

# Colby T. Ford, Ph.D.

*Computational Biologist, Data Scientist,  
Cloud AI & Genomics Architect*

Phone: (828) 773-8009  
Academic Email: colby.ford@uncc.edu  
Consulting Email: colby@tuple.xyz  
Location: Charlotte, NC  
Website: colbyford.com

LinkedIn: colbyford  
GitHub: colbyford  
ORCID: 0000-0002-7859-3622  
Google Scholar: zetDB4EAAAAJ  
Google Presence: 11dXPqljsq  
NPPES NPI: 1255002408  
Microsoft MVP: 5005240

## Education

### *The University of North Carolina at Charlotte*

2018 Doctor of Philosophy in Bioinformatics and Computational Biology  
*Advisor: Daniel Janies, Ph.D.*  
*Wayland H. Cato Doctoral Fellow*

2015 Master of Science in Data Science and Business Analytics  
*Advisor: Mirsad Hadžikadić, Ph.D.*

2014 Bachelor of Arts in Applied Mathematics, Concentration in Statistics  
*Advisor: Mary Kim Harris, Ed.D.*  
*Coffey Scholar, C.L. Robbins Scholar*

## Industry Positions

### *Tuple (a Microsoft Partner)*

Founded the only Microsoft and Databricks partner firm specializing in scalable cloud -omics solutions. Tuple provides data architecture and research consulting services in Azure, focusing on cloud AI in the life sciences. Co-wrote the Azure Data Scientist Microsoft Certified Solution Associate exam (DP-100) and the MS Learn Azure Data Scientist exam. Created the azbasespace connector for Illumina BaseSpace to Azure and the ahab system for -omics in Kubernetes. Microsoft Partner-of-the-Year nominee for 2023.

August 2019 - Present Founder & Principal Consultant

### *Amissa*

Co-founded Amissa, a digital health company that's using cloud-based AI and analytics with wearable devices to help in the fight against Alzheimer's disease. Designed and built the Sinuo platform, which applies state-of-the-art artificial intelligence techniques to sensory data, biomarkers, and additional patient metrics. Amissa's work has been funded by the NIH's National Institute for Aging and the NSF's I-Corps program.

March 2020 - Present Co-Founder & VP of Technology

*Pfizer (formerly Seagen)*

Established a scalable cloud computing architecture on Azure to support the Translational Sciences group in the discovery of therapeutic targets for antibody development in oncology. This includes an automated, Kubernetes-based workflow for scalable RNA-seq, WES, protein docking, and pharmacodynamics pipelines along with supporting GxP-qualified data platform, data lake, and machine learning architecture. Collaborated with Research to design scalable, cloud-based protein structural analyses for antibody candidates against tumor targets. Productionalized drug sensitivity ML models using gene expression data.

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|--------------------------------|--|
| December 2023 - Present        | Mgr. ML & Cloud Engineering, Bioinformatics, Pfizer Oncology |
| September 2021 - December 2023 | Mgr. ML & Cloud Engineering, Bioinformatics, Seagen          |
| March 2021 - September 2021    | Sr. Scientist, Bioinformatics, Seagen                        |

*BlueGranite (a Microsoft Partner)*

Developed data platform and AI solutions using the Microsoft Azure cloud with services such as Azure Machine Learning, Cognitive Services, and Databricks (Apache Spark). Hosted many training workshops and gave conference presentations and demonstrations on Microsoft advanced analytics technologies. Started and led the genomics practice, building scalable solutions for bioinformatics analyses in Azure. (Acquired by 3Cloud LLC.)

|                               |   |
|-------------------------------|---|
| May 2020 - October 2021       | Principal Architect, Life Sciences          |
| December 2020 - May 2020      | Genomics Practice Lead                      |
| December 2020 - May 2020      | AI Practice Lead (Interim)                  |
| November 2018 - December 2020 | Solution Architect, Artificial Intelligence |
| January 2017 - November 2018  | Senior Data Scientist                       |

*Edge Systems - The HydraFacial Company*

Lead the data science and cloud infrastructure team through research and development initiatives related to IoT medical device informatics. Responsible for innovation with product marketing and engineering to improve and enhance technology products and processes. Implemented computer vision capabilities on the HydraFacial skin analyzer device for detection and classification of dermatologic conditions. (NASDAQ IPO: SKIN, now called Beauty Health Co.)

|                        |                          |
|------------------------|--------------------------|
| July 2019 - March 2020 | Director of Data Science |
|------------------------|--------------------------|

*Ember.AI*

Developed a custom artificial intelligence engine for building state-of-the-art natural language processing models for fraud and compliance-related use cases. Built a large-scale, massively parallel processing architecture using Amazon Web Services and Databricks (Apache Spark) for interactive model training. (Acquired by Barrick Gold Corp.)

|                          |                      |
|--------------------------|----------------------|
| August 2018 - March 2020 | Chief Data Scientist |
|--------------------------|----------------------|

*AmerisourceBergen*

Developed machine learning experiments and data analysis workflows to aid in pharmaceutical client analytics. Created analysis pipelines for the discovery and understanding into patient drug adherence and rare disease drug access. Consulted in company data architecture including master data management and governance for future business strategy to grow value for client accounts. (Now called Cencora.)

|                               |                                      |
|-------------------------------|--------------------------------------|
| February 2016 - February 2017 | Senior Data Science Lead, Lash Group |
|-------------------------------|--------------------------------------|

*Mariner (a Microsoft Partner)*

Consulted in the development of machine learning experiments, including parametric and non-parametric models, statistical predictions, and data mining. Built 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. Designed and created interactive visualizations for both dashboarding and reporting using Microsoft Power BI, Tableau Desktop & Tableau Server.

October 2014 - February 2016 Data Scientist

*Caldwell Hospice and Palliative Care*

Pioneered the transition from hand-written, paper medical forms to electronic data input and served as a database administrator. Worked closely with HIPAA and Medicare/Medicaid guidelines for data compliance.

August 2008 - December 2011 Medical Records Database Administrator

**Academic Positions***The University of North Carolina at Charlotte*

Redesigned and taught *Cloud Computing for Data Analysis* (DSBA 6190) for the School of Data Science Master's program. Received a funding grant from Microsoft to modernize and rebuild the course content on the Azure cloud platform. Performing research in a broad range of fields in the bioinformatics and computational biology space including infectious diseases, epistasis, human genomics, and phylogenetics.

|                             |                             |                                      |
|-----------------------------|-----------------------------|--------------------------------------|
| September 2023 - Present    | Visiting Scholar            | CIPHER Research Center               |
| November 2021 - August 2023 | Associate Faculty           | School of Data Science               |
| July 2021 - Present         | University Business Partner | Research and Economic Development    |
| January 2021 - May 2021     | Public Health Researcher    | Dept. of Public Health               |
| January 2019 - July 2021    | Bioinformatics Researcher   | Dept. of Bioinformatics and Genomics |
| January 2019 - May 2021     | Associate Faculty           | School of Data Science               |
| April 2018 - December 2018  | Postdoctoral Researcher     | Dept. of Bioinformatics and Genomics |
| May 2016 - April 2018       | Research Assistant          | Dept. of Bioinformatics and Genomics |

*Northeastern University*

Taught a summer session of machine learning to graduate students in the LEVEL analytics program.

May 2015 - August 2015 Guest Lecturer Dept. of Business and Analytics

*North Carolina New Schools*

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

|                           |                                     |                        |
|---------------------------|-------------------------------------|------------------------|
| April 2014 - October 2014 | Technology Facilitator              | Caldwell Early College |
| April 2014 - October 2014 | Mathematics Instructional Assistant | Caldwell Early College |

## Publications

### Peer-Reviewed Journal Articles

- J19. Tara N. McCray, Vy Nguyen, Jake S. Heins, Elizabeth Nguyen Ngyuen, Kristen Stewart, **Colby T. Ford**, Alejandro Rizo, Calvin Neace Neace, Priyanka Gupta, and David J. Ortiz. Airway Organoids: A Preclinical Tool to Screen Toxicity Associated with Antibody-Drug Conjugates. (*In Press*), 2023
- J18. The Critical Assessment of Genome Interpretation Consortium. CAGI, the Critical Assessment of Genome Interpretation, establishes progress and prospects for computational genetic variant interpretation methods. *Genome Biology (In Press)*, 2023
- J17. Cristian M. Galván-Villa, Francisco A. Solís-Marín, Karen Lopez, Janessa Cobb, Leopoldo Díaz-Pérez, Carlos R. Rezende-Ventura, Nataly Slivak, **Colby T. Ford**, and Daniel A. Janies. Occurrence of the Indo-West Pacific starfish *Luidia magnifica* (Echinodermata: Asteroidea) in the Mexican Pacific and a possible introduction to the Caribbean region. *Marine Biodiversity*, 54(1):1, Dec 2023
- J16. Daniel Kepple, **Colby T. Ford**, Jonathan Williams, Beka Abagero, Shaoyu Li, Jean Popovici, Delenasaw Yewhalaw, and Eugenia Lo. Comparative transcriptomics reveal differential gene expression in *Plasmodium vivax* geographical isolates and implications on erythrocyte invasion mechanisms. *PLOS Neglected Tropical Diseases (In Press)*, 2023
- J15. Hsin Lee, Kwen-Shen Lee, Chia-Hsin Hsu, Chen-Wei Lee, Ching-En Li, Jia-Kang Wang, Chien-Chia Tseng, Wei-Jen Chen, Ching-Chang Horng, **Colby T. Ford**, Andreas Kroh, Omri Bronstein, Hayate Tanaka, Tatsuo Oji, Jih-Pai Lin, and Daniel Janies. Phylogeny, ancestral ranges and reclassification of sand dollars. *Scientific Reports*, 13(1):10199, Jun 2023
- J14. **Colby T. Ford**, Shirish Yasa, Denis Jacob Machado, Richard Allen White III, and Daniel A. Janies. Predicting changes in neutralizing antibody activity for SARS-CoV-2 XBB.1.5 using in silico protein modeling. *Frontiers in Virology*, 3, 2023
- J13. **Colby T. Ford**, Cheikh Cambel Dieng, Anita Lerch, Dickson Doniou, Kovidh Vegesna, Daniel Janies, Liwang Cui, Linda Amoah, Yaw Afrane, and Eugenia Lo. Genetic variations of *Plasmodium falciparum* circumsporozoite protein and the impact on interactions with human immunoproteins and malaria vaccine efficacy. *Infection, Genetics and Evolution*, 2023
- J12. Dorcas Bredu, George K. Ahadzi, Donu Dickson, Sherik-fa Anang, Alexander Asamoah, George Asumah, Nana Prepah, Dorcas Obiri Yeboah, **Colby T. Ford**, Eugenia Lo, Keziah Laurencia Malm, and Linda Eva Amoah. Nationwide surveillance of Pfhrp2 exon 2 diversity in *Plasmodium falciparum* circulating in symptomatic malaria patients living in Ghana. *American Journal of Tropical Medicine and Hygiene.*, 2022
- J11. **Colby T. Ford**, Denis Jacob Machado, and Daniel A Janies. Predictions of the SARS-CoV-2 Omicron Variant (B.1.1.529) Spike Protein Receptor-Binding Domain Structure and Neutralizing Antibody Interactions. *Frontiers in Virology*, 2022
- J10. Anthony Ford, Daniel Kepple, Jonathan Williams, Gabrielle Kolesar, **Colby T. Ford**, Abnet Abebe, Lemu Golassa, Daniel A. Janies, Delenasaw Yewhalaw, and Eugenia Lo. Gene Polymorphisms Among *Plasmodium vivax* Geographical Isolates and the Potential as New Biomarkers for Gametocyte Detection. *Frontiers in Cellular and Infection Microbiology*, 11, 2022
- J9. **Colby T. Ford**, Gezahegn Solomon Alemayehu, Kayla Blackburn, Karen Lopez, Cheikh Cambel Dieng, Lemu Golassa, Eugenia Lo, and Daniel Janies. Modeling *Plasmodium falciparum* Diagnostic Test Sensitivity Using Machine Learning With Histidine-Rich Protein 2 Variants. *Frontiers in Tropical Diseases*, 2:28, 2021
- J8. Anthony Ford, Daniel Kepple, Beka Raya Abagero, Jordan Connors, Richard Pearson, Sarah Auburn, Sisay Getachew, **Colby T. Ford**, Karthigayan Gunalan, Louis H. Miller, Daniel A. Janies, Julian C. Rayner, Guiyun Yan, Delenasaw Yewhalaw, and Eugenia Lo. Whole genome sequencing of *Plasmodium vivax* isolates reveals frequent sequence and structural polymorphisms in erythrocyte binding genes. *PLOS Neglected Tropical Diseases*, 14(10):1–27, 10 2020

- J7. **Colby T. Ford**, Gabriel Lopez Zenarosa, Kevin B. Smith, David C. Brown, John Williams, and Daniel Janies. Genetic Capitalism and Stabilizing Selection of Antimicrobial Resistance Genotypes in *Escherichia coli*. *Cladistics*, 2020
- J6. **Colby T. Ford**, Jia Wen, Daniel Janies, and Xinghua Shi. A Parallelized Strategy for Epistasis Analysis Based on Empirical Bayesian Elastic Net Models. *Bioinformatics*, 03 2020. btaa216
- J5. **Colby T. Ford** and Daniel Janies. Ensemble machine learning modeling for the prediction of artemisinin resistance in malaria. *F1000Research*, 9(62), 2020
- J4. Adriano de Bernardi Schneider, **Colby T. Ford**, Reilly Hostager, John Williams, Michael Cioce, Ümit V. Catalyürek, Joel O Wertheim, and Daniel Janies. StrainHub: A phylogenetic tool to construct pathogen transmission networks. *Bioinformatics*, 08 2019
- J3. Wyatt T. Clark, Laura Kasak, Constantina Bakolitsa, Zhiqiang Hu, Gaia Andreoletti, Giulia Babbi, Yana Bromberg, Rita Casadio, Roland Dunbrack, Lukas Folkman, **Colby T. Ford**, David Jones, Panagiotis Katsonis, Kunal Kundu, Olivier Lichtarge, Pier L. Martelli, Sean D. Mooney, Conor Nodzak, Lipika R. Pal, Predrag Radivojac, Castrense Savojardo, Xinghua Shi, Yaoqi Zhou, Aneeta Uppal, Qifang Xu, Yizhou Yin, Vikas Pejaver, Meng Wang, Liping Wei, John Moulton, Guoying Karen Yu, Steven E. Brenner, and Jonathan H. LeBowitz. Assessment of predicted enzymatic activity of  $\alpha$ -N-acetylglucosaminidase variants of unknown significance for CAGI 2016. *Human Mutation*, 40(9):1519-1529, 2019
- J2. **Colby T. Ford**. An integrated phylogeographic analysis of the Bantu migration. *ProQuest Dissertations and Theses*, page 120, 2018
- J1. Daniel Janies, **Colby Ford**, Lambodhar Damodaran, and Zachary Faigen. Spread of Middle East Respiratory Coronavirus: Genetic versus epidemiological data. *Online Journal of Public Health Informatics*, 9(1), 2017

### Preprints

- P5. **Colby T. Ford**, Phillip J. Tomezsko, Avery E. Meyer, Adam M. Michaleas, and Rafael Jaimes III. Human cytokine and coronavirus nucleocapsid protein interactivity using large-scale virtual screens. *bioRxiv*, 2023
- P4. Shirish R. Yasa, Sayal Guirales-Medrano, Denis Jacob Machado, **Colby T. Ford**, and Daniel A. Janies. Predicting Antibody and ACE2 Affinity for SARS-CoV-2 BA.2.86 with *In Silico* Protein Modeling and Docking. *bioRxiv*, 2023
- P3. Nicholas J. Santistevan, **Colby T. Ford**, Cole S. Gilsdorf, and Yevgenya T. Grinblat. Behavioral and transcriptomic analyses of mec2 function in zebrafish. *bioRxiv*, 2023
- P2. **Colby T. Ford**, Rachel Scott, Denis Jacob Machado, and Daniel Janies. Sequencing Data of North American SARS-CoV-2 Isolates Shows Widespread Complex Variants. *medRxiv*, 2021
- P1. **Colby T. Ford**, Aneeta Uppal, Conor M. Nodzak, and Xinghua Shi. Prediction of the effect of naturally occurring missense mutations on cellular N-acetyl-glucosaminidase enzymatic activity. *bioRxiv*, 2019

### Conference Papers and Presentations

- C10. **Colby T. Ford**, Eh So Wah, Jake Pfaffenroth, Fidel Henriquez, and Jon Corkey. Scaling Digital Biomarker Discovery with the Cloud and Wearable Devices. *Alzheimer's Association International Conference*, 2023
- C9. Kira Chiles, Candace S. Brown, and **Colby T. Ford**. The effects of exercise during a pandemic. *UNC Charlotte Undergraduate Research Conference*, 2023
- C8. Adriano de Bernardi Schneider, **Colby T. Ford**, Jakob McBroome<sup>1</sup>, Jennifer Martin, Daniel Janies, Yatish Turakhia, and Russel Corbett-Detig. Understanding the spread of SARS-CoV-2 clusters through an integrated pipeline using UShER, Cluster Tracker and StrainHub. *Genetics Society of America - Population, Evolutionary, and Quantitative Genetics Conference*, 2022

- C7. Cheikh Cambel Dieng, **Colby T. Ford**, Dickson Doniou, Jennifer Huynh, Lerch Anita, Daniel Janies, Linda Amoah, Yaw Afrane, and Eugenia Lo. Population structure and selection-mediated changes in *Plasmodium falciparum* by next-generation sequencing. *Annual Meeting of the American Society of Tropical Medicine and Hygiene*, 2020
- C6. **Colby T. Ford**. Visualizing transmission networks of pathogens using phylogenetic data with StrainHub. *I Meeting of Systematics, Biogeography, and Evolution - Symposium of Virology in the SARS-CoV-2 era*, 2020
- C5. Daniel Janies, **Colby T. Ford**, Kevin Smith, Gabriel Lopez Zenarosa, and John Williams. Evolution of gain and loss of antimicrobial resistance genes in *Escherichia coli*. *XXXVIII Annual Meeting of the Willi Hennig Society*, 2019
- C4. Kevin Smith, **Colby T. Ford**, Gabriel Lopez Zenarosa, John Williams, and Daniel Janies. Phylogenetic analysis of the genetic variation of multi-drug resistant *Escherichia coli*. *National Council on Undergraduate Research*, 2019
- C3. Jia Wen, **Colby T. Ford**, Daniel Janies, and Xinghua Shi. New strategies toward scaling up epistasis analysis on large-scale genomic datasets. *ACM Conference on Bioinformatics, Computational Biology, and Health Informatics*, 2018
- C2. **Colby T. Ford** and Andy Lathrop. Predictive modeling of vegetation density using R and a cloud data platform. *Analytics for Social Good, University of Cincinnati*, 2017
- C1. **Colby T. Ford**, Ming Xue, Peter M. Whiteley, Ward Wheeler, Daniel A. Janies, and Xinghua Shi. Visualizing linguistic disparity of Uto-Aztecan languages and Bantu languages. *Society for Anthropological Sciences Annual Meeting*, 2016

### Software and Coding

- S3. **Colby T. Ford**. *msgen* - R functions for interfacing with the Microsoft Genomics service in Azure, January 2021
- S2. Adriano de Bernardi Schneider, **Colby T. Ford**, Reilly Hostager, John Williams, Michael Cioce, Ümit V. Catalyürek, Joel O Wertheim, and Daniel Janies. StrainHub: A phylogenetic tool to construct pathogen transmission networks. *Bioinformatics*, 08 2019
- S1. **Colby T. Ford**, Jia Wen, Daniel Janies, and Xinghua Shi. A Parallelized Strategy for Epistasis Analysis Based on Empirical Bayesian Elastic Net Models. *Bioinformatics*, 03 2020. btaa216

### Books and Chapters

- B2. **Colby T. Ford**. *Genomics in the Azure Cloud*. O'Reilly Media, Dec 2022. ISBN: 978-1-098-13904-9
- E2. **Colby T. Ford** and Larry Baker. *Building a Genomics Data Lake in Azure*. BlueGranite, Jan 2021. URL: <https://zenodo.org/record/4474520>, DOI: 10.5281/zenodo.4474520
- C1. Cheikh Cambel Dieng, **Colby T. Ford**, Jennifer Huynh, Linda E. Amoah, Yaw A. Afrane, Daniel A. Janies, and Eugenia Lo. Progress in *Plasmodium* genomics and current challenges in malaria control. In *Current Topics and Emerging Issues in Malaria Elimination*. IntechOpen, London, 2021. In Progress. ISBNs: 978-1-83968-484-5, 978-1-83968-483-8, DOI: 10.5772/intechopen.96530
- E1. **Colby T. Ford**. *Sparkitecture - A collection of "cookbook-style" scripts for simplifying data engineering and machine learning in Apache Spark*. GitBook, October 2019
- B1. **Colby Ford**. *Caesura - late-intermediate piano technique book*. Lulu, March 2010. ISBN: 978-0-557-36832-7

*Technical Articles*

- TA28. **Colby T. Ford.** Exploring AI-Based Protein Sequence Generation with EvoDiff from Microsoft Research, October 2023. Medium
- TA27. **Colby T. Ford.** GPT on my Genome: Building a QnA System for Genomic Variants with Azure OpenAI, September 2023. Medium
- TA26. **Colby T. Ford.** 4 Tips for Qualifying your Azure Data Lake for GxP use in the Life Sciences, August 2023. Medium
- TA25. **Colby T. Ford.** Predicting the molecular interactions of lecanemab, the new FDA-approved monoclonal antibody for Alzheimer's disease., July 2023. Medium
- TA24. **Colby T. Ford.** The Future of Manufacturing is Bio: Things I Learned in the Millyard., June 2023. Medium
- TA23. **Colby T. Ford.** How Azure OneLake will revolutionize the way we manage and use -omics data, May 2023. Medium
- TA23. **Colby T. Ford.** Deploying Databricks Dolly as an API on Azure Functions, April 2023. Medium
- TA22. **Colby T. Ford.** Deploying Azure OpenAI and Building a Custom Science Article Recommender App with ChatGPT, March 2023. Medium
- TA21. **Colby T. Ford.** What does ChatGPT think about using the Azure cloud for genomics?, January 2023. Medium
- TA20. **Colby T. Ford.** 5 Quick Things You Didn't Know About the Microsoft Cloud for Healthcare, November 2022. Medium
- TA19. **Colby T. Ford.** How to Deploy Shiny Apps in Azure and use your Domain Name, October 2022. Medium
- TA18. **Colby T. Ford.** Using Microsoft Dev Box and Azure Compute Galleries for Bioinformatics, August 2022. Medium
- TA17. **Colby T. Ford.** A Deep Dive Look Into Global Monkeypox Transmissions - from January to July 2022., July 2022. Medium
- TA16. **Colby T. Ford.** Deploying Azure Databricks with a Virtual Network and Network Security Group, July 2022. Medium
- TA15. **Colby T. Ford.** Quick Note: What's up with the new SARS-CoV-2 BA.2.75 and BA.5 variants?, July 2022. Medium
- TA14. **Colby T. Ford.** Am I Hallucinating or Can AI Now Design Cancer-Curing Antibodies?, June 2022. Medium
- TA13. **Colby T. Ford.** Scaling Genomics in the Cloud with Microsoft Azure, May 2022. Medium
- TA12. **Colby T. Ford.** How to predict many protein structures with AlphaFold2 at-scale in Azure Machine Learning, January 2022. Medium
- TA11. **Colby T. Ford.** Predicted Protein Interactions of the SARS-CoV-2 B.1.1.529 Variant with Neutralizing Antibodies, November 2021. Medium
- TA10. **Colby T. Ford.** Protein Structure Prediction of the new B.1.1.529 SARS-CoV-2 Spike Variant with AlphaFold2, November 2021. Medium
- TA9. **Colby T. Ford.** How Do We Fix Peer Review? (Because It's Broken...), October 2021. Medium
- TA8. **Colby T. Ford.** I Asked GPT-3 to Write Some Chocolate Chip Cookie Recipes...and I Baked Them), June 2021. Medium
- TA7. **Colby T. Ford.** What is a "variant" as it relates to COVID-19? (for non-geneticists), February 2021. Medium

- TA6. **Colby T. Ford.** Automated Alignment and Variant Calling in Azure using the Microsoft Genomics service and the *msgen* R package, January 2021. Medium
- TA5. **Colby T. Ford.** Better Evaluate COVID-19 Test Performance using Bayes Factors, December 2020. Medium
- TA4. **Colby T. Ford.** Assessment of retail out-of-stock conditions using statistical inference. Technical report, Mariner, 2016
- TA3. **Colby T. Ford** and Wayne Snyder. Revenue protection using machine learning for utilities management. Technical report, Mariner, 2015
- TA2. **Colby T. Ford.** The allure of machine learning, now within reach in Microsoft Azure. Technical report, Mariner, 2015
- TA1. **Colby T. Ford.** Demand forecasting using machine learning to reduce working capital. Technical report, Mariner, 2015

### *Professional Blog Posts*

- B31. **Colby T. Ford.** MIT Lincoln Lab and Tuple Achieve Immense Scalability in SARS-CoV-2 Molecular Modeling with High-Performance Computing, 2023. *Tuple Case Study*
- B30. **Colby T. Ford.** Case Study: Scaling Rare Disease Research in the Azure Cloud, 2022. *Tuple Case Study*
- B29. **Colby T. Ford.** Using Azure CycleCloud and Batch for Scalable HPC Workloads, 2021. *BlueGranite Technical Blog*
- B28. **Colby T. Ford.** Microsoft AI: Look, Listen, Innovate! Hackfest - BlueGranite's Smart City Solution, 2021. *BlueGranite Technical Blog*
- B27. **Colby T. Ford.** Query Millions of Genomic Variants in Minutes with Azure Synapse, 2021. *BlueGranite Technical Blog*
- B26. **Colby T. Ford.** Review: How 3 Life Science Organizations Harness the Power of the Cloud, 2021. *BlueGranite Technical Blog*
- B25. **Colby T. Ford.** Introducing BlueGranite's Azure Data Factory Connector for Illumina BaseSpace, 2021. *BlueGranite Technical Blog*
- B24. **Colby T. Ford.** Event Recap: Shape your Future with Azure Data and Analytics, 2020. *BlueGranite Technical Blog*
- B23. **Colby T. Ford.** Reading Bioinformatics and Genomics Files in Power BI, 2020. *BlueGranite Technical Blog*
- B22. Jon Gore, Thomas J. Weinandy, and **Colby T. Ford.** Take Back Your Data to Gain a Competitive Advantage, 2020. *BlueGranite Technical Blog*
- B21. **Colby T. Ford.** A BlueGranite Blog Post Written (Mostly) by AI, 2020. *BlueGranite Technical Blog*
- B20. **Colby T. Ford.** Give Your Genomics Pipeline a \*Glow\* Up in Azure Databricks, 2020. *BlueGranite Technical Blog*
- B19. **Colby T. Ford.** SIR Modeling on Azure: COVID-19 Hospital Impact Model for Epidemics, 2020. *BlueGranite Technical Blog*
- B18. **Colby T. Ford.** Let's Talk About COVID-19, 2020. *BlueGranite Technical Blog*
- B17. **Colby T. Ford.** Comparing Azure Machine Learning Service and Azure Databricks, 2020. *BlueGranite Technical Blog*



- B16. **Colby T. Ford.** Recap of rstudio::conf(2020) for Data Science and Machine Learning, 2020. *BlueGranite Technical Blog*
- B15. **Colby T. Ford.** Scaling your Genomics Pipeline in the Cloud with Azure Databricks, 2019. *BlueGranite Technical Blog*
- B14. **Colby T. Ford.** Migrating & Scaling Machine Learning Models to Azure Databricks for Cloud-Powered AI, 2019. *BlueGranite Technical Blog*
- B13. **Colby T. Ford.** Introducing the Databricks Unified Analytics Platform for Genomics, 2018. *BlueGranite Technical Blog*
- B12. **Colby T. Ford.** Recap: Spark+AI Summit 2018, 2018. *BlueGranite Technical Blog*
- B11. **Colby T. Ford.** Cognitive Services Showcase: API Search Tools, 2018. *BlueGranite Technical Blog*
- B10. **Colby T. Ford.** Let Azure do the Heavy Lifting on Your AI Workload, 2018. *BlueGranite Technical Blog*
- B9. **Colby T. Ford.** Recap of rstudio::conf 2018, 2018. *BlueGranite Technical Blog*
- B8. **Colby T. Ford.** Microsoft Azure & Databricks = Cloud-Scale Spark Power, 2017. *BlueGranite Technical Blog*
- B7. **Colby T. Ford.** Maximize Your Customer Retention by Predicting Customer Churn, 2017. *BlueGranite Technical Blog*
- B6. **Colby T. Ford.** Become the Maestro of your Genomics Workflow with Bioconductor and Microsoft R Server, 2017. *BlueGranite Technical Blog*
- B5. **Colby T. Ford.** Publishing Predictive Web Services with Microsoft R Server, 2017. *BlueGranite Technical Blog*
- B4. **Colby T. Ford.** Data Visualization for Bioinformatics with R in Power BI, 2017. *BlueGranite Technical Blog*
- B3. **Colby T. Ford.** Webinar Recap: Distributed Computing & R Server, 2017. *BlueGranite Technical Blog*
- B2. **Colby T. Ford.** SAS Enterprise Guide vs. Microsoft Azure Machine Learning, 2017. *BlueGranite Technical Blog*
- B1. **Colby T. Ford.** ImpoRting and ExpoRting: Getting Data Into and Out of R, 2017. *BlueGranite Technical Blog*

## Conferences, Training, Press, and Speaking Engagements

|           |  |                  |                   |
|-----------|--|------------------|-------------------|
| Nov. 2014 | Microsoft Roadmap Event                                  | Speaker          | Charlotte, NC     |
| Sep. 2015 | Microsoft Cortana Analytics Conference                   | Attendee         | Seattle, WA       |
| Sep. 2016 | Advanced Pharma Analytics                                | Attendee         | Newark, NJ        |
| Feb. 2017 | Analytics for Social Good - U. Cincinnati                | Speaker          | Cincinnati, OH    |
| Mar. 2017 | Society for Applied Anthropology Conference              | Speaker          | Santa Fe, NM      |
| Mar. 2017 | BlueGranite Distributed Computing Webinar                | Speaker          | Online            |
| Oct. 2017 | BlueGranite Retail Webinar                               | Speaker          | Online            |
| Nov. 2017 | Nissan Analytics Expo                                    | Speaker          | Nashville, TN     |
| Jan. 2018 | rstudio::conf(2018)                                      | Attendee         | San Diego, CA     |
| Jun. 2018 | Spark + AI Summit 2018                                   | Attendee         | San Francisco, CA |
| Sep. 2018 | Big Data Ignite  | Speaker          | Grand Rapids, MI  |
| Sep. 2018 | Microsoft Ignite   | Attendee         | Orlando, FL       |
| Jan. 2019 | rstudio::conf(2019)                                      | Attendee         | Austin, TX        |
| Mar. 2019 | Microsoft Azure AI Hackfest                              | Attendee         | New York, NY      |
| Apr. 2019 | Azure Databricks Training Event                          | Speaker          | Chicago, IL       |
| May 2019  | CECHS Commencement                                       | Speaker          | Lenoir, NC        |
| Jun. 2019 | BlueGranite Azure Databricks Retail Webinar              | Speaker          | Online            |
| Jun. 2019 | Azure Databricks Training Event                          | Speaker          | Charlotte, NC     |
| Jun. 2019 | Azure Databricks Training Event                          | Speaker          | Detroit, MI       |
| Jul. 2019 | Databricks Retail Webinar                                | Speaker          | Online            |
| Oct. 2019 | UNCC CCI Ph.D. Open House Panel                          | Panelist         | Charlotte, NC     |
| Nov. 2019 | UNCC Data Science Initiative Git Workshop                | Speaker          | Charlotte, NC     |
| Jan. 2020 | PyData Charlotte   | Speaker          | Charlotte, NC     |
| Jan. 2020 | rstudio::conf(2020)                                      | Attendee         | San Francisco, CA |
| Apr. 2020 | WBTB COVID-19 Interview                                  | Interviewee      | Online            |
| May 2020  | CBS News COVID-19 Interview                              | Interviewee      | Online            |
| May 2020  | UCSD HIV Dynamics Conference                             | Speaker          | Online            |
| Jun. 2020 | Spark + AI Summit 2020                                   | Speaker/Panelist | Online            |
| Jul. 2020 | SBE Symposium: Virology in the SARS-CoV-2 era            | Speaker          | Online            |
| Aug. 2020 | BlueGranite Scaling Genomic Analyses in Azure Webinar    | Speaker          | Online            |
| Sep. 2020 | TEDxUNCCCharlotte  | Speaker          | Charlotte, NC     |
| Oct. 2020 | BlueGranite Loan Risk Analysis Webinar                   | Speaker          | Online            |
| Jan. 2021 | BlueGranite AI-in-a-Day Training Event                   | Speaker          | Online            |
| Jan. 2021 | rstudio::global(2021)                                    | Attendee         | Online            |
| Jan. 2021 | Lenoir NewsTopic Interview                               | Interviewee      | Online            |
| Mar. 2021 | Microsoft AI: Look, Listen, Innovate! Solution Hackathon | Participant      | Online            |
| May 2021  | Data + AI Summit 2021                                    | Attendee         | Online            |
| Jul. 2021 | Microsoft Ignite 2021                                    | Attendee         | Online            |
| Jul. 2021 | Alzheimer's Association International Conference 2021    | Attendee         | Denver, CO        |
| Oct. 2021 | Microsoft Research Summit                                | Attendee         | Online            |
| Nov. 2021 | Microsoft Ignite   | Attendee         | Online            |
| Dec. 2021 | The Economist Interview on Omicron Modeling              | Interviewee      | Online            |
| Jan. 2022 | WIRED Interview on Omicron Modeling                      | Interviewee      | Online            |
| Feb. 2022 | United Nations ITU AI for Good Programme                 | Speaker          | Online            |
| Jul. 2022 | Microsoft Inspire  | Attendee         | Online            |
| Jul. 2022 | rstudio::conf(2022)                                      | Attendee         | Washington DC     |
| Jul. 2022 | Alzheimer's Association International Conference 2022    | Panelist         | San Diego, CA     |
| Oct. 2022 | UNCC Seminar: Getting Started with Git                   | Instructor       | Charlotte, NC     |
| Nov. 2022 | Microsoft Cloud for Healthcare Event (TTT)               | Participant      | Seattle, WA       |
| Jan. 2023 | NC HIMSS Event   | Participant      | Charlotte, NC     |
| Apr. 2023 | Microsoft MVP Global Summit                              | Awardee          | Redmond, WA       |
| Jun. 2023 | Data + AI Summit 2023                                    | Attendee         | San Francisco, CA |
| Jun. 2023 | MITLL Biotechnology and Resilient Human Systems Workshop | Attendee         | Boston, MA        |
| Jun. 2023 | ARMI National Conference on the Future of Biofabrication | Speaker          | Manchester, NH    |
| Jul. 2023 | Alzheimer's Association International Conference 2023    | Presenter        | Amsterdam, NL     |
| Sep. 2023 | posit::conf(2023)  | Speaker          | Chicago, IL       |
| Oct. 2023 | UNCC Seminar: Getting Started with Git                   | Instructor       | Charlotte, NC     |
| Nov. 2023 | Microsoft Ignite   | Attendee         | Redmond, WA       |

## Skills

|                             |  |
|-----------------------------|--|
| Languages:                  | Python • R • SQL • Javascript • SAS • Visual Basic         |
| High Performance Computing: | Spark (Databricks) • K8s • CUDA • Hadoop • MPI             |
| Cloud Computing:            | Microsoft Azure • AWS • Docker • Terraform                 |
| Visualization:              | Tableau • Power BI • Shiny • D3.js                         |
| Markup/Web:                 | Markdown • $\LaTeX$ • HTML5 • CSS3                         |
| Bioinformatics:             | Phylogenetics • Haplotyping • Protein Modeling • Epistasis |

## 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 Advisory Board                        |
| 2016-2017    | The Society for Anthropological Sciences                            |
| 2018-2019    | American Association for the Advancement of Science                 |
| 2020-Present | International Society for Computational Biology                     |
| 2021-Present | International Society for Infectious Diseases                       |
| 2021-Present | International Society to Advance Alzheimer's Research and Treatment |
| 2022-2023    | American Cancer Society - Associate Board of Advisors               |

## Student Advising

|                       |                    |                                    |
|-----------------------|--------------------|------------------------------------|
| Jan. 2019 - May 2019  | Jainmary Jose      | Cloud Computing Teaching Assistant |
| Aug. 2019 - Dec. 2019 | Anjali Khushalani  | Cloud Computing Teaching Assistant |
| Jan. 2020 - May 2020  | Kovidh Vegesna     | UNCC Data Science Practicum Intern |
| May 2020 - Sep. 2020  | Somesh Kale        | Amissa Developer Intern            |
| May 2020 - Sep. 2020  | Heet Detroja       | Amissa Developer Intern            |
| May 2020 - Sep. 2020  | Chaitanya Darade   | Amissa Developer Intern            |
| Sep. 2020 - May 2021  | Adesoji Ademiluyi  | Bioinformatics Research Assistant  |
| Sep. 2020 - Oct. 2021 | Eh So Wah          | Amissa Developer Intern            |
| Jan. 2022 - May 2022  | Paige Oldiges      | Cloud Computing Teaching Assistant |
| Jun. 2022 - Sep. 2022 | Carter DeMordaunt  | Tuple Bioinformatics Intern        |
| Jan. 2023 - May 2023  | Utweij Sai Nalluri | Cloud Computing Teaching Assistant |

## Awards

|           |   |                            |
|-----------|---|----------------------------|
| Apr. 2022 | 40 under 40                             | Charlotte Business Journal |
| Apr. 2022 | Impact Award                            | Seagen, Inc.               |
| Mar. 2023 | Alumnus of the Year                     | UNC Charlotte              |
| Apr. 2023 | Most Valuable Professional (MVP), Azure | Microsoft                  |
| Jun. 2023 | Impact Award                            | Seagen, Inc.               |
| Apr. 2024 | Most Valuable Professional (MVP), Azure | Microsoft                  |

## Certifications

### Technical Certifications

|           |  |                            |
|-----------|--|----------------------------|
| May 2018  | Databricks Certified Developer - Apache Spark 2.x for Python | Certification #: 53873     |
| Nov. 2019 | Microsoft Azure Data Scientist Associate (DP-100)            | Exam Writer                |
| Sep. 2020 | Microsoft Data Science Partnership Program                   | Custom Core Certification  |
| Oct. 2020 | Microsoft Azure AI Engineer Associate (AI-100)               | Certification #: H532-5207 |
| Oct. 2020 | Microsoft Azure AI Fundamentals (AI-900)                     | Certification #: H533-2414 |
| Nov. 2020 | Databricks Partner Program - Developer Champion              | Certification #: 917207    |
| Feb. 2021 | Microsoft Certified Trainer                                  | Certification #: 17875868  |

### Research Certifications

|           |   |                     |
|-----------|---|---------------------|
| Dec. 2019 | CITI Program - Biomedical Researcher (IRB)                              | Record ID: 34535340 |
| Dec. 2019 | CITI Program - Data or Specimens Only Research (IRB)                    | Record ID: 34853732 |
| Nov. 2020 | CITI Program - Animal Biosafety   | Record ID: 39539397 |
| Nov. 2020 | CITI Program - Laboratory Personnel BSS                                 | Record ID: 39539395 |
| Nov. 2020 | CITI Program - USDA Permits   | Record ID: 39539400 |
| Nov. 2020 | CITI Program - Shipping and Transport of Regulated Biological Materials | Record ID: 39539399 |
| Nov. 2020 | CITI Program - Principal Investigators BSS                              | Record ID: 39539394 |
| Nov. 2020 | CITI Program - Institutional Biosafety Committee (IBC) Members BSS      | Record ID: 39539396 |
| Jan. 2021 | CITI Program - Social & Behavioral Research (IRB)                       | Record ID: 40316365 |
| Jun. 2021 | CITI Program - Good Clinical Practices (GCP)                            | Record ID: 43096988 |
| Feb. 2023 | CITI Program - Biomedical Sciences: Responsible Conduct of Research     | Record ID: 54594415 |
| Feb. 2023 | CITI Program - Biomedical Investigators and Research Study Team         | Record ID: 54601364 |

## Journal Peer Review Activity

|                            |  |
|----------------------------|--|
| Frontiers in Pediatrics    | Pediatric Infectious Diseases                                |
| Frontiers in Chemistry     | Chemical Biology   |
| Frontiers in Immunology    | Vaccines and Molecular Therapeutics                          |
| Frontiers in Physiology    | Red Blood Cell Physiology                                    |
| Frontiers in Medicine      | Infectious Diseases - Surveillance, Prevention and Treatment |
| Frontiers in Public Health | Infectious Diseases: Epidemiology and Prevention             |
| Science Advances           | Biomedicine and Life Sciences                                |

## Public Sequence Contributions

|          |                         |  |          |            |
|----------|-------------------------|--|----------|------------|
| NCBI SRA | BioProject: PRJNA783000 | <i>P. falciparum</i> CSP/ MSP-1 amplicon sequences | Ghana    | 90 samples |
| NCBI SRA | BioProject: PRJNA784582 | <i>P. vivax</i> transcriptomes                     | Ethiopia | 10 samples |

## Funding

|                          |                         |   |             |                             |         |
|--------------------------|-------------------------|---|-------------|-----------------------------|---------|
| Aug. 2024 -<br>Aug. 2025 | NIH   NIA SBIR Phase I  | Augmented Preclinical Alzheimer's Disease Detection Through Wearable Health and Driving Behavior Data   | \$505,614   | Pending                     | PI      |
| Aug. 2023 -<br>Aug. 2024 | NIH   NIA SBIR Phase II | Empowering Advanced Alzheimer's Disease and Dementia Research Through Remote Patient Monitoring and Cloud-Based Wearable Devices                          | \$2,336,486 | Pending                     | Co-I    |
| Aug. 2023 -<br>Aug. 2025 | US DoD   Army           | Entomological Surveillance Dashboard, Harnessing Geographic Information Systems to Modernize Military Entomology  | \$150,000   | Funded                      | Site PI |
| Apr. 2022 -<br>Aug. 2023 | NC SBIR Match           | A Multifaceted Digital Health Application to Advance Alzheimer's Disease Patient Monitoring, Safety, Caregiving, and Research                             | \$75,000    | Funded                      | Co-I    |
| Aug. 2021 -<br>Aug. 2023 | NIH   NIA SBIR Phase I  | A Multifaceted Digital Health Application to Advance Alzheimer's Disease Patient Monitoring, Safety, Caregiving, and Research                             | \$495,787   | Funded<br>1R43AG072981-01A1 | Co-I    |
| Apr. 2021 -<br>Sep. 2022 | NSF Innovation Corps    | Investigating the Utility of Digital Biomarkers with Wearable Devices and Artificial Intelligence in Alzheimer's Disease and other Neurological Disorders | \$50,000    | Funded<br>2127407           | PI/TL   |
| May 2020 -<br>Dec. 2020  | UNCC SDS Seed Grant     | Analytical Modeling of IoMT data to predict onset and progression of Alzheimer's  | \$20,000    | Funded                      | Co-PI   |
| Jan. 2019 -<br>May 2019  | Microsoft               | Azure Funding for Cloud Computing Course  | \$30,000    | Funded                      | PI      |
| Oct. 2014 -<br>Present   | Microsoft               | Various Business Incentive Funds (BIF), Partner Investment Engine (PIE) Funds, GoFast Funding, and End Customer Investment Funds (ECIF).                  | >\$750,000  | Funded                      | PI      |