Maciej (Matt) Rysz

Curriculum Vitae

Department of Information Systems & Analytics
Farmer School of Business
Miami University
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AFFILIATION

- **Miami University**
  Assistant Professor, Department of Information Systems & Analytics, August 2019 – present.
- **University of Florida**
  Research Assistant Professor, Department of Industrial & Systems Engineering, April 2017 – August 2019.
- **National Research Council**
  Postdoctoral Associate, Air Force Research Laboratory, January 2015 – January 2017.
- **University of Florida**
  Postdoctoral Associate, Department of Industrial & Systems Engineering, September 2014 – January 2015.
- **University of Florida**
  Courtesy Research Assistant Professor, Department of Industrial & Systems Engineering, August 2019 – August 2022.
  Courtesy Scholar, Department of Mechanical & Aerospace Engineering, December 2016 – present.

EDUCATION

- **Ph.D. in Operations Research – Industrial Engineering**, May 2014
  University of Iowa, Iowa City, IA.
  Thesis: Risk-Averse Optimization in Networks.
- **M.S. (B.S.) in Mechanical Engineering**, May 2009
  University of Iowa, Iowa City, IA.
  Thesis: Meshfree Particle Method and Its Coupling with the Finite Element Method.

TEACHING INTERESTS

- Business Analytics
  - Mathematical Programming
  - Machine Learning
  - Business Statistics
  - Network Science & Graph Theory
- Systems Management, Architecture and Design

TEACHING EXPERIENCE

- **Instructor**
  - ISA 634: Analytics Solution Deployment, Miami University
  - ISA 225: Principles of Business Analytics, Miami University
  - ISA 321: Quantitative Analysis of Business Problems, Miami University
  - ESI 6314: Deterministic Methods in Operations Research, University of Florida

  - ESI 6553: Systems Design, University of Florida
  - ESI 6552: Systems Architecture, University of Florida
- **Teaching Assistant**
  - IE 2500: Engineering Economy & Finance, University of Iowa, January 2012/13/14 – May 2012/13/14.
  - MATH 3800: Numerical Analysis, University of Iowa, June 2007 – August 2007.
  - ENGR 2710: Dynamics, University of Iowa, August 2007 – December 2007.
- **Course Development**
  - Fully developed Analytics Solution Deployment (ISA 634) at Miami University
  - Entirely redesigned Quantitative Analysis of Business Problems (ISA 321) at Miami University
  - Redesigned Systems Design (ESI 6553) at the University of Florida
- **Teaching Evaluations Summary**

(University of Florida)
Scale of 1 to 5: 5 = highest

Course	*Semester*	*Overall Rating (Q10)*	*Department Mean*
ESI 6552	Summer 2015	4.67	4.41
ESI 6553	Fall 2017	4.50	4.32
ESI 6314	Fall 2017	4.65	4.32
ESI 6552	Spring 2018	5.00	4.25
ESI 6553	Fall 2018	4.79	4.31
ESI 6314	Fall 2018	5.00	4.31
ESI 6552	Spring 2019	4.95	4.65

(Miami University)
Scale of 1 to 4: 4 = highest

Course	*Semester*	*Overall Rating (Q9)*	*Department Mean*
ISA 321A	Fall 2019	3.67	3.12
ISA 321B	Fall 2019	3.90	3.12
ISA 225A	Spring 2020	2.82	3.25
ISA 225E	Spring 2020	3.36	3.25
ISA 321	Spring 2021	3.58	2.96
ISA 634	Spring 2021	3.13	2.96
ISA 321	Spring 2022	3.89	3.24
ISA 634	Spring 2022	3.29	3.24
ISA 321	Fall 2022	3.61	3.29
ISA 321A	Spring 2023	3.08	3.27
ISA 321B	Spring 2023	3.63	3.27
ISA 634	Spring 2023	3.27	3.27
ISA 321A	Fall 2023	3.67	3.20
ISA 321B	Fall 2023	3.92	3.20
ISA 321A	Spring 2024	3.32	3.27
ISA 634	Spring 2024	3.57	3.27

- **Awards and formal recognition for teaching**
  - Awarded the Prodese Quam Conspici Award 2022 for effort in the Mini-MBA program
  - Nominated for Outstanding Professor Awards 2021, Associated Student Government, Miami University

RESEARCH INTERESTS

- Operations research & data analytics
- Stochastic and combinatorial optimization

- Network science & graph theory
- Machine learning
- System risk management

PRIOR RESEARCH EXPERIENCE

- **Postdoctoral Appointments**
  National Research Council & University of Florida, September 2014 – January 2017.
- **Mathematical Modeling and Optimization Institute**
  University of Florida Research & Engineering Education Facility, May 2013(14) – August 2013(14).
- **Air Force Research Laboratory**
  Internship, Eglin Air Force Base, August 2012 – November 2012.
- **Air Force Office of Scientific Research Summer Fellowship Program**
  Summer program, Eglin Air Force Base, May 2011(12) – August 2011(12).

RESEARCH AWARDS

- **University Grants**
  - Data-Driven Optimization Methods for Robust and Secure Encryption of Communication Networks (proposal in preparation) (**PI**)
  - Deep Learning Navigation Applications with Synthetic Aperture Radar Data, Air Force Research Laboratory subcontract via the University of Florida, $115,712, 2021–2023. (**PI**)
    - Increased/amended grant award. Effective 7/27/2023. Increase amount: $31,859 (**PI**)
    - Increased/amended grant award. Effective 9/27/2022. Increase amount: $25,038 (**PI**)
  - Research & Scholarship Enhancement, Maimi University, Summer 2022, $10,000.
  - Deep Learning for Automatic Target Recognition using Synthetic Aperture Radar, Air Force Research Laboratory subcontract via the University of Florida, $32,333, 2020–2021. (**PI**)
  - A Multistage Stochastic Optimization Approach for Identifying Structurally Stable and Influential Clusters in Randomly Changing Networks, Air Force Research Laboratory (AFRL) – Space Vehicles Directorate, Kirtland Air Force Base, $48,000, 2021–2022. **(PI)**
  - Deep Learning for Automatic Object Recognition using Synthetic Aperture Radar, Air Force Research Laboratory, (under Contract # FA8651-08-D-0108/048), Eglin AFB, $1,049,524, 2018–2021. (**PI** – modifications made upon my departure from the University of Florida)
- **Business Grants**
  - Small Business Innovation Research (SBIR) Program, Under Topic #AF191-073, Coda Labs, LLC, Maintaining Satellite Coverage in Uncertain Operational Environments, 2019– 2020, $149,728. (**PI**)
- **Grant-based Fellowships**
  - Mathematical programming approaches for managing uncertainty in wireless networks, Munitions Directorate, RW/Advanced Guidance at Air Force Research Laboratory, Sponsor: *National Research Council of the National Academies,* 1/2016 – 1/2017.
  - Centralized Control Algorithms on a Wireless Grid (RO# 13.45.03.B7085), Munitions Directorate, RW/Advanced Guidance at Air Force Research Laboratory, Sponsor: *National Research Council of the National Academies,* 1/2015 – 1/2016.
  - Two-stage stochastic graph recourse problems, *Mathematical Modeling and Optimization Institute*, May 2014 – August 2014.
  - Risk-averse graph theoretical problems, *Mathematical Modeling and Optimization Institute*, May 2013 – August 2013.

BOOKS

- Title: Synthetic Aperture Radar (SAR) Data Applications

Editors (in order): Rysz, M., Tsokas, A., Dipple, K., Fair, K., Pardalos, P.
Publisher: Springer Optimization and Its Applications (SOIA, volume 199)
ISBN: 978-3-031-21225-3
Year Published: 2022
Book Link: SAR-DA

PUBLICATIONS

- Rysz, M., Semenov, A., (2024) A Key Distribution Technique for Wireless Sensor Networks Using Spanning Trees, *Expert Systems with Applications* (to appear)
- Semenov, A., Rysz, M., Demeyer, G., (2024) Deep Learning Approach for SAR Image Retrieval for Reliable Positioning in GPS-Challenged Environments, *IEEE Transactions on Geoscience and Remote Sensing*, vol. 62, pp. 1-11, 2024, Art no. 5106011.
- Rysz, M., (2024) An Optimization Framework for Constructing Diversified Portfolios in Market Graphs, *European Journal of Operational Research* (under review)
- Rysz, M., Mehta, S., (2024) A Simplicial Homology Approach for Improving Wireless Sensor Network Performance in Crop Management, *European Journal of Operational Research* (under review)
- Dolaeva, A., Rysz, M., Grigoriev, D., Semenov, A., (2024) Analyzing and forecasting P/E ratios using investor sentiment in panel data regression and LSTM models, *International Review of Economics & Finance*, (under review)
- Rysz, M., Semenov, A., Xu, G., (2023) A Two-Stage Stochastic Programming Approach for the Key Management q-Composite Scheme, Handbook of Trustworthy Federated Learning (Editors: M. T. Thai, H. N. Phan, B. Thuraisingham), Springer Cham, ISBN 978-3-031-58922-5.
- Eshghali, M., Rysz, M., Krokhmal, P., (2023) Stochastic and Risk Averse Maximum Subgraph Problems, Encyclopedia of Optimization, 2nd Edition (Editors: P. Pardalos and O. Prokopyev), Springer.
- Semenov, A., Pandey, G., Rysz, M., Xu, G., (2022) Diversity in Contextual Bandit News Recommendations, *Expert Systems with Applications*, 195:116478.
- Tsokas, A., Rysz, M., Dipple, K, Pardalos, P., (2022) SAR Data Applications in Earth Observation: an Overview, *Expert Systems with Applications*, 205:117342.
- Semenov, A., Rysz, M., Demeyer, G., (2022) Synthetic Aperture Radar Image Based Navigation Using Siamese Neural Networks, Synthetic Aperture Radar (SAR) Data Applications (Editors: M. Rysz, A. Tsokas, K. Dipple, K. Fair, P. Pardalos), Springer, Pages: 79-89, ISBN: 978-3-031-21225-3.
- Park, S., Rysz, M., Dipple, K. M., Pardalos, M., (2022) Homography Augmented Momentum Contrastive Learning for SAR Image Retrieval, Synthetic Aperture Radar (SAR) Data Applications (Editors: M. Rysz, A. Tsokas, K. Dipple, K. Fair, P. Pardalos), Springer, Pages: 63-78, ISBN: 978-3-031-21225-3.
- Rysz, M., Mehta, S., (2021) A Risk-Averse Optimization Approach to Human-Robot Collaboration in Robotic Fruit Harvesting, *Computers and Electronics in Agriculture*, 182:106018.
- Park, S., Rysz, M., Fair, K., Pardalos, P., (2021) SAR Image-based Positioning in GPS-denied Environments using Deep Cosine Similarity Neural Networks, *Inverse Problems & Imaging*, 15(4):763-785.
- S. S. Mehta and M. Rysz, (2021) Control Techniques in Robotic Harvesting, Fundamentals of Agricultural and Field Robotics, Editors: Manoj Karkee and Qin Zhang, *Springer International Publishing*, ISBN 978-3-030-70399-8.
- Xu, G., Semenov, A., Rysz, M. (2020), An integer programming approach for the key management problem in wireless sensor networks, *Optimization Letters*, 14(5):1037 - 1051.
- Mehta, S., Rysz, M., Ganesh, R., Burks, T., (2020) Finite-time Visual Servo Control for Robotic Fruit Harvesting in the Presence of Fruit Motion, ASABE Annual International Virtual Meeting, Paper No. 1250, St. Joseph, MI: ASABE.
- Rysz, M., Mehta, S., (2019) A two-stage stochastic optimization approach for detecting structurally stable clusters in random graphs, *IEEE Transactions on Network Science and Engineering*, 6(4), 671-683.
- Mehta, S.S., Ton, C., Rysz, M., Kan, Z., E. A. Doucette, J. W. Curtis, (2019) A new approach to visual servo

control using terminal constraints, *Journal of the Franklin Institute*, 356(10): 5001-5026.

- Rysz, M., Burks, T., Mehta, S., Ganesh, P., (2019) Risk-averse Optimization for Improving Harvesting Efficiency of Autonomous Systems through Human Collaboration, *AgriControl 2019, 6th IFAC Conference on Sensing, Control and Automation Technologies for Agriculture*, December 4-6, 2019, Sydney, Australia (Paper ID: 25, Regular Paper).
- Mehta, S., Ton, C., Rysz, M., Ganesh, P., Kan, Z., Burks, T., (2019) On Achieving Bounded Harvest Times in Robotic Fruit Harvesting: A Finite-Time Visual Servo Control Approach, *AgriControl 2019, 6th IFAC Conference on Sensing, Control and Automation Technologies for Agriculture*, December 4-6, 2019, Sydney, Australia (Paper ID: 23, Regular Paper).
- Rysz, M., Pajouh, F., (2018) Finding Cliques with the highest betweenness centrality, *European Journal of Operational Research*, 271(1): 155-164.
- Rysz, M., Krokhmal, P., and E. L. Pasiliao (2017) Detecting resilient structures in stochastic networks: A two-stage stochastic optimization approach, *Networks*, 69(2), 189-204.
- Rysz, M., Pajouh, F., Krokhmal, P., and E. L. Pasiliao (2016) Identifying risk-averse low-diameter clusters in graphs with stochastic vertex weights,*Annals of Operations Research*, 262(1): 89-108.
- Rysz, M., Vinel, A., Krokhmal, P., Pasiliao, E. L., (2015) A scenario decomposition algorithm for stochastic programming problems with a class of downside risk measures, *INFORMS Journal on Computing*, 27(2): 416-430.
- Rysz, M., Mirghorbani, M., Krokhmal, P., Pasiliao, E. L., (2014) On risk-averse maximum weighted subgraph problems, *Journal of Combinatorial Optimization*, 28(1): 167-185.
- Rysz, M., Pajouh, F., Krokhmal, P., Pasiliao. E.L., (2014) On risk-averse weighted k-club problems, Examining Robustness and Vulnerability of Critical Infrastructure Networks, *NATO Science for Peace and Security Series - D: Information and Communication Security*, 37: 231-242.
- Lovanh, N., Quintanar, A., Rysz, M., Loughrin, J., Mahmood, R., (2014) Effect of Heat Fluxes on Ammonia Emission from Swine Waste Lagoon Based on Neural Network Analyses, *Journal of Environmental Science and Technology*, 7(1): 16-29.
- Rysz, M., Krokhmal, P., and Pasiliao, E.L., (2013) Minimum risk maximum clique problem, Dynamics of Information Systems: Algorithmic Approaches, *Springer Proceedings in Mathematics & Statistics*, 51: 251-267.
- Xiao, S., Wang, S., Ni, J., Briggs, R., Rysz, M., (2008) Reliability Analysis of Carbon Nanotubes Using Molecular Dynamics with the Aid of Grid Computing, *Journal of Computational and Theoretical Nanoscience*, 5(4): 528-534.

- **Manuscripts in preparation**
  1. On finding optimal sets for achieving control in leader-follower networks.
  2. A transformer neural network approach for navigation using synthetic aperture radar data.
  3. A combinatorial algorithm for efficient cryptographic key distribution and redistribution in communication networks subject to random sensor failures.

INVITED PRESENTATIONS & WORKSHOPS

- Rysz, M., Reducing Encryption Complexity Of Maximum Key Assignments In Sensor Networks Using Spanning Tree, INFORMS Annual Meeting 2023, Phoenix, AZ, USA, October 15-18, 2023.
- Rysz, M., Semenov, A., A Fast Algorithm for the q-Composite Key Management Problem, *INFORMS Annual Meeting*, Indianapolis, USA, October 16-19, 2022.
- Rysz, M., A two-stage stochastic optimization approach for detecting structurally stable clusters in random graphs, T*he 22nd Conference of International Federation of Operational Research Societies (IFORS),* August 23-27, 2021, Hanyand University, Seoul, South Korea.
- Semenov A., Rysz, M., Panday, G., Xu, G., Diversity in News Recommendations using Contextual Bandits, 1*4th International Conference and Financial Econometrics* (CFE 2020), December 19-21, 2020.

- M. Rysz, G. Xu, A. Semenov, An integer programming approach for the key management problem in wireless sensor networks, *INFORMS Annual Meeting*, October 20-23, 2019, Seattle, Washington.
- Ganesh, P., Rysz, M., Burks, T., Mehta, S., Risk-averse Optimization for Improving Harvesting Efficiency of Autonomous Systems through Human Collaboration, *AgriControl 2019*, December 4-6, 2019, Sydney, Australia.
- Ganesh, P., Mehta, S., Ton, C., Rysz, M., Kan, Z., Burks, T., On Achieving Bounded Harvest Times in Robotic Fruit Harvesting: A Finite-Time Visual Servo Control Approach, *AgriControl 2019*, December 4-6, 2019, Sydney, Australia.
- Workshop on Recent Themes in Resource Tradeoffs: Privacy, Fairness and Robustness, Institute for Mathematics and its Applications, University of Minnesota, June 17-21, 2019.
- M. Rysz, Identifying Resilient Clusters in Networks with Randomly Changing Topology, *INFORMS Annual Meeting*, November 4-7, 2018, Phoenix, Arizona.
- M. Rysz, An overview on Network Optimization and Data Science, Mechanical Engineering Advisory Board, University of Florida, November 16, 2018.
- M. Rysz, Risk management and optimization in networks, Air Force Research Laboratory – Space Vehicles Directorate, Kirtland AFB, July 31, 2018.
- M. Rysz, On subgraph detection models. AFOSR Program Officers visit to Air Force Research Laboratory – Munitions Directorate, Eglin AFB, March 29, 2018.
- M. Rysz, University of Florida Analytics Initiative. *Range Commanders Council – Data Sciences Group Meeting*, October 17-18, 2017, Redstone Arsenal, Huntsville, Alabama.
- University of Florida, Department of Industrial and Systems Engineering, Detecting central clusters in networks, *Seminar*, February 21, 2017, Gainesville, Florida.
- M. Rysz, F.M. Pajouh, Detecting central clusters in networks, *INFORMS Annual Meeting*, November 13-16, 2016, Nashville, Tennessee.
- M. Rysz, E.L. Pasiliao, A fast algorithm for detecting subgraphs using betweenness centrality measures, *Mathematical Modeling and Optimization Institute 4^{th} Annual Meeting*, July 25-29, 2016, Shalimar, Florida.
- University of Florida Seminar, Department of Industrial and Systems Engineering, Identifying resilient structures in networks: a two-stage stochastic programming approach, *Seminar*, April 28, 2016, Gainesville, Florida.
- M. Rysz, F.M. Pajouh, P. Krokhmal, E.L. Pasiliao, Identifying risk-averse low-diameter clusters in networks with stochastic vertex weights, *INFORMS Annual Meeting*, November 1-4, 2015, Philadelphia, Pennsylvania.
- M. Rysz, P. Krokhmal, E.L. Pasiliao, A scenario decomposition algorithm for stochastic programming problems with a class of downside risk measures, *22^{nd} International Symposium on Mathematical Programming*, July 12-17, 2015, Pittsburgh, Pennsylvania.
- M. Rysz, P. Krokhmal, E.L. Pasiliao, A scenario decomposition algorithm for stochastic programming problems with a class of downside risk measures, *Mathematical Modeling and Optimization Institute 3^{rd} Annual Meeting*, July 27-31, 2015, Shalimar, Florida.
- M. Rysz, P. Krokhmal, E.L. Pasiliao, Two-stage stochastic maximum subgraph problems, *World Conference on Global Optimization*, February 22-25, 2015, Gainesville, Florida.
- M. Rysz, P. Krokhmal, E.L. Pasiliao, Two-stage stochastic maximum subgraph problems, *INFORMS Annual Meeting*, November 9-12, 2014, San Francisco, California.
- M. Rysz, P. Krokhmal, E.L. Pasiliao, A scenario decomposition approach for solving optimization problems with coherent risk measures, *INFORMS Annual Meeting*, October 6-9, 2013, Minneapolis, Minnesota.
- M. Rysz, P. Krokhmal, E.L. Pasiliao , A scenario decomposition approach for solving optimization problems with coherent risk measures, *1^{st} Annual Meeting of the AFRL Mathematical Modeling and Optimization Institute*, July 29 - August 1, 2013, Shalimar, Florida.
- M.Rysz, S. Xiao, A Temperature-related Homogenization Technique for Nanoscale Continuum Approximation, *Society of Engineering Science, 45^{th} Annual Technical Meeting*, October 12-15, 2008, Urbana-

Champaign, Illinois.

PROFESSIONAL SERVICES & MEMBERSHIPS

- Reviewer:
  - Book reviewer for Springer
  - Decision Science
  - INFORMS Journal on Applied Analytics
  - IEEE Transactions on Network Service & Management
  - International Review of Financial Analysis
  - Computational Optimization & Applications
  - Journal of Global Optimization
  - Journal of Combinatorial Optimization
  - Optimization Letters
  - Networks
  - Expert Systems with Applications
  - Energy Systems
- Committee member services:
  - Miami University Graduate Council Committee, Fall 2024 – present.
  - Farmer School of Business Graduate Studies Committee, Fall 2023 – present.
  - MSBA Admissions Committee, Farmer School of Business, Summer 2023 – present.
  - Dean's Faculty Advisory Committee, Miami University, Fall 2021 – Spring 2022.
  - Seminar Organization Committee, Department of Information Systems & Analytics, Miami University, Spring 2020 – present.
  - Department of Mechanical and Aerospace Engineering, University of Florida – June 2018.
  - Department of Mechanical and Aerospace Engineering, University of Florida – April 2018.
- Institute for Operations Research and the Management Sciences (INFORMS)
- IEEE Aerospace and Electronic Systems Society (AESS)
- IEEE Communications Society (ComSoc)

MISCELLANEOUS

- Languages: English, Spanish, Polish, German(basic)