# Balabhaskar Balasundaram | CV

322 Engineering North – Stillwater, OK 74078 – USA

✉ baski@okstate.edu • baski.me • baski363 • baski363

*Last updated: July 3, 2024*

## Appointments

**School of Industrial Engineering & Management** — **Oklahoma State University**

| | |
|---|---|
| *Professor* | *July 2020–Present* |
| *Wilson Bentley Professorship* | *July 2018–Present* |
| *Associate Professor* | *July 2013–June 2020* |
| *Graduate Program Director* | *July 2016–June 2019* |
| *Assistant Professor* | *August 2007–June 2013* |

## Education

**Texas A&M University**
*Ph.D., Industrial Engineering* — *2002–2007*

**Indian Institute of Technology–Madras**
*B.Tech., Mechanical Engineering* — *1998–2002*

## Research Interests

**Optimization theory and algorithms**: Graph signatures; Graph-theoretic clique relaxations; Fault-tolerant cluster detection; Design of survivable (multi-path, disruption-tolerant) network topologies; Network interdiction

**Optimization applications**: Computational biology; Agricultural analytics; Social network analysis; Graph-based data mining; Transportation logistics; Production planning

## Publications

Student coauthors are starred*

### Under Review

[1] Hao Pan*, Balabhaskar Balasundaram, and Juan S. Borrero. Finding conserved low-diameter subgraphs in social and biological networks. *Under Review*, 2024.

[2] Parisa Vaghfi Mohebbi*, Yajun Lu, Zhuqi Miao, Balabhaskar Balasundaram, Pankush Kalgotra, and Ramesh Sharda. Identifying most lethal cliques in disease comorbidity graphs. *Under Review*, 2024.

## Accepted

[3] Pouya Ahadi*, Balabhaskar Balasundaram, Juan S. Borrero, and Charles Chen. Development and optimization of expected cross value for mate selection problems. *Heredity*, July 2024. https://doi.org/10.1038/s41437-024-00697-y.

[4] Niloufar Daemi*, Juan S. Borrero, and Balabhaskar Balasundaram. First passage time interdiction in Markov chains. *Operations Research Letters*, 2024. https://doi.org/10.1016/j.orl.2024.107111.

## Journal Articles

[5] Yajun Lu, Zhuqi Miao, Parisa Sahraeian*, and Balabhaskar Balasundaram. On atomic cliques in temporal graphs. *Optimization Letters*, 17(4):813–828, April 2023.

[6] Yajun Lu*, Hosseinali Salemi*, Balabhaskar Balasundaram, and Austin Buchanan. On fault-tolerant low-diameter clusters in graphs. *INFORMS Journal on Computing*, 34(6):3181–3199, November-December 2022.

[7] Niloufar Daemi*, Juan S. Borrero, and Balabhaskar Balasundaram. Interdicting low-diameter cohesive subgroups in large-scale social networks. *INFORMS Journal on Optimization*, 4(3):304–325, September 2022.

[8] Balabhaskar Balasundaram, Juan S. Borrero, and Hao Pan*. Graph signatures: Identification and optimization. *European Journal of Operational Research*, 296(3):764–775, February 2022.

[9] Babak Farmanesh*, Arash Pourhabib, Balabhaskar Balasundaram, and Austin Buchanan. A Bayesian framework for functional calibration of expensive computational models through non-isometric matching. *IISE Transactions*, 53(3):352–364, March 2021.

[10] Zhuqi Miao* and Balabhaskar Balasundaram. An ellipsoidal bounding scheme for the quasi-clique number of a graph. *INFORMS Journal on Computing*, 32(3):763–778, August 2020.

[11] Farzaneh Nasirian*, Foad Mahdavi Pajouh, and Balabhaskar Balasundaram. Detecting a most closeness-central clique in complex networks. *European Journal of Operational Research*, 283(2):461–475, June 2020.

[12] Juan Ma* and Balabhaskar Balasundaram. On the chance-constrained minimum spanning $k$-core problem. *Journal of Global Optimization*, 74(4):783–801, August 2019.

[13] Shuzhen Sun*, Zhuqi Miao*, Blaise Ratcliffe, Polly Campbell, Bret Pasch, Yousry A. El-Kassaby, Balabhaskar Balasundaram, and Charles Chen. SNP variable selection by generalized graph domination. *PLoS ONE*, 14(1):1–18, January 2019.

[14] Yajun Lu*, Esmaeel Moradi*, and Balabhaskar Balasundaram. Correction to: Finding a maximum $k$-club using the $k$-clique formulation and canonical hypercube cuts. *Optimization Letters*, 12(8):1959–1969, November 2018.

[15] Esmaeel Moradi* and Balabhaskar Balasundaram. Finding a maximum $k$-club using the $k$-clique formulation and canonical hypercube cuts. *Optimization Letters*, 12(8):1947–1957, November 2018.

[16] Zhuqi Miao*, and Balabhaskar Balasundaram. Approaches for finding cohesive subgroups in large-scale social networks via maximum $k$-plex detection. *Networks*, 69(4):388–407, July 2017.

[17] Foad Mahdavi Pajouh*, Esmaeel Moradi*, and Balabhaskar Balasundaram. Detecting large risk-averse 2-clubs in graphs with random edge failures. *Annals of Operations Research*, 249(1):55–73, February 2017.

[18] Foad Mahdavi Pajouh*, Balabhaskar Balasundaram, and Illya V. Hicks. On the 2-club polytope of graphs. *Operations Research*, 64(6):1466–1481, November-December 2016.

[19] Juan Ma*, Foad Mahdavi Pajouh*, Balabhaskar Balasundaram, and Vladimir Boginski. The minimum spanning $k$-core problem with bounded CVaR under probabilistic edge failures. *INFORMS Journal on Computing*, 28(2):295–307, April 2016.

[20] Zhuqi Miao*, Balabhaskar Balasundaram, and Eduardo L. Pasiliao. An exact algorithm for the maximum probabilistic clique problem. *Journal of Combinatorial Optimization*, 28(1):105–120, July 2014.

[21] Foad Mahdavi Pajouh*, Zhuqi Miao*, and Balabhaskar Balasundaram. A branch-and-bound approach for maximum quasi-cliques. *Annals of Operations Research*, 216(1):145–161, May 2014.

[22] Svyatoslav Trukhanov, Chitra Balasubramaniam, Balabhaskar Balasundaram, and Sergiy Butenko. Algorithms for detecting optimal hereditary structures in graphs, with application to clique relaxations. *Computational Optimization and Applications*, 56(1):113–130, September 2013.

[23] Sergiy Butenko, Oleksandra Yezerska, and Balabhaskar Balasundaram. Variable objective search. *Journal of Heuristics*, 19(4):697–709, August 2013.

[24] Foad Mahdavi Pajouh*, Balabhaskar Balasundaram, and Oleg A. Prokopyev. On characterization of maximal independent sets via quadratic optimization. *Journal of Heuristics*, 19(4):629–644, August 2013.

[25] Marco Carvalho, Alexey Sorokin, Vladimir Boginski, and Balabhaskar Balasundaram. Topology design for on-demand dual-path routing in wireless networks. *Optimization Letters*, 7(4):695–707, April 2013.

[26] Foad Mahdavi Pajouh*, Dahai Xing*, Yingjue Zhou*, Sharethram Hariharan*, Balabhaskar Balasundaram, Tieming Liu, and Ramesh Sharda. A specialty steel bar company uses analytics to determine available-to-promise dates. *INFORMS Journal on Applied Analytics*, 43(6):503–517, 2013.

[27] Foad Mahdavi Pajouh* and Balabhaskar Balasundaram. On inclusionwise maximal and maximum cardinality $k$-clubs in graphs. *Discrete Optimization*, 9(2):84–97, May 2012.

[28] Trevor Grout*, Yang Hong, Jeffrey Basara, Balabhaskar Balasundaram, Zhenyu Kong, and Satish T. S. Bukkapatnam. Significant winter weather events and associated socioeconomic impacts (federal aid expenditures) across Oklahoma: 2000-2010. *Weather, Climate, and Society*, 4(1):48–58, January 2012.

[29] Balabhaskar Balasundaram, Sergiy Butenko, and Illya V. Hicks. Clique relaxations in social network analysis: The maximum $k$-plex problem. *Operations Research*, 59(1):133–142, January-February 2011.

[30] Balabhaskar Balasundaram, Shyam S. Chandramouli*, and Svyatoslav Trukhanov. Approximation algorithms for finding and partitioning unit-disk graphs into co-$k$-plexes. *Optimization Letters*, 4(3):311–320, August 2010.

[31] Balabhaskar Balasundaram and Sergiy Butenko. On a polynomial fractional formulation for independence number of a graph. *Journal of Global Optimization*, 35(3):405–421, July 2006.

[32] Balabhaskar Balasundaram and Sergiy Butenko. Constructing test functions for global optimization using continuous formulations of graph problems. *Journal of Optimization Methods and Software*, 20(4-5):439–452, August-October 2005.

[33] Balabhaskar Balasundaram, Sergiy Butenko, and Svyatoslav Trukhanov. Novel approaches for analyzing biological networks. *Journal of Combinatorial Optimization*, 10(1):23–39, August 2005.

## Book Chapters

[34] Balabhaskar Balasundaram and Foad Mahdavi Pajouh*. Graph theoretic clique relaxations and applications. In P. M. Pardalos, D.-Z. Du, and R. Graham, editors, *Handbook of Combinatorial Optimization*, pages 1559–1598. Springer, New York, 2nd edition, 2013.

[35] Foad Mahdavi Pajouh* and Balabhaskar Balasundaram. Gradient-type methods. In J. J. Cochran, L. A. Cox, P. Keskinocak, J. P. Kharoufeh, and J. C. Smith, editors, *Wiley Encyclopedia of Operations Research and Management Science*, volume 3, pages 2092–2099. John Wiley & Sons, Inc., 2011.

[36] Balabhaskar Balasundaram and Sergiy Butenko. Optimization problems in unit-disk graphs. In C. A. Floudas and P. M. Pardalos, editors, *Encyclopedia of Optimization*, pages 2832–2844. Springer Science + Business Media, New York, 2nd edition, 2009.

[37] Balabhaskar Balasundaram and Sergiy Butenko. Network clustering. In B. H. Junker and F. Schreiber, editors, *Analysis of Biological Networks*, pages 113–138. Wiley, New York, 2008.

[38] Balabhaskar Balasundaram and Sergiy Butenko. Graph domination, coloring and cliques in telecommunications. In M. G. C. Resende and P. M. Pardalos, editors, *Handbook of Optimization in Telecommunications*, pages 865–890. Springer Science + Business Media, New York, 2006.

## Conference Proceedings

[39] Hao Pan*, Balabhaskar Balasundaram, and Juan S. Borrero. A decomposition branch-and-cut algorithm for the maximum cross-graph $k$-club problem. In *Proceedings of the 10th International Network Optimization Conference (INOC)*, pages 17–22. Open Proceedings, 2022.

[40] Juan Ma* and Balabhaskar Balasundaram. Solving chance-constrained spanning $k$-core problem via decomposition and integer programming. In *Proceedings of the 2013 Industrial and Systems Engineering Research Conference (ISERC 2013)*, pages 2774–2783, Norcross, GA, 2013. Institute of Industrial Engineers.

[41] Zhuqi Miao* and Balabhaskar Balasundaram. Cluster detection in large-scale social networks using $k$-plexes. In *Proceedings of the 2012 Industrial and Systems Engineering Research Conference (ISERC 2012)*, pages 1–10, Norcross, GA, 2012. Institute of Industrial Engineers.

[42] Peerapol Sittivijan*, Manjunath Kamath, and Balabhaskar Balasundaram. Models for clustering commodities into logistical families. In *Proceedings of the 2009 International Conference on Value Chain Sustainability (ICOVACS 2009)*, pages 32–37, 2009.

[43] Balabhaskar Balasundaram. Cohesive subgroup model for graph-based text mining. In *Proceedings of the 2008 IEEE International Conference on Automation Science and Engineering (CASE 2008)*, pages 989–994. IEEE, August 2008.

[44] G. Srinivasan, B. Balasundaram, and V. Karthik. Minimizing squared deviation of completion times about a common due date - algorithms and heuristics. In P. Radhakrishnan, S. Palaniswami, P. V. Mohanram, and J. Kanchana, editors, *Proceedings of the Ist International Conference on Logistics and Supply Chain Management*, pages 234–239, Mumbai, August 2001. Allied Publishers.

## Awards & Honors

- *Regents Distinguished Teaching Award,* Oklahoma State University, September 2022.
- *Phoenix Award for Outstanding Faculty,* Graduate and Professional Student Government Association, Oklahoma State University, April 2019.
- *Regents Distinguished Research Award,* Oklahoma State University, November 2016.
- *Research Excellence Award,* College of Engineering Architecture and Technology, Oklahoma State University, April 2016.
- *IISE Award for Excellence in the Teaching of Operations Research*, Operations Research Division, Institute of Industrial and Systems Engineers, May 2015.
- *Research Excellence Award,* College of Engineering Architecture and Technology, Oklahoma State University, April 2014.
- *President's Cup for Creative Interdisciplinarity, First Place*, member of *i*CREST Center for Bioinformatics and Computational Biology (team leader Dr. Rakesh Kaundal), Oklahoma State University, December 2013.
- *OSU Award of Excellence for Advising*, Oklahoma State University, December 2013.
- *IEM Faculty Award*, School of Industrial Engineering & Management, Oklahoma State University, November 2013.
- *ISERC Best Paper Award (Operations Research Track)* from the IIE Operations Research Division for the paper titled "Solving chance-constrained spanning $k$-core problem via decomposition and integer programming," coauthored with doctoral advisee Juan Ma, May 2013.
- *Outstanding Young Faculty Award*, Halliburton Foundation, Inc., College of Engineering Architecture and Technology, Oklahoma State University, March 2013.

- *CEAT Outstanding Advisor Award*, College of Engineering Architecture and Technology, Oklahoma State University, December 2012.
- *IIE South Central Region Outstanding Advisor Award*, Institute of Industrial Engineers, May 2011.
- *Pritsker Doctoral Dissertation Award, 2nd Place*, Institute of Industrial Engineers, May 2008.
- *George Kunze Prize*, Texas A&M University, April 2007.
- *U.S. Senator Phil Gramm Doctoral Fellowship*, Texas A&M University, April 2007.
- *Distinguished Graduate Student Award for Excellence in Teaching*, Association of Former Students of Texas A&M University, March 2007.
- *Best Poster Award* for "Constructing test functions for global optimization using continuous formulations of optimization problems on graphs" in the *Workshop on Multiscale Optimization Methods and Applications*, February 26-28, 2004, University of Florida, Gainesville, FL.
- *Best Paper Award* for "A backtracking heuristic for solving U-shaped assembly line balancing problem" in *Shaastra TechFest 2002*, Indian Institute of Technology–Madras, India. (With P. Devarajan).

## Grants

### Principal Investigator/Institutional Lead

- *FLAT: Freight Lane Assignment Tool,* PI: Balasundaram, Co-PIs: Buchanan, Heragu, 1/13/2020–8/16/2020, $163,730. *TreeHouse Foods, Inc.*
- *Optimization-based Aggregate Master Planning Tools for Bay Valley Foods, LLC,* PI: Balasundaram, Co-PIs: Buchanan, Heragu, 10/1/2017–1/31/2020, $250,599. *Bay Valley Foods, LLC.*
- *Collaborative Research: Risk-Averse Cluster Detection in Network Models of Big Data Under Measurement Uncertainty*, OSU PI: Balasundaram, Collaborator: Hicks (Rice University), 4/15/2014–3/31/2018, $271,649. *National Science Foundation*.
- *Clique Relaxations in Biological and Social Network Analysis: Foundations and Algorithms*, PI: Butenko (Texas A&M), Co-PIs: Balasundaram, Boginski (University of Florida), 7/1/2012–6/30/2015, $452,942. *Air Force Office of Scientific Research*.
- *Robust Optimization for Connectivity and Flows in Dynamic Complex Networks*, PI: Balasundaram, Co-PIs: Butenko (Texas A&M), Boginski, Uryasev (University of Florida), 9/15/2009–9/14/2013, $589,092. *Department of Energy*.
- *Data Reduction by Generalized Graph Domination*, PI: Balasundaram, 2/1/2010–7/31/2010, $35,558. *Entero Technologies LLC.*
- *Proactive Approach To Transportation Resource Allocation Under Severe Winter Weather Emergencies*, PI: Balasundaram, Co-PIs: Bukkapatnam, Kong, Hong (University of Oklahoma), 7/1/2009–6/30/2011, $261,194. *Oklahoma Transportation Center*.

### Co-Principal Investigator

- *MRI: Acquisition of Shared High Performance Compute Cluster for Multidisciplinary Computational and Data-Intensive Research*, PI: Brunson, Co-PIs: Balasundaram, Borunda, Fennell, Hoyt, 10/1/2015–9/30/2018, $951,570. *National Science Foundation*.
- *Feasibility Study: Hazardous Material Movement Model for HazMat Transportation in Oklahoma*, PI: Pourhabib, Co-PIs: Balasundaram, Kamath, Zhao, 7/1/2015–9/30/2015, $44,534. *Oklahoma Emergency Management*.
- *Algorithms for Order-Picking (Project 12), RFID Technology Center at the University of Louisville*, PI: Heragu, Co-PIs: Balasundaram, Kamath, Liu, 1/1/2014–3/28/2014, $235,270. *Defense Logistics Agency*.
- *Oklahoma Center for Transportation and Logistics Research, Education and Outreach*, PI: Ingalls, Co-PIs: Balasundaram, Kamath, Liu, 7/1/2011–6/30/2013, $150,000. *Oklahoma Transportation Center*.
- *Collaborative: CELDi (Center for Engineering Logistics and Distribution) Research Experience for Teachers Supplement*, PI: Kamath, Co-PIs: Balasundaram, Ingalls, 12/18/08–7/31/13, $58,000. *National Science Foundation*.
- *Collaborative: CELDi (Center for Engineering Logistics and Distribution) Renewal*, PI: Kamath, Co-PIs: Balasundaram, Ingalls, 8/1/07–7/31/13, $125,000. *National Science Foundation*.
- *Developing Cutting-Edge Educational, Outreach and Diversity Programs in Transportation and Logistics for Oklahoma*, PI: Kamath, Co-PIs: Balasundaram, Ingalls, Liu, 10/1/2011–12/31/2012, $87,465. *Oklahoma Transportation Center.*
- *ECLIPSE: Environment for Contextualized Learning and Insightful Problem Solving Experiences*, PI: Antonenko, Co-PIs: Balasundaram, Gelder, Greenwood, Nichols, 9/1/2011–8/31/2012, $49,281. *Oklahoma State University Planning Grants.*
- *Development of an Available-To-Promise Decision Support System for Webco Industries*, PI: Liu, Co-PI: Balasundaram, 4/1/2010–6/30/2012, $137,995. *Webco Industries Inc.*
- *A Design Optimization Tool for Supply Chains (DOTS)*, PI: Ingalls, Co-PIs: Kamath, Balasundaram, 6/1/2010–12/31/2011, $21,666. *Center for Excellence in Logistics and Distribution (NSF I/UCRC)*.
- *Acquisition of LIDAR Laser Scanner for Bridge Inspection*, PI: Kong, Co-PIs: Ley, Emerson, Balasundaram, Collins, Liu, 8/1/2010–10/31/2011, $200,000. *Oklahoma Transportation Center*.

## Graduate Advising

### Doctoral Students

- Shuai Shao (Co-advisor, in progress)
- Parisa V. Mohebbi (in progress)
- Hao Pan (December 2021)
  - Dissertation: *Mining Low-Diameter Clusters Conserved in Graph Collections*

- Business Development, Yantai Junheng Construction Machinery, Yantai, Shandong, China

- Yajun Lu (July 2019)
  - Dissertation: *Finding Second-order Clubs*.
  - Assistant Professor of Operations Management, Department of Management & Marketing, College of Business & Industry, Jacksonville State University.
- Babak Farmanesh (Co-advisor, August 2018)
  - Dissertation: *Efficient Techniques for Statistical Modeling of Calibration and Spatio-temporal Systems Using Gaussian Processes*.
  - Senior Data Scientist at Microsoft.
- Zhuqi Miao (May 2016)
  - Dissertation: *Combinatorial and Global Optimization Approaches to the Maximum Quasi-clique Problem*.
  - Assistant Professor of Business Analytics, School of Business, State University of New York at New Paltz.
- Esmaeel Moradi (May 2016)
  - Dissertation: *Decomposition Algorithms for Detecting Low-diameter Clusters in Graphs*.
  - Director of Global Supply Chain Strategy at Wesco
- Juan Ma (Co-advisor, December 2015)
  - Dissertation: *Proactive Approaches for System Design Under Uncertainty Applied to Network Synthesis and Capacity Planning*.
  - Technical Manager, Data Science, iHeartMedia, Inc.
- Foad Mahdavi Pajouh (August 2012)
  - Dissertation: *Polyhedral Combinatorics, Complexity & Algorithms for $k$-Clubs in Graphs*.
  - Jack Howe Fellow and Associate Professor, School of Business, Stevens Institute of Technology

### Masters Students

- Jithender Kakumanu (Spring 2023)
- Varun Joshi (Spring 2023)
- Parisa Sahraeian (Summer 2022)
- Pouya Ahadi (Spring 2021), Thesis: *Optimizing Expected Cross Value for Genetic Introgression*
- Tyler Davis (Fall 2017), Thesis: *Parallelization of the Clark, Colbourn, and Johnson Maximum Clique Algorithm for Unit Disk Graphs*
- Rajeev Gangwar (Spring 2017)
- Sampreet Mangalvedhe (Fall 2016), Thesis: *On a Biobjective Flow Problem in Networks*
- Arun Jayaraman (Summer 2016)
- Amit Kumar (Summer 2016)
- Prashant Kalidindi Verma (Spring 2016)

- Devaraja Radha Krishnan (Fall 2015), Thesis: *Decomposition Algorithms for the Elementary Shortest Path Problem in Networks Containing Negative Cycles*
- Komal Revankar (Fall 2015), Independent Study: *Autonomous Mobility-on-demand: Operations Research Focused Literature Review*
- Justin Zawoiski (Spring 2015)
- Surender Singireddy (Spring 2014), Independent Study: *Implementing Shortest Path, Maximum Flow and Minimum Spanning Tree Algorithms With Boost Graph Libraries*
- Zhuqi Miao (Spring 2012), Independent Study: *Cluster Detection in Large-scale Social Networks Using $k$-Plexes*
- Juliana Bright (Fall 2011), Thesis: *Robust Shortest Paths Under Uncertainty Using Conditional Value-At-Risk*
- Ninad Joshi (Summer 2011)
- Pranav Dharmadhikari (Summer 2011)
- Vidyasagar Kodukula (Summer 2011)
- Amol Bhave (Fall 2010), Thesis: *Greedy Randomized Adaptive Search Procedure for the Maximum Co-$k$-Plex Problem*
- Ameya Dhaygude (Fall 2010), Thesis: *A Heuristic Approach to the Chance Constrained Minimum Spanning $k$-Core Problem*
- Sameer Mangalvedhe (Fall 2010), Thesis: *Greedy Randomized Adaptive Search Procedure for the Maximum 2-Club Problem*
- Rahul Banda (Fall 2009)
- Krishna Chaitanya Gunturu (Summer 2009)

## Undergraduate Advising

### Senior Design Projects

- Jason Abernathy, Mason Feddersen, Kendel Hart, Sam Koscelny (Spring 2022), *Estimating Lumber Requirements and Minimizing Lumber Wastage in Zeeco Crating Operation*
- Cade Phelan, Victoria Richardson, Kaustuvi Thapa (Spring 2021), *Cost-effective Freight Carrier Selection for ArcBest*
  - Top-5 finalist for the *2021 Outstanding ISE Capstone Senior Design Project Award* given by the Institute of Industrial and Systems Engineers
- Jennifer Fallon, Brittany Grubert, Rylee Hunter, Charlie Robson (Spring 2020), *Increasing Air Fleet Availability at the OSU Flight Center*
- Ahmed Almuhanna, Andrew Browning, Erica Crain, Michael Moylan (Spring 2019), *Enhancement of Inventory Simulator for Engine Parts at American Airlines Maintenance Facility*

- Ronnie Comeau, Jazmin Wilson, Qidong Zhai (Fall 2017), *An Optimized Scheduling Methodology for Air Traffic Controllers at the Federal Aviation Administration*
- Connor Mojo, Hao Pan, Carly Reeves (Spring 2016), *Improving Customer Experiences at Nebu Café*
- Andrea Lewis, Katey Luster, Weikao Wu (Spring 2014), *An Investigation into Routing Efficiency at the Regional Food Bank in Oklahoma City, Oklahoma*
- Erin Lee, Steven Miklosko, Amy Zeckser (Spring 2013), *Process Improvement in Stillwater Medical Center's Same Day Surgery Department in Stillwater, Oklahoma*
- Marco Borunda, Nadia Brigita, Bailey Layman (Fall 2009), *An Investigation of High Patient Waiting Time at the Baptist Community Clinic*
- Marcus Concienne, Mitchel McCowan, Doann Nguyen (Fall 2008), *An Investigation into the Development of a Method to Identify RFQ Similarity at Webco Industries, Inc.*

## Undergraduate Technical Papers & Presentations

- Kaustuvi Thapa, Torie Richardson, and Cade Phelan, *Integer Programming Approach to Solving a Carrier Selection Problem*
  - First Place, IISE South-Central Regional Undergraduate Student Paper Competition, February 2022
- Aarushi Singh, *Comorbidity Network Analysis Using Atomic Cliques*, OSU Undergraduate Research Symposium Poster Presentation, April 2022
  - Recipient of CEAT Undergraduate Research Scholarship for AY2020–2021 and AY2021–2022.
- Bailey Whitman, *Determining an Optimal Inventory Mix for NABco Industries*, (Project Mentor: Dr. Liu)
  - First Place, IISE South-Central Regional Undergraduate Student Paper Competition, March 2018
  - Finalist, IISE International Undergraduate Student Paper Competition, May 2018
- Andrea Lewis, Katey Luster, Weikao Wu, *Delivery Vehicle Routing at the Regional Food Bank of Oklahoma*
  - First Place, IIE South-Central Regional Undergraduate Student Paper Competition, Feb 2015
  - Finalist, IIE International Undergraduate Student Paper Competition, June 2015
  - Participant, INFORMS Undergraduate Poster Competition, Nov 2014
- Ian Giese, *Michelin Recyclable Material Planning Tool*
  - First Place, 2014 IIE Process Industry Division Student Paper Competition
- Erin Lee, *Process Improvement in Stillwater Medical Center's Same Day Surgery Department in Stillwater, Oklahoma*
  - First Place, IIE South-Central Regional Undergraduate Student Paper Competition, Feb 2014
  - Finalist, IIE International Undergraduate Student Paper Competition, June 2014
- Justin Whisenant, *Webco Industries, Inc. Steel Coil Optimization*, (Project Mentor: Dr. Ingalls)
  - Second Place, IIE South-Central Regional Undergraduate Student Paper Competition, Feb 2013
- Ajay Reddy, Ryan Sullivan, *An Analysis of Process Documentation at a Software Providing Organization*, (Project Mentor: Dr. Collins)

- Participant, IIE South-Central Regional Undergraduate Student Paper Competition, Feb 2013

- Austin Buchanan, Adrian Smith, *An Investigation into Instructor Staffing at Oklahoma State University Fire Service Training*, (Project Mentor: Dr. Liu)
  - First Place, IIE South-Central Regional Undergraduate Student Paper Competition, March 2012
  - First Place, IIE International Undergraduate Student Paper Competition, May 2012
  - Participant, INFORMS Undergraduate Paper Competition, Nov 2011
- Thomas Hong, Julianna Bright, Carrie Walker, *An Investigation into the Current Distribution System at Ditch Witch in Perry, Oklahoma*, (Project Mentor: Dr. Ingalls)
  - First Place, IIE South-Central Regional Undergraduate Student Paper Competition, Feb 2010
  - First Place, IIE International Undergraduate Student Paper Competition, May 2010
- Marcus Concienne, Mitchel McCowan, *An Investigation into the Development of a Method to Identify RFQ Similarity at Webco Industries, Inc.*
  - First Place, IIE South-Central Regional Undergraduate Student Paper Competition, Feb 2009
  - Third Place, IIE International Undergraduate Student Paper Competition, May 2009

## Courses Taught

### Graduate

- Introduction to Optimization
- Network Optimization
- Linear Optimization
- Integer and Combinatorial Optimization
- Nonlinear Optimization

### Undergraduate

- Operations Research
- Engineering Economic Analysis
- Senior Design Projects

## Editorial Service

### Associate Editor

- *Networks*, 2012–Present
- *IISE Transactions*, 2013–2018
- *Journal of Global Optimization*, 2009–Present

### Reviewer

- *Mathematical Programming*
- *Networks*
- *Discrete Optimization*
- *Discrete Applied Mathematics*
- *Optimization Letters*
- *Journal of Global Optimization*
- *Journal of Optimization Methods & Software*
- *Annals of Operations Research*
- *Computers & Operations Research*
- *Operations Research*
- *INFORMS Journal on Computing*
- *SIAM Journal on Discrete Mathematics*
- *Journal of Graph Algorithms and Applications*
- *Journal of Combinatorial Optimization*
- *Computational Optimization & Applications*
- *Optimization and Engineering*
- *European Journal of Operational Research*
- *Asia-Pacific Journal of Operations Research*

- *IISE Transactions*
- *Production & Operations Management*
- *IEEE/ACM Transactions on Computational Biology and Bioinformatics*
- *Computers & Industrial Engineering*
- *Journal of Heuristics*
- *Social Networks*

## Service & Professional Activities

- *Elected Member*, Reappointment, Promotion, and Tenure College-Wide Committee, College of Engineering, Architecture, and Technology, Oklahoma State University, 2022–2025
- *Affiliate Faculty*, Center for the Study of Disasters and Extreme Events (CSDEE), Oklahoma State University, 2016–2020
- *Member*, Coalition for Advanced Digital Research & Education (CADRE) Council, Oklahoma State University, 2017–2019
- *Member*, Food-Energy-Water (FEW) Nexus Council, Oklahoma State University, College of Engineering, Architecture, and Technology representative, 2016–2018
- *Member*, Faculty Research Council, College of Engineering, Architecture, and Technology, School of Industrial Engineering & Management representative, 2013–2015
- *Faculty Adviser*, Student Chapter of IIE at Oklahoma State University, 2007–2014
- *Panelist,* "Four Generations in Academia." Graduate Students & Faculty Relationships Workshop, April 4–6, 2014, Texas A&M University, College Station, TX
- *Panelist*, IISE OR Teaching Excellence Award (2020), INFORMS Best Student Poster Competition (2017, 2018), INFORMS George Nicholson Prize Committee (2015, 2016), INFORMS Junior Faculty Interest Group Paper Competition (2014)
- *Proposal Review*: Department of Energy, National Science Foundation, Air Force Office of Scientific Research
- Advisory Board Member of iCREST: Interdisciplinary Center for Research Excellence in Science and Technology (Bioinformatics and Computational Biology), 2011–2014
- Elected *Vice Chair for Networks*, INFORMS Optimization Society, 2011–2013
- *Mentor,* Oklahoma Louis Stokes Alliance for Minority Participation, 2008-2009, 2017

## Professional Memberships

- Institute for Operations Research and the Management Sciences (INFORMS)
- Mathematical Optimization Society (MOS)
- Institute of Industrial and Systems Engineers (IISE)
- Society for Industrial and Applied Mathematics (SIAM)

## Selected Presentations

- "Lethal cliques in comorbidity graphs." Seminar Series, Wm Michael Barnes '64 Department of Industrial and Systems Engineering, Texas A&M University, College Station, TX.
- "Cliques and clubs in temporal graphs." Seminar Series, Department of Industrial Engineering, November 17, 2023, University of Houston, Houston, TX.
- "Club interdiction." 2022 INFORMS Computing Society Conference, January 23–25, 2022, Tampa, FL.
- "Robust low-diameter subgraphs." 2019 INFORMS ALIO International Conference, June 9–12, 2019, Cancún, Mexico.
- "An upper-bounding technique for the maximum quasi-clique problem." 2018 INFORMS Optimization Society Meeting, March 23–25, 2018, Denver, CO.
- "A lazy approach to finding low-diameter clusters in graphs." Seminar Series, Department of Industrial and Manufacturing Systems Engineering, February 7, 2018, Kansas State University, Manhattan KS.
- "The maximum quasi-clique problem." 2017 Global Optimization Conference – GOC 2017, March 30–April 1, 2017, College Station, TX.
- "Recent developments in detecting low-diameter clusters in graphs." Seminar Series, Department of Industrial Engineering, October 6, 2016, University of Pittsburgh, Pittsburgh, PA.
- "Cliques & clubs." Seminar Series, Department of Industrial & Systems Engineering, September 11, 2015, Texas A&M University, College Station, TX.
- "On the 2-club polytope of graphs." 22nd International Symposium on Mathematical Programming (ISMP), July 12–17, 2015, Pittsburgh, PA.