Data Science Initiative Team

Table 1: The Data Science Initiative team

Name	Title	Name	Title
Mark Aldrich	Associate Professor of Spanish and Executive Director, Clarke Forum for Contemporary Issues	**Katie Marchetti**	Assistant Professor of Political Science
Maiko Arashiro	Assistant Professor of Environmental Studies	**Emily C. Marshall**	Associate Professor of Economics and Faculty Director QR Center
Thomas Arnold	Professor of Biology	**Tracy McKay**	Lecturer in Mathematics
Shawn Bender	Associate Professor of East Asian Studies	**Amy McKiernan**	Assistant Professor of Philosophy
Grant Braught	Professor of Computer Science	**Sarah Niebler**	Assistant Professor of Political Science
James Ciarrocca	GIS Specialist	**Patricia Pehlman**	Director of Academic Technology
Tara Dedrickson	Dickinson College Class of '21	**Lan Pham**	Dickinson College Class of '22
Maggie Douglas	Assistant Professor of Environmental Science	**Anthony S. Rauhut**	Professor of Psychology
Kate Erfle	Dickinson College Class of '21	**David Richeson**	Professor of Mathematics
Stephen Erfle	Professor of INBM	**Michael Roberts**	Associate Professor of Biology
Jeffrey S. Forrester	Associate Professor of Mathematics	**Peter Sak**	Associate Professor of Earth Sciences
Richard Forrester	Professor of Mathematics	**Farhan Siddiqui**	Assistant Professor of Computer Science
Amity Fox	Dean & Director of Internships, Externships, Fellowships	**Michael Skalak**	Lecturer/Technician in Computer Science
Holley Friedlander	Assistant Professor of Mathematics	**Dana J. Somers**	Assistant Professor of Biology
Jason Gavenonis	Assistant Professor of Chemistry	**David A. Souerwine**	Dickinson College Class of '74
Kirsten Guss	Associate Professor of Biology Stafford Endowed Chair in Bioinformatics	**Susan Stebbins Souerwine**	Dickinson College Class of '75
Jorden Hayes	Assistant Professor of Earth Sciences	**Amy Steinbugler**	Associate Professor of Sociology
John Henson	Senior Associate Provost of Academic Affairs and Charles A. Dana Professor of Biology	**Barry Tesman**	Professor of Mathematics
Lorelei Koss	Professor of Mathematics	**Eddie Tu**	Assistant Professor of Mathematics
Noreen Lape	Associate Provost of Academic Affairs and Director of the Writing Program	**Anthony Underwood**	Associate Professor of Economics
Neil Leary	Director, Center for Sustainability Education	**Xiaolu Wang**	Assistant Professor of INBM
John MacCormick	Associate Professor of Computer Science	**Dave Webster**	Associate AD and Head Men's Lacrosse Coach
Chauncey Maher	Associate Professor of Philosophy	**Amy Witter**	Professor of Chemistry

Notes: International Business and Management (INBM)

Table 2: Summer 2019 faculty working group

Name	Title	Name	Title
Thomas Arnold	Professor of Biology	Emily C. Marshall	Associate Professor of Economics and Faculty Director QR Center
Stephen Erfle	Professor of INBM	Tracy McKay	Lecturer in Mathematics
Jeffrey S. Forrester	Associate Professor of Mathematics	David Richeson	Professor of Mathematics
Richard Forrester	Professor of Mathematics	Michael Roberts	Associate Professor of Biology
John Henson	Senior Associate Provost of Academic Affairs and Charles A. Dana Professor of Biology	Peter Sak	Associate Professor of Earth Sciences
Neil Leary	Director, Center for Sustainability Education	Dana J. Somers	Assistant Professor of Biology
		Michael Skalak	Lecturer/Technician in Computer Science

Biographies of Proposal Authors

Tara Dedrickson ('21) is a rising senior at Dickinson College majoring in Computer Science and Quantitative Economics with a Mathematics minor and serves as a captain of the Women's Varsity Soccer team. At Dickinson, she performed temporal data analysis on electricity usage in the Baltimore area, studied Database System design and usage, and used programming as a tool to both model scenarios and analyze variable relationships. She is particularly interested in studying how to use data to supplement technology and applied mathematics to make business decisions. Over the summers, Tara interns at Enterprise Knowledge where she developed an interactive and dynamic intranet that organizes the company's information and serves as a sample design for client projects.

Dr. Maggie Douglas is an Assistant Professor of Environmental Science at Dickinson College. Her research employs eclectic methods, including analysis and synthesis of large datasets in the R statistical language, to elucidate the sustainability of agricultural management practices. Her work has been supported by NSF and the US Department of Agriculture, and published in journals including *BioScience*, *Scientific Reports*, and *Environmental Science & Technology*. As a teacher and research mentor, she builds students' capacity to use data to answer important environmental questions.

Dr. Richard (Dick) Forrester received his Ph.D. in Mathematical Sciences from Clemson University in 2002. His scholarship is at the interface of computer science and operations research, which is a scientific approach to analyzing problems and making decisions. The majority of his research has centered around the development of techniques for solving problems that can be modeled as nonlinear 0-1 programs. He has directed a number of student-faculty research projects that have resulted in peer-reviewed publications, including the development of a technique to assign Dickinson students to first-year seminars, the determination of an optimal crop rotation for the college's organic farm, and an algorithm for determining an efficient theme park tour. As an applied mathematician, his teaching interests primarily center around operations research, statistics, data science, analysis of algorithms, and computational mathematics. His work has appeared in high-quality journals such as *Discrete Optimization*, *Operations Research Letters*, *Naval Research Logistics*, and *Socio-Economic Planning Sciences*.

Dr. Jeffrey Forrester is an Associate Professor of Mathematics at Dickinson College. His research focuses on mathematical biology and genetic networks and includes projects on leukemia and cancer cell biology. Before arriving at Dickinson, he was an Assistant Research Professor at Vanderbilt University in the Department of Pharmacology where he worked on the development of techniques for lipidomic cellular analysis.

Dr. Chauncey Maher earned his undergraduate degree from the University of Maryland, a Master's degree from the University of Chicago, and a Ph.D. from Georgetown University. He is an Associate Professor of Philosophy at Dickinson College, and he has published two books addressing various philosophical questions about minds: *The Pittsburgh School of Philosophy* (Routledge 2012) and *Plant Minds* (Routledge 2017). He's currently writing a book about how moderation perpetuates racial inequality.

Dr. Emily C. Marshall is an Associate Professor of Economics at Dickinson College. She earned her Ph.D. in Economics from the University of Kentucky, and her research interests include monetary and macroeconomics, public economics, behavioral economics, and economic education. Her research has recently been published in *Macroeconomic Dynamics*, *Justice Quarterly*, the *Journal of Economic Education*, and the *American Economic Association Papers and Proceedings*. While at the University of Kentucky, Emily was named Alpha Kappa Psi professor of the month. Emily is active in the economics teaching community, attending and serving as a presenter, discussant, session chair, and panel member at the Conference on Teaching and Research in Economics Education, the Southern Economics Association meetings, St. Louis Federal Reserve Bank Annual Professors Conference, University of Kentucky Economics Teaching Workshop, and the American Economic Association meetings. She regularly teaches Intermediate Macroeconomic Theory, Econometrics and Advanced Econometrics, and upper-level courses on the Great Recession and Asset Price Bubbles and Financial Crises.

Dr. Tracy McKay completed her Ph.D. in Mathematics at Iowa State University in 2012. Her thesis work was on the edit distance functions for certain types of graphs, and she enjoys working on problems involving graph colorings, extremal graph theory, and combinatorics. Since completing her degree at ISU, she has worked at Dickinson College as both a Visiting Assistant Professor and as a Lecturer, teaching courses in calculus, statistics, and linear algebra.

Dr. Anthony (Tony) Rauhut is a Professor of Psychology and contributing faculty member to Dickinson's Neuroscience Program. He earned a BA in Psychology from St. Louis University in 1993, and a PhD in Neuroscience and Behavior from the University of Massachusetts, Amherst in 1999. He began at Dickinson College in 2002, after conducting a 3-year postdoctoral research fellowship at the University of Kentucky, Lexington. His program of research has been supported by the NIH, and involves using animal models to understand the behavioral and neurobiological mechanisms underlying the comorbidity of depression and drug dependence. He and his students have published in various pharmacology journals such as *Physiology and Behavior*, *Pharmacology, Biochemistry and Behavior*, and *Behavioural and Brain Research*. He teaches courses in animal learning, statistics, and psychopharmacology.

Dr. David Richeson graduated from Hamilton College in 1993, received his Ph.D. in mathematics from Northwestern University in 1998, and had a post-doc at Michigan State University. He came to Dickinson College in 2000, where he is now a professor of mathematics. He was the editor of *Math Horizons*, the undergraduate magazine of the Mathematical Association of America (MAA), from 2014 to 2019. He is interested in a wide range of mathematics including topology, dynamical systems, geometry, the history of mathematics, recreational mathematics, and expository mathematical writing. His book *Euler's Gem: The Polyhedron Formula and the Birth of Topology* (Princeton University Press, 2008) received the MAA's 2010 Euler Book Prize, was reissued in 2019 in the prestigious Princeton Science Library series, and has been or will be translated into Portuguese, Korean, Japanese, Chinese, Spanish, and Russian. His new book, *Tales of Impossibility: The 2000-Year Quest to Solve the Mathematical Problems of Antiquity,* was published by Princeton University Press last fall. At Dickinson, he has served as the chair of the Department of Mathematics and Computer Science, and as a member of the Information Technology and Services Committee, the Planning and Budget Committee, the Judicial Pool, and (starting this fall) the Academic Program and Standards Committee. He has supervised seven honors thesis students.

Dr. Michael Roberts earned his undergraduate degree from Colgate University, a Master's of Science degree from Miami University, and a Ph.D. from Yale University in 1988. His research interests center on the biology of cancer, in particular leukemia, and the mechanisms by which cancer cells might be reprogrammed to either behave normally or self destruct. He and his students use genomic, proteomic and bioinformatic methods to explore changes in gene expression that distinguish cancer cells from normal cells. His teaching interests included genetics, molecular genetics, bioinformatics and the biology of cancer.

Dr. Farhan Siddiqui is an Assistant Professor in the Department of Mathematics and Computer Science at Dickinson College. Professor Siddiqui earned her Bachelor's degree in Computer Science and Engineering from Osmania University (India) and her M.S. and Ph.D. degrees in Computer Science from Wayne State University, Michigan, USA. Her research interests are in Mobile and Ubiquitous Computing, Internet of Things, Network Protocols, Quality of Service, System, Network, and Cyber Security.

Michael Skalak has worked as Lecturer/Technician in the Mathematics and Computer Science Department at Dickinson College since 2015. He received his undergraduate degree from Northwestern University and masters' degrees in teaching and computer science from the University of Virginia. His current projects include working on the FarmData system, which helps small and organic farmers (including the Dickinson farm) manage their fields and livestock. He also has developed innovative pedagogical techniques ranging from POGIL-inspired project management to computer science theater.

Dr. Dana J. Somers is an Associate Professor of Biology at Dickinson College. She earned a B.A. in Biology and Mathematics from Franklin and Marshall College in 2002 and completed her Ph.D. in Genetics at the University of Wisconsin-Madison in 2007. Her research focuses on microbial genome evolution, particularly as it relates to understanding microbial ecology and biodiversity. She and her students employ functional, ecological, and evolutionary genomics techniques to address basic questions related to yeast biodiversity and evolution as well as microbes in Arctic environments. Her research has been published in *PNAS*, *PLoS Genetics*, *Genome Biology and Evolution*, and *Microbial Ecology*. She teaches classes in genetics, population and quantitative genetics, and bioinformatics.

Dr. Eddie Tu is an assistant professor in the Department of Mathematics and Computer Science at Dickinson College. Professor Tu earned his Ph.D. in Mathematics and M.S. in Statistics at the University of Tennessee, Knoxville in 2017. His research interests are in theoretical probability, stochastic processes, statistics, and applied machine learning.

Dr. Anthony (Tony) Underwood is associate professor and Chair in the Department of Economics at Dickinson College in Carlisle, PA. Professor Underwood earned his Ph.D. in Economics from Colorado State University in 2013. His dissertation examined the role of demographic change, especially declining household size, in determination of household expenditures and the resulting carbon dioxide emissions. He has since published in several academic journals, including the *Journal of Risk and Uncertainty*, *Energy Policy*, *Ecological Economics*, *The Journal of Economic Education*, and *Review of Political Economy*. His research interests include household energy use and emissions, the environmental implications of urban density and the sharing economy, the challenges for climate change mitigation posed by demographic change, and economic education. Professor Underwood regularly teaches environmental economics, econometrics, and microeconomics. In his advanced econometrics course, students practice the importance of reproducible and transparent methods in research thorough completion of their own empirical research project, which is also the focus of a 2019 publication in *The Journal of Economic Education* with Prof. Emily Marshall. He also teaches courses in population and urban economics and is a contributing faculty member in the Social Innovation and Entrepreneurship certificate program.