CHARLES D. NICHOLSON, PH.D.

Associate Professor
School of Industrial and Systems Engineering
MS Data Science and Analytics Program
Gallogly College of Engineering
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SUMMARY

Dr. Charles Nicholson is an associate professor at the University of Oklahoma in the School of Industrial and Systems Engineering and a principal faculty member of the Data Science and Analytics program in the Gallogly College of Engineering. He earned his Ph.D. in Operations Research from the Lyle School of Engineering at Southern Methodist University in Dallas, Texas in 2010.

Before joining the University of Oklahoma, he worked in the field of data science and analytics for 12 years. During this time, he led multiple efforts and various teams in designing a broad array of proprietary data analytics solutions for multiple corporations across the nation and internationally. Projects include a wide variety of predictive and prescriptive analytics for diverse companies representing multi-billion dollar retail, finance, and restaurant industries. Successful data-intensive solutions developed include customer-level behavior prediction, fraudulent activity detection, GIS-based strategic and competitive targeting, and product allocation optimization.

After joining the University of Oklahoma in 2013, Dr. Nicholson developed two new graduate courses which became part of the core required curriculum of the Masters in Data Science and Analytics. His courses, offered on-campus and online, have attracted attention outside of the college and it is common to have students electing to enroll from other majors including Petroleum Engineering, Chemical Engineering, Industrial and Systems Engineering, Management, Economics, and others. His courses are often at full capacity, and it is not unusual to have 70+ graduate students enrolled with more still on the waiting list. Dr. Nicholson won the Gallogly College Teaching Scholar Award in 2017 in recognition of his excellence in teaching.

His research area is in complex resilient network systems, novel predictive and classification modeling approaches, and applied meta-heuristics. His current research activities are focused on modeling, optimization, and machine-learning algorithm methods to enhance communities (e.g., cities, towns) so that they can withstand and recover rapidly from major natural disasters. He works with experts from Civil Engineering, Economics, Social Science, and Computer Science to study and quantify how disruptions in the complex interdependent infrastructure systems that underpin modern society impact economic measures and social norms. This work is funded by both the National Institutes of Standards and Technology and the National Science Foundation.

EDUCATION

- Doctor of Philosophy, Operations Research, Southern Methodist University, Dallas, TX, December 2010
- Master of Science, Decision Technologies, College of Business, University of North Texas, Denton, TX, May 2001
- Bachelor of Science, Physics, University of North Texas, Denton, TX, May 1999
- Bachelor of Science, Mathematics, University of North Texas, Denton, TX, May 1999

PROFESSIONAL EXPERIENCE

2013 – present   **Associate Professor, Industrial and Systems Engineering** (Jul 2019 – present)
                     Co-appointment, Data Science and Analytics Program (Aug 2015 – present)
                     Assistant Professor, Industrial and Systems Engineering (Aug 2013 – Jun 2019)
                     Gallogly College of Engineering, University of Oklahoma

- Conduct research, teach graduate and undergraduate courses, advise and mentor PhD and MS students, obtain funding, and contribute to School, College, and University. Details below.

2008 – 2013   **Director and Founder, CN Analytics LLC, North Richland Hills, TX**

- Provided data science and analytics consulting, including statistical analysis, data mining, optimization modeling, predictive modeling, and database analytics consulting
- Recruited, coordinated, and directed efforts of analysts for CN Analytics LLC

Project Excerpts

Client: *Overseas online automobile insurance company*
Project: Proprietary longitudinal customer data consolidated with demographic and survey data to develop a market segmentation paradigm for new product introduction

Client: *Emergency Department at large urban hospital*
Project: Analysis of Emergency Department (ED) to evaluate the patient flow and the ED staffing using a simulation of the ED department based on available data.

Client: *National casual dining restaurant chain*
Project: A technical analysis of company's data, systems, partners, and technological capabilities with respect to evolving their marketing strategies and channels.

Client: *National fast-food restaurant chain*
Project: Pre-post analysis of survey responses to determine and improve customer satisfaction in menu and products.

2007 – 2013   Teaching Professor, Game and Simulation Programming,
**   College of Engineering and Information Sciences**
**   DeVry University, Irving, TX**

Simulation Modeling (GSP 281), 11 sessions: Mathematical theories and principles fundamental to development of computer simulations for study and interpretation of real phenomena.

Discrete Math (MATH 233), 12 sessions: Introduction to discrete mathematics. Topics include logic, sets, Boolean algebra, counting, probability, randomness, algorithm efficiency, and graph theory.

Math for Game Programming I and II (GSP 221/321), 25 sessions: Implementation of mathematical and physics principles in computer programming; students develop a 3D rigid body physics engine using C++.

Artificial Intelligence (GSP 315), 3 sessions: Autonomous movement, path finding, decision making, and machine learning.

Physics (PHYS 216), 12 sessions: Introduction to Newtonian and fluid mechanics; Topics include kinematics, dynamics, energy, and momentum.

2002 – 2007   Director of Consumer Analysis, Blockbuster, Dallas, TX
- Lead marketing analytics and data mining for Blockbuster's strategic marketing department and various initiatives, including: Customer Relationship Management (CRM), competitive response, and new store concepts.
- Develop and lead teams of statistical analysts, programmers and campaign managers to provide: predictive modeling, exploratory data analysis, customer segmentation, directing marketing analysis, experimental design and GIS analysis for Marketing, Product, Finance, Field and Operations departments.
- Lead the data exploration and analysis of the multi-terabytes of data on customers, prospects, retail stores, finances, and competitors in a variety of data warehouses and proprietary systems.
- Provide management with valid, data-based decision support and communicating relevant findings effectively.
- Collaborate with cross functional teams of business subject matter experts, information technology teams, and external consultants to help guide the evolution of the in-house CRM system.

2000 – 2002   Statistical Analyst, UICI (Health Markets), North Richland Hills, TX
- Create predictive models, customer profile analyses and experimental designs.
- Perform intense data and statistical analysis on large databases to evaluate and improve marketing strategies

- Design and implement multiple information system solutions leveraging Oracle and SAS on both NT and UNIX platforms.
- Direct vendor screening and selection process for large-scale information systems projects.

JOURNAL PUBLICATIONS
(student authors denoted by asterisk)

1. Tao, W, N. Wang, B. R. Ellingwood, C. Nicholson. 2020. Enhancing the performance of highway bridges following earthquakes using Markov decision processes. *Structure and Infrastructure Engineering*. DOI: 10.1080/15732479.2020.1730410

2. Pires de Lima, R.*, D. Duarte, C. Nicholson, K. J. Marfurt, R. Slatt. 2020. Petrographic microfacies classification with deep convolutional neural networks. **Accepted in** *Computers and Geosciences*.

3. Zhang, W.* and C. Nicholson. 2019. Objective scaling ensemble approach for mixed integer programming. *Journal of Heuristics.* **26**(1):1-19. DOI:10.1007/s10732-019-09418-9.

4. Beyney, C*., S. Bhavaraju*, C. Nicholson. 2019. Quantitative analysis of social media sensitivity to natural disasters. *International Journal of Disaster Reduction.* **39**(2212-4209)

5. Wendler-Bosco, V.* and C. Nicholson. 2019. Port disruption impact on the maritime supply chain: A literature review. *Sustainable and Resilient Infrastructure.* DOI: 10.1080/23789689.2019.1600961 (In-press)

6. Darayi, M., K. Barker, C. Nicholson. 2019. A multi-industry economic impact perspective on adaptive capacity planning in a freight transportation network. *International Journal of Production Economics*. **208**:356-368

7. Pires de Lima, R.*, A. Bonar, D. Duarte, K. J. Marfurt, C. Nicholson. 2019. Deep convolutional neural networks as a geological image classification tool. *The Sedimentary Record*. **17**(2):4-9.

8. Zhang, W.*, P. Lin*, N. Wang, C. Nicholson, X. Xue. 2018. Probabilistic prediction of post-disaster functionality loss of community building portfolios considering utility disruptions. *ASCE Journal of Structural Engineering, Special Issue on Structural Design and Robustness for Community Resilience to Natural Hazards*. **144**(4), 04018015.

9. Morshedlou, N.*, K. Barker, G. Sansavini, C. Nicholson. 2018. Adaptive capacity planning formulation for infrastructure networks. *Journal of Infrastructure Systems*, **24**(4): 04018022.

10. Zhang, W.*, N. Wang, C. Nicholson. 2017. Resilience-based post-disaster recovery strategies for road-bridge networks. *Structure and Infrastructure Engineering,* **13**(11):1404-1413

11. Almoghathawi, Y*., K. Barker, C.M. Rocco, and C. Nicholson. 2017. A multi-criteria decision analysis approach for importance ranking of network components. *Reliability Engineering and System Safety,* **158**: 142-151

12. Nicholson, C., L. Goodwin*, and C. Clark. 2017. Variable neighborhood search for reverse engineering of gene regulatory networks. *Journal of Biomedical Informatics,* **65**:120-131

13. Barker, K., J. Lambert, C. Zobel, A. Tapia, J. Ramirez-Marquez, L. McLay, C. Caragea, C. Nicholson. 2017. Defining resilience analytics for interdependent cyber-physical-social networks. *Sustainable and Resilient Infrastructure*, **2**(2):59-67

14. Nicholson, C., K. Barker, and J.E. Ramirez-Marquez. 2016. Flow-based vulnerability measures for network component importance: Experimentation with preparedness planning. *Reliability Engineering and System Safety*, **145**: 62-73

15. Zhang, W.* and C. Nicholson. 2016. Prediction-based relaxation solution approach for the fixed-charge network flow problem. *Computers & Industrial Engineering*, **99**:106-11

16. Nicholson, C. and W. Zhang.* 2016. Optimal network flow: A predictive analytics perspective on the fixed-charge network flow problem. *Computers & Industrial Engineering,* **99**:260-268

17. Zhang, W.* and C. Nicholson. 2016. A multi-objective optimization model for retrofit strategies to mitigate direct economic loss and population dislocation. *Sustainable and Resilient Infrastructure,* **1** (3-4):123-136

18. Kennington, J. and C. Nicholson. 2010. The uncapacitated time-space fixed-charge network flow problem: An empirical investigation of procedures for arc capacity assignment. *INFORMS Journal on Computing,* **22**: 326-337.

PUBLICATIONS UNDER REVIEW OR IN-PROGRESS
(student authors denoted by asterisk)

1. Rodríguez, A.*, M. Tehrani*, C. Nicholson, N. Wang. (2020) A data-driven framework for hazard-sensitive infrastructure component importance ranking. *Sustainable and Resilient Infrastructure.* Under review.

2. Lin, P., N. Wang, N. Rosenheim, Hu, F., C. Nicholson. (2020) A spatial-temporal predictive model for post-disaster household re-occupancy in a community. *International Journal of Disaster Risk Reduction*. Under review.

3. Wendler-Bosco V.*, C. Nicholson (2020). Modeling the economic impact of incoming tropical cyclones using machine learning. *Natural Hazards*. Under review.

4. Rodriguez, A. B. Prakash, B. Adhikari, A. González, C. Nicholson. (2020) Mapping Network States using Connectivity Queries. *ACM International Conference on Information and Knowledge Management*. Under review.

5. Zhang, W.*, C. Nicholson, N. Wang, P. Lin*, X. Xue. Interdependent networks recovery problem. In revision.

6. Beattie, M.*, C. Nicholson. Identifying heroin use correlates through conditional inference forests and Bayesian MCMC analysis. In progress.

7. Zhang, W.*, N. Wang, C. Nicholson, M. Tehrani M. A stage-wise decision framework for transportation network resilience planning and recovery. In progress.

8. Rodríguez, A.*, C. Nicholson. Data-based stochastic network mitigation. In-progress.

9. Duarte, J., P. Kirstetter, C. Nicholson. Probabilistic characterization of floods from catchment-scale precipitation moments. In-progress.

CONFERENCE PROCEEDINGS
(student authors denoted by asterisk)

1. Wen, Y.*, C. Nicholson. 2019. Simulation-based machine learning surrogate model for post-disaster road-bridge transportation network. Proceedings of the 2019 IISE Annual Conference, Orlando, FL. May 2019.
2. L. Soltanisehat*, S. Mohebbi, C. Nicholson. 2019. Vulnerability Analysis of Interdependent Critical Infrastructure Systems: Water and Transportation. Proceedings of the 2019 IISE Annual Conference, Orlando, FL. May 2019.
3. Bosco, W.* and C. Nicholson. 2019. Defining intensity levels and potential impacts of incoming hurricanes. Proceedings of the 2019 IISE Annual Conference, Orlando, FL. May 2019.
4. A. Rodriguez*, B. Adhikari, A. González, C. Nicholson. 2019. Mapping Network States using Connectivity Queries. Proceedings of the 2019 IISE Annual Conference, Orlando, FL. May 2019.
5. Rodríguez, A.*, C. Nicholson. 2018. Data-based methodology for mitigation decision-making in critical infrastructure. Proceedings of the 2018 IISE Annual Conference, Orlando, FL. May 2018.
6. Bosco, V.*, C. Nicholson. 2018. Dynamic decision models for port shutdown and ship rerouting. Proceedings of 2018 IISE Annual Conference, Orlando, FL. May 2018.
7. Nicholson, C. 2018. A hybrid machine learning and optimization modeling application for economic analysis. Proceedings of the Learning and Intelligent Optimization Conference, Kalamata, Greece. June 2018.
8. Zhang, W.*, N. Wang, C. Nicholson, M.H. Tehrani*. 2017. Stage-wised resilience planning for transportation networks. Proceedings of the 12th International Conference on Structural Safety & Reliability, Vienna, Austria. August 2017.
9. Cutler, H., C. Nicholson, N. Wang, S. Zahran. 2016. Merging economic and civil engineering models to estimate the impact of earthquakes. Proceedings of the 55th Annual Meeting of the Southern Regional Science Association, Washington, D.C. March 2016.
10. Barker, K., C. Nicholson, J. Ramirez-Marquez. 2015. Vulnerability importance measures toward resilience-based network design. Proceedings of the International Conference on Applications of Statistics and Probability in Civil Engineering, Canada. July 2015.

INVITED TALKS AND CONFERENCE PRESENTATIONS (WITHOUT PROCEEDINGS)
(student authors denoted by asterisk)

1. Bosco, V.*, C. Nicholson. 2019. Stochastic optimization methods for ship routing. Invited presentation at 2019 INFORMS Annual Meeting, November 2019.
2. Nicholson, C. 2019. Community Resilience Analysis: Joplin, MO. Invited presentation at 2019 INFORMS Annual Meeting, November 2019.
3. Nicholson, C. Big Data and Intelligent Data Analytics. Invited speaker at the 3rd Annual OU-OUHSC Biomedical Engineering Symposium: Collaborate to Cure, Oklahoma City, OK, March 29, 2019.

4. Nicholson, C., W. Zhang*, N. Wang, P. Lin*, X. Xue. 2018. Interdependent Network Functionality And Recovery For Community Resilience. Invited presentation at 2018 INFORMS Annual Meeting, November 4-7, 2018.
5. Nicholson, C. A. Rodriguez*. 2018. A Hybrid Machine Learning Approach To The Stochastic Network Design Problem For Mitigation Strategies. Invited presentation at 2018 INFORMS Annual Meeting, November 4-7, 2018.
6. Nicholson, C., H. Cutler, N. Rosenheim. 2018. Interdependent recovery modeling methods. Live webinar at Semi-Annual Meeting of the NIST-funded Center for Risk-based Community Resilience Planning, Fort Collins, CO. May 2018.
7. Nicholson C., Intelligent data analytics. OKC Innovates Big Data Symposium, Oklahoma City, OK. October 2017.
8. Nicholson, C., 2017. Information flow in recovery modeling of physical systems for Shelby County, TN. Semi-Annual Meeting of the NIST-funded Center for Risk-based Community Resilience Planning, Gaithersburg, MD. November 2017.
9. Nicholson, C. 2016. Interfacing physical, social, and economic systems for resilience decision-making. Semi-Annual Meeting of the NIST-funded Center for Risk-based Community Resilience Planning, Fort Collins, CO. April 2017.
10. Nicholson, C., 2016. System and modeling interfacing. Semi-Annual Meeting of the NIST-funded Center for Risk-based Community Resilience Planning, Gaithersburg, MD. Nov 2016.
11. Zhang, W.*, N. Wang, C. Nicholson. 2016. Resilience-based post-disaster recovery strategies for community road-bridge networks. INFORMS Annual Meeting, Nashville, TN. November 2016.
12. Zhang, W.*, C. Nicholson. 2016. A multiobjective optimization model for mitigating community economic loss and population dislocation. INFORMS Annual Meeting, Nashville, TN. November 2016.
13. Zhang, W.*, C. Nicholson. 2016. Objective scaling ensemble approach for integer linear programming. INFORMS Annual Meeting, Nashville, TN. November 2016.
14. Zhang, W.*, N. Wang, C. Nicholson. 2016. Resilience-based risk mitigation and recovery for highway transportation network. Probabilistic Mechanics & Reliability Conference 2016, Nashville, TN. May 2016.
15. Nicholson, C., 2016. Decision algorithm overview. Semi-Annual Meeting of the NIST-funded Center for Risk-based Community Resilience Planning, Fort Collins, CO. April 2016.
16. Nicholson, C. and W. Zhang*. 2015. Optimal flow analysis. INFORMS Annual Meeting, Philadelphia, PA. November 2015.
17. Zhang, W*. and C. Nicholson. 2015. Regression based relaxation. INFORMS Annual Meeting, Philadelphia, PA. November 2015.
18. Barker, K., C. Nicholson, and J.E. Ramirez-Marquez. 2014. Resilience-based importance measures for network design optimization. Industrial and Systems Engineering Research Conference, Montreal, QC. June 2014.
19. Clark, C. and C. Nicholson. 2013. Distributed parallel process particle swarm optimization on fixed charge network flow problems. INFORMS Annual Meeting, Minneapolis, MN. November 2013.

20. Nicholson, C. 2010. Generalized time-space fixed-charge network flows. INFORMS Annual Meeting. Austin, TX. November 2010.
21. Nicholson, C. 2009. Time-space fixed-charge network flows. INFORMS Annual Meeting. San Diego, CA. November 2009.

FUNDING: AWARDED

Total Awarded (Nicholson portion): $1,334,069

Machine learning enhanced COVID-19 propagation models for rural, semi-rural, and small urban regions
OU COVID-19 Rapid Response Seed Grant
Principal Investigator: 05.15.2020 to 10.31.2020
Total: $38,000; Nicholson: $12,667

RENEWAL: Center for Risk-Based Community Resilience Planning
National Institute of Standards and Technology
Submitted: March 2019
Principal Investigator: 02.01.2020 to 01.31.2025
Total: $20,000,000; OU portion: $1,011,000; Nicholson: $556,050

Center for Risk-Based Community Resilience Planning,
National Institute of Standards and Technology
Co-Principal Investigator: 02.01.2015 to 01.31.2019
Principal Investigator: 02.01.2019 to 01.31.2010
Total: $20,000,000; OU portion: $1,374,998; Nicholson: $458,332

Resilience Analytics: A Data-Driven Approach for Enhanced Interdependent Network Resilience
National Science Foundation
Critical Resilient Interdependent Infrastructure Systems and Processes Collaborative Award
Co-Principal Investigator: 10.15.2015 to 10.14.2018
Total: $2,209,129; OU portion: $534,040; Nicholson: $267,020

Data mining applications for gaming data
Nerd Kingdom
Principal Investigator: 01.15.2016 to 5.15.2017
Total: $40,000; Nicholson: $40,000

FUNDING: PENDING

Total Pending (Nicholson portion): $300,000

Data-enabled Resilient Systems
National Science Foundation

National Science Foundation Research Traineeship Program
Co-Principal Investigator: 8.15.2020 to 8.14.2025
Total: $3,000,000; Nicholson: $200,000

Artificial Intelligence for Data Fusion
The Boeing Company
Co-Principal Investigator: 6.01.2020 to 5.31.2021
Total: $399,999; Nicholson: $100,000

TEACHING ACTIVITIES, UNIVERSITY OF OKLAHOMA

SUMMARY: PhD: 1 completion, 6 current; MS ISE and DSA: 20 completions, 1 current.

GRADUATE ADVISING: Doctorate of Philosophy

INDUSTRIAL AND SYSTEMS ENGINEERING: PH.D. COMPLETED

Weili Zhang, Ph.D. Completion: December 2017
Dissertation: *Resilience-based performance modeling and decision optimization for transportation network*
2018 ISE Outstanding PhD Dissertation Award
Currently: Machine Learning Scientist at Google

INDUSTRIAL AND SYSTEMS ENGINEERING: PH.D. CURRENT

Vera Bosco; Ph.D. Candidate (2016 – Present)
Dissertation topic: *Optimization modeling for port resilience*

Sai Theja Bhavaraju; Ph.D. Candidate (2017 – Present)
Research: Text analytics and mining of social media

Yunjie Wen; Ph.D. Candidate (2017 – Present)
Research: Transportation and economic modeling and optimization during disaster scenarios

Jay McKinley; Ph.D. Student (2018 – Present)
Research: Economic gravity modeling

Jorge Duarte; Ph.D. Student (2019 – Present)
Research: Machine learning for flood/fire prediction

COLLEGE OF ENGINEERING: PH.D. CURRENT

Matthew Beattie; Ph.D. Student (2019 – Present)
Research: Machine learning for analysis and prevention of drug-addiction

GRADUATE ADVISING: Master of Science

DATA SCIENCE AND ANALYTICS: COMPLETED

Rafael de Lima Peres, Completion: December 2019
Petrographic analysis with deep convolutional neural networks

Jorge Duarte, Completion: July 2019
Probabilistic characterization of floods from catchment-scale precipitation moments

Paúl Calle, Completion: July 2019
Surrogate modeling for economic community resilience

Genwei Zhang, Completion: December 2018
Intelligent search for low-energy conformer TPP-1 polypeptide

Alex Beene, Completion: December 2018
Predictive modeling for professional basketball performance

Alexander Rodríguez, Completion: May 2018
Novel approach to component-importance for resilience decision-making

Yunjie Wen, Completion: December 2017
Game theoretic approach to resilience strategies in transportation systems

Gowtham Talluru, Completion: December 2017
Dynamic incremental response modeling

Alexandra Amidon, Completion: December 2017
Dynamic online learning strategies for neural networks

Emily Grimes, Completion: December 2017
Quantitative framework for user engagement analysis

Weili Zhang, Completion: December 2015
Optimal flow analysis, prediction, and applications

DATA SCIENCE AND ANALYTICS: CURRENT

William Keely; June 2020 - Present
TBD

INDUSTRIAL AND SYSTEMS ENGINEERING: COMPLETED

Yanbin Chang, Completion: May 2018
Optimal scheduling for transportation network recovery

Samineh Nayeri, Completion: December 2017
Decomposition algorithm for time-space fixed-charge network flow problems

Pauline Ribeyre, Completion: December 2017
Machine learning to identify characteristics of promising compounds for anticancer drug discovery

Megan Snelling, Completion: May 2017
Model for mitigating economic and social disaster damage through structural reinforcement

Param Tripathi, Completion: December 2016
Analysis of resilience in US stock markets during natural disasters

Olivia Perret, Completion: May 2016
A novel post-hoc matching procedure using statistical learning methods

Leslie Goodwin, Completion: May 2015
Divided neighborhood exploration search for inferring gene regulatory networks

Diana Wang, Completion: May 2015
Modeling approach to network performance evaluation

Cyril Beyney, Completion: May 2015
Quantitative analysis of social media sensitivity to natural disasters

COURSES

ISE/DSA 5103 – Intelligent Data Analysis
(Spring '14, Fall '14, Fall '15, Fall '16, Fall '17, Fall '18, Fall '19)

Intelligent Data Analytics is an approach to addressing real-world data intensive problems that integrates human intuition with data analysis tools to best draw out meaningful insights. Topics include problem approach and framing, data cleansing, exploratory analysis and visualization, dimension reduction, linear and logistic regression, decision trees, and clustering. Students will be introduced to a powerful open source statistical programming language (R) and work on hands-on, applied data analysis projects.

ISE 5113 Advanced Analytics and Metaheuristics
(Spring '15, Spring '16, Spring '17, Spring '18, Spring '19, Spring '20)

Advanced Analytics and Metaheuristics builds on the foundation established in Intelligent Data Analytics to explore and apply advanced techniques for addressing complex and potentially data intensive problems. Focus is on developing and employing problem solving strategies using advanced methods in the context of Data Science and Analytics. Topics include both continuous and combinatorial optimization with an emphasis on traditional techniques such as mathematical

programming as well as modern heuristics such as simulated annealing, evolutionary algorithms, and swarm optimization. Students will use programming skills to implement algorithms and solve problems.

ISE 3293/5013 Applied Engineering Statistics
(Summer '14, Fall '14, Summer '15, Fall '15, Summer '19, Summer '20)

Introduction to probability, random variates, function of random variables, expectation, discrete and continuous distributions, sampling and descriptive statistics, parameter estimation, use of statistical packages.

ISE 4113 Spreadsheet-based Decision Support Systems
(Fall '16, Fall '17, Fall '18, Fall '19)

Covers all aspects of spreadsheet-based software functionality that are relevant to supporting decision-making. Microsoft Excel is used as the subject tool. Students learn advanced functions of Excel that are available through the spreadsheet interface, the Visual Basic language and its integration with the spreadsheet environment, principles of decision-support systems studied in a variety of applications, including facility layout, warehousing, portfolio optimization, and various statistical inference problems.

MS DATA SCIENCE AND ANALYTICS PRACTICUM ADVISING

Fall 2020
- Eric Adams, TBD

Spring 2020
- Hunter Kvlegard, Recursive incremental analysis and predictive modeling
- Karl Kiam, Fraud-prevention modeling

Fall 2019
- Omaima El Boudi, Text mining of survey data to improve job training

Summer 2019
- Jianguo Liu, Prediction of financial distress using data driven models
- Lance Ensminger, Predicting professional attrition

Spring 2019
- David Robinson, Compressor failure prediction
- Dheeraj Srivathsav, Social media analytics for disaster management
- Rafael Pires de Lima, CNN modeling for petrographic analysis

Summer 2018
- Genwei Zhang, Low-energy conformer search of TPP-1 polypeptide via genetic algorithm
- Paul Contreras, Surrogate modeling and multi-objective optimization in mitigation resource allocation
- Anthony Silva, Reports and dashboards for a non-profit organization
- Andrew Duffle, Data warehouse ecosystem for KEEN customer analytics

Summer 2017
- Alexander Rodríguez, Data-based network component ranking for resilience decision-making in infrastructure systems
- Jeffrey Pelter, Identifying fraud in a near real time environment
- Alekhya Nemoori, Temporal and regional trends of oil and gas production
- Gowtham Talluru, Customer behavior simulation

Spring 2017
- Greg Flood, Excess Water Production in the Oil and Gas Industry – Detection and Diagnostics
- Emily Grimes, Effective Use of User Interaction Engagements
- Yunjie Wen, Driving Behavior Algorithm

Fall 2016
- Alexandra Amidon, Implementing CompreX to identify anomalies in databases

Fall 2015
- Weili Zhang, Predictive analytics for network flow models

UNDERGRADUATE CAPSTONE PROJECT ADVISING

2020 – Tinker AFB: "Facility design and modeling" (3 students)
2019 – Century Link: "Pulse Desktop Monitoring System: Data Analysis and Social Impacts" (4 students)
Boeing: "Agile efficiency analysis" (4 students)
2018 – Worldwide Express: "Utilizing Customer Quoting History to Perform Strategic Pricing Decisions**" (3 students)
Century Link: "Identifying customer experience needs" (3 students)
2017 – Sabre: "Analysis and definition of implementation configurations**" (2 students)
FAA: "Selection of training management software & transition process" (3 students)
2016 – Luggage with Love: "Improving Operational Efficiency" (3 students)
2014 – Sabre: "Sabre Traveler Segmentation" (3 students)
UPS: "Shipyard Movement Analysis" (3 students)

TEACHING EVALUATION SCORE SUMMARY (FALL 2014 – SPRING 2018)

On a 5-point scale for teaching evaluations, I consistently outperform the average evaluations of the School of Industrial and Systems Engineering and the Gallogly College of Engineering. An approximate weighted average of the summary evaluation scores from 2014 to 2018 is provided.

	Nicholson	School of ISE/DSA	College of Engineering
Graduate Courses	**4.623**	4.165	4.163
Undergraduate Courses	**4.392**	4.241	4.218

EDITORIAL BOARDS

2015-Present: *Journal of Sustainable and Resilience Infrastructure*

OTHER SERVICE

- Committee A (Promotion and Tenure), School of ISE, member (May 2019 – Present)
- ISE Graduate Committee, School of ISE (May 2018 – Present)
- OU Artificial Intelligence/Machine Learning Annual Symposium Lead
    - 2018: July 2018 – September 2018
    - 2019: June 2019 – September 2019
- 2019 INFORMS Annual Meeting Session Organizer: "Network Optimization for Resilience"
- 2019 IISE Annual Conference Track Organizer: Security Engineering
- Gallogly College of Engineering Vision Task Force (August 2018 – December 2018)
- ISE Director Search Committee (Sep 2017 – July 2018)
- Session Organizer and Chair 2018 IISE Annual Conference
- DSA Faculty Search Committee in 2019 and 2020 (3 positions)
- ISE Faculty Search Committee in 2014, 2016, and 2017/18
- Gallogly College of Engineering PPO Committee (Sep 2017 – May 2018)
- OU organizer and co-host for multi-university NIST-funded Center of Excellence meeting, August 31 – September 1, 2017
- Reviewer for multiple journals.

HONORS AND RECOGNITONS

- 2017 Gallogly College of Engineering Teaching Scholar Award

    During graduate and undergraduate studies
- Decision Technology Masters Academic Excellence Award; Business Computer Information Systems Honors Award; University of North Texas Master Fellowship
- University of North Texas Transfer Scholarship; National Association for the Self Employed (NASE) Academic Scholarship; University of North Texas Dean's List; Physics Scholarship

TOOLS AND SKILLS

- Statistical and Analytical Software: SAS, Enterprise Miner, SPSS, R
- Optimization: AMPL, CPLEX, Gurobi
- Database: Oracle PL/SQL, SQL, SQL*Plus, TOAD
- Simulation: ProModel, Anylogic
- Programming: Python, C++, Java, Visual Basic, VBA, UNIX Scripting

PROFESSIONAL AFFLIATIONS

- Institute for Operations Research and Management Science (INFORMS): 2009 – Present
- Institute for Industrial and Systems Engineers (IISE): 2014, 2018 – Present
- Luggage With Love, Board of Directors: 2016 (non-profit group supporting foster families)
- University of North Texas Information Technology and Decision Science Advisory Board Member: 2006-2007

PROFESSIONAL EDUCATION

- Certified Professional SAS Programmer
- SAS: Data Mining, Predictive Modeling, Neural Networks, Decision Trees, Advanced Programming
- ORACLE: Oracle SQL Optimization, PL-SQL

SPOKEN LANGUAGES

Completely fluent in English and Spanish