Genetic Variation of Multi-Drug Resistant *Escherichia coli*
- **Ford, C.T**., Nodzak, C.M., Uppal, A., Shi, X., (2019) (*BioRxiv*) Prediction of the Effect of Naturally Occurring Missense Mutations on Cellular N-Acetyl-Glucosaminidase Enzymatic Activity. https://doi.org/10.1101/598870
- Wen J., **Ford, C.**, Janies D., Shi X., (2018) (*ACM Conference on Bioinformatics, Computational Biology, and Health Informatics*) New strategies toward scaling up epistasis analysis on large-scale genomic datasets
- **Ford, C. T.** (2018). An integrated phylogeographic assessment of the Bantu migration. (Order No. 10748780, The University of North Carolina at Charlotte). *ProQuest Dissertations and Theses*, 120.
- **Ford, C.** & Lathrop, A. (2017). (*Presentation - Analytics for Social Good, University of Cincinnati.*) Predictive modeling of vegetation density using R and a cloud data platform.
- Janies, D.A., **Ford, C.,** Damodaran, L., Witter, Z., (2016) (*Online Journal of Public Health Informatics*) Spread of Middle East Respiratory Coronavirus: Genetic versus Epidemiological Data https://doi.org/10.5210/ojphi.v9i1.7581
- **Ford, C**., Xue, M., Whiteley, P.M., Wheeler, W., Janies, D.A., Shi, X. (2016) *(Society for Anthropological Sciences)* Visualizing Linguistic Disparity of Uto-Aztecan Languages and Bantu Languages

OTHER WORK

- **Ford, C.** (2015). Demand forecasting using machine learning to reduce working capital. *Mariner White Paper.*
- **Ford, C.** (2015). The allure of machine learning, now within reach in Microsoft Azure. *Mariner White Paper.*
- **Ford, C.**, & Snyder, W. (2015). Revenue protection using machine learning for utilities management. *Mariner White Paper.*
- **Ford, C.**, (2016). Assessment of retail out-of-stock conditions using statistical inference. *Mariner White Paper.*
- Blog Posts Written for BlueGranite

TEACHING

Cloud Computing
Advanced Functions & Modeling
Discrete Mathematics
Precalculus
Machine Learning
SAT/ACT Prep

TRAINING

Microsoft ML Server
Azure Databricks
Microsoft Power BI
Tableau

RESEARCH

JANIES LAB | Disease Transmission Research

August 2015 – Present | Charlotte, NC

Working with **Dr. Dan Janies** to analyze the disease transmission patterns of pathogens. Some examples include antimicrobial resistance of *E. coli*, pathogenicity changes in *P. vivax*, and the Middle Eastern Respiratory Syndrome coronavirus.

DARPA | Bantu Migration - Genomics and Language Research

November 2015 – May 2018 | Charlotte, NC

Worked with researchers from DARPA, The American Museum of Natural History (**Drs. Ward Wheeler** and **Peter Whitley**), and The University of North Carolina at Charlotte (**Drs. Dan Janies** and **Xinghua (Mindy) Shi**) to understand the genetic, geographic, and linguistic relationship between languages in both Bantoid and Uto-Aztecan groups.

SHI LAB | Parallel Computing for Epistasis Detection

May 2018 – March 2019 | Charlotte, NC

Worked with **Drs. Xinghua (Mindy) Shi** and **Jia Wen** in the Shi Lab in epistasis research. We developed the parEBEN package as a parallel approach of the empirical Bayesian elastic net for detecting gene-gene interaction.

PROFESSIONAL MEMBERSHIPS

2013-Present	The Society for Industrial and Applied Mathematics
2014-Present	The American Statistical Association
2015-2017	UNCC Data Science Initiative Advisory Board
2015-2016	Northeastern University LEVEL Board Member and Lecturer
2016-2017	The Society for Anthropological Sciences
2018-Present	American Association for the Advancement of Science

CONFERENCE ATTENDANCES

Nov. 2014	Microsoft Roadmap Event (*Speaker*)	Charlotte, NC
Sep. 2015	Microsoft Cortana Analytics Conference	Seattle, WA
Sep. 2016	Advanced Pharma Analytics	Newark, NJ
Feb. 2017	Analytics for Social Good - U. Cincinnati (*Speaker*)	Cincinatti, OH
Mar. 2017	Society for Applied Anthropology (*Speaker*)	Santa Fe, NM
Nov. 2017	Nissan Analytics Expo (*Speaker*)	Nashville, TN
Jan. 2018	rstudio::conf 2018	San Diego, CA
Jun. 2018	Spark+AI Summit 2018	San Francisco, CA
Sep. 2018	Big Data Ignite (*Speaker*)	Grand Rapids, MI
Sep. 2018	Microsoft Ignite	Orlando, FL
Jan. 2019	rstudio::conf 2019	Austin, TX
Mar. 2019	Microsoft Azure AI Hackfest	New York, NY

CERTIFICATIONS

May 2018 Databricks Certified Developer - Apache Spark 2.x for Python

FUNDING

Jan. 2019 Azure Funding for Cloud Computing Course $30,000