Taylor K McKenzie

U.S. Citizen, DOE Q Clearance

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Education

Ph.D. Economics *June 2017*

University of Oregon, Eugene, OR

Dissertation: Railroads, Their Regulation, and Its Effect on Efficiency and Competition

Committee: Dr. Wesley W. Wilson, Dr. Van Kolpin, Dr. Jeremy Piger, Dr. Diane Del Guercio, Dr. Keaton Miller

M.S. Economics *December 2013*

University of Oregon, Eugene, OR

Advisor: Dr. Wesley W. Wilson

B.A. Mathematics and Economics *May 2012*

Willamette University, Salem, OR *Summa Cum Laude*

Advisors: Dr. Raechelle Mascarenhas and Dr. Peter Otto

Relevant Skills

- Expertise in working with stakeholders to identify problems and goals, then crafting objective analyses that provide understanding of dynamics and tradeoffs and inform intelligent strategy. Experience working with internal stakeholders, such as program managers, directors, and senior leadership, as well as external customers from NASA, Air Force, the US Army, and DOE.
- Extensive experience using R, Python, Matlab, and Stata to perform simulations/emulations of cyber and physical systems, implement statistical methods, and create visualizations that inform policy analyses. Well-practiced in drawing on disparate data sources including quantitative, qualitative, and simulation data and combining those sources to arrive at objective and informative insights.
- Expertise in organizing, leading, and collaborating with multi-disciplinary teams that utilize breadth of expertise and perspectives to produce robust, imaginative, and insightful analyses. Experience with developing connections with individuals and groups across and beyond Sandia that can be leveraged to address a wide range of problems and studies.

Relevant Work Experience

Sandia National Laboratories *March 2020 - Present*

Systems Analyst, Strategic Futures and Policy Analysis Group

- Designed and performed quantitative and qualitative analyses to assess and inform laboratory policy, including development of Sandia's transition to a hybrid work posture, laboratory and workforce policies that helped Sandia navigate COVID-19, and strategies to improve Sandia's technology transfer processes. Contributed to and presented briefings for these analyses to high-level stakeholders including Sandia center directors and NNSA.
- Contributed to Global Futures studies on Space, Collective Security, R&D, and Arms Control, and led study on the Future of Economic Value and National Security. Prepared and delivered briefings to Sandia's Senior Leadership Team, stakeholders across the lab, and external partners at the Office of Science and Technology Policy, the National Institute for Standards and Technology, and the Secret Service.

Sandia National Laboratories *August 2017 - March 2020*

Cybersecurity Researcher, Cyber Resilience R&D Group

- Designed and implemented statistical analyses of risk and resilience of cyber systems drawing on classical and Bayesian statistics and uncertainty quantification methods. Performed and analyzed experiments on cyber-physical critical infrastructure systems using state-of-the-art emulation systems and techniques. These studies informed stakeholders how to improve resilience of their systems to cyber-physical disruptions as well as highlighted statistical issues around cyber emulation outcomes that guided future analyses.

University of Oregon *Fall-Spring 2012-2017*
Graduate Teaching Fellow
Department of Economics

- Developed curriculum and acted as independent instructor of five courses covering intermediate microeconomic theory, industrial organization, and development economics. Served as a teaching assistant and provided additional instruction to undergraduate and graduate students.
- Conducted research in industrial organization, authoring the dissertation "Railroads, Their Regulation, and Its Effect on Efficiency and Competition."

Pacific Northwest National Laboratory *Summers of 2010-2012, 2014*
National Security Intern
Knowledge Discovery and Informatics Group
Mentors: Dr. Courtney Corley and Dr. Satish Chikkagoudar

- Conducted research into biosurveillance, disease propagation, social media phenomenology, and cybersecurity. Developed systems models to describe spread of disease, predictive statistical models to describe social media trends and topics, and game-theoretic statistical models used to recreate inter-organizational email traffic for use in cyber simulations.

Notable Results and Accomplishments

- Sandia Employee Recognition Award for contributions to COVID-19 Pandemic Modeling Effort. Personal contributions: Performed analysis of economic impacts under various projected pandemic and return-to-workplace scenarios. This work also earned personal recognition from J. Stephen Binkley, Acting Director of DOE Office of Science on February 3, 2021.
- Sandia Employee Recognition Award for contributions to Disablement Laser project. Personal contributions: Performed statistical analysis of kill times under various scenarios and configurations, informing expectations real-world outcomes.
- Performed review of statistical methodology in risk assessment of Mars 2020 rover launch as a member of the Interagency Nuclear Safety Review Board. Developed alternative methodology that more accurately described physical phenomenology of crash events. Worked closely with Air Force/NASA and risk assessment team to demonstrate improvements provided by alternative methodology, eventually leading to that methodology being adopted for current and future missions.
- Member of the Interagency Nuclear Safety Review Board, which performed the risk analysis of Mars 2020/Perseverance. Worked closely with Air Force/NASA and risk assessment team to identify analysis needs and implemented uncertainty quantification methods that significantly improved understanding of risk for contemporary and future missions. My leadership of the statistical analysis team earned a Technical Excellence Award from Sandia in 2020.
- Involved with developing theory of uncertainty quantification for experiments that quantify risk posed to and resilience of cyber systems. Developing framework to address often unusual statistical properties of outcomes from cyber experiments and applying those methods to existing simulations to inform customer decisions.
- Development and maintenance of R package `snfa` (Smooth Non-Parametric Frontier Analysis), available on the Comprehensive R Archive Network (CRAN). Applications to projects analyzing technology transfer efficiency at national laboratories are being explored.
- Best dissertation award from the American Economic Association's Transportation and Public Utilities Group and Ph.D. Research Paper Award from the University of Oregon for paper titled "Markups and Scale Elasticities for Differentiated Railroad Networks."

Publications and Reports

- Aamir, Munaf, Taylor McKenzie, Walter Beyeler, Ryan Kennedy, Raymond Reilly III (2022). Global Futures Series: The Future of Economic Value and National Security. SAND2022-8480PE (UUR).

- Hayden, Nancy, Marie Arrieta, Mary Ann Cordova, Taylor McKenzie, and Michael Vannoni (2020). Telecommuting Best Practices. SAND2020-5530R (UUR).
- Keller, Elizabeth Kistin, Ryan Kennedy, Nancy Hayden, Catherine Branda, Julia Fruetel, Kelsey Abel, Mikaela Armenta, Ashley Maes, Taylor McKenzie, Emily O'Bryan, Danielle Rodriguez, Bryn Stuart, and Nerayo Teclemariam (2020). Sandia Covid-19 Scenarios Initiative: Anticipating and Shaping Mission Futures. SAND2020-7168R (OUO Ex. 5).
- Hayden, Nancy, Munaf Aamir, John Foley, Patricia Hernandez, Elizabeth Keller, Caroline Maloney, Taylor McKenzie, Carrie McNeil, Thomas Nelson, Emily O'Bryan, Elizabeth Roll, Matthew Sumner, and David White. SLT COVID-19 Scenario Exercise. SAND2020-12622R (OUO Ex. 5).
- McKenzie, Taylor, Thomas D. Tarman, Christopher Lamb (2020). Uncertainty Quantification for Cyber-Physical PWR Experiments. Proceedings of the 28th Annual International Conference on Nuclear Engineering. SAND2020-1357C (UUR).
- Keller, Elizabeth Kistin, Ryan Kennedy, Taylor McKenzie, Emily O'Bryan, Bryn Stuart, and Nerayo Teclemariam (2020). Sandia Covid-19 Scenarios Initiative: FY21 Budget Fluctuations and Adaptations. SAND2020-7166R (OUO Ex. 5).
- Galiardi, Meghan, Nicholas Jacobs, Christine Lai, Taylor McKenzie, Trisha Miller, Christopher Perr, Zachary Thomas, Eric Vugrin, and Lynn Yang (2019). Metric Development for the NETCOM System Impact and Resilience (SIR) Project. SAND2019-0875R (OUO Ex. 7).
- Yang, Lynn Rossitza Homan, Sean DeRosa, Ann Hammer, Dennis Raymond Imbro, Taylor McKenzie, Trisha Hoette Miller, Daniel J. Pless, Mark D. Tucker, and Gregory D. Wyss (2018). CSA Engagement Prioritization Methodology (EPM) Overview and Process. SAND-2018-11322 (OUO Ex. 7).
- Färe, Rolf, Taylor McKenzie, Wesley Wilson, and Wenfeng Yang (2017). Mergers, efficiency, and productivity in the railroad industry: An attribute-incorporated data envelopment analysis approach. Transportation Policy and Economic Regulation: Essays in Honor of Theodore Keeler.
- Corley, C.D., C. Dowling, S.J. Rose, and Taylor McKenzie (2013). SociAL Sensor Analytics: Measuring Phenomenology at Scale. *2013 IEEE International Conference on Intelligence and Security Informatics*, 61-66.
- Corley, C.D., et al, including Taylor McKenzie (2012). Assessing the Continuum of Event-Based Biosurveillance Through an Operational Lens. *Biosecurity and Bioterrorism 10(1)*, 131-41.