

Mohamed Saeid Eid
Associate Professor
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Department of Construction and Building Engineering
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EDUCATION

The University of Tennessee, Knoxville

Ph.D., Civil and Environmental Engineering (GPA 4.0/4.0) May 2017

Dissertation title: “*Sustainable Infrastructure Development: A Holistic System Based Decision Making Tool Integrating Vulnerability Indicators and Stakeholders Objectives*”

Arab Academy for Science, Technology, and Maritime (Cairo, Egypt)

M.S. in Construction Engineering and Management (GPA 3.92/4.0) December 2012

Thesis title: “*Multi-Objective Non-Unit Based Repetitive Activities Scheduling using Genetic Algorithms.*”

B.S. in Construction Engineering and Management (GPA 3.81/4.0) July 2008

RESEARCH EXPERIENCE

Associate Professor (AASTMT) August 2021- Present

- Detecting health and safety risk in construction sites using computer vision
- Evaluating competitive bids against collusive behavior using machine learning
- Defining optimal strategies for Public Private Partnerships to account for concession period and project risks via bargaining and game theory.
- Studying the implementation of game theory for centralized and connected traffic signals.
- Optimizing water infrastructure systems in South Sinai to increase the community’s sustainability via System Dynamics.
- Developing an allocation model for risk and contingency cost sharing in construction joint ventures using cooperative game theory

Assistant Professor (AASTMT) August 2017- 2021

- Studied the resiliency of the whole sale power market to changes in the consumers’ behaviors.
- Conducted research on site layout and facilities location selection in linear infrastructure projects using Uniform Cost Tree Search.
- Defined optimal governmental policies to incentivize mid-range investors to construct community-service facilities using game theory.
- Utilized cooperative game theory to define the fair revenue share and risk allocation in construction joint ventures.
- Modeled production rates for construction crews via Bayesian Networks and System Dynamics to accurately predict the activities’ durations.

Graduate Research Assistant

Advisor: Prof. Islam El-adaway (UTK) August 2013 – May 2017

- Conducted research on optimal sustainable infrastructure development utilizing Agent Based Modeling through integrating vulnerability indicators into stakeholders’ objective functions.
- Carried out research on disaster recovery optimal strategies utilizing an Agent Based Model to assimilate the different associated stakeholders’ preferences and needs.
- Developed a stable post-disaster insurance profile utilizing Evolutionary Game Theory.
- Supported research on the bidding strategies and the effect of the Winner’s Curse utilizing Auction Game Theory and simulating the different player’s actions and learning behaviors.

- Researched the impact of the dynamic human behavior on the power generation and distribution in Tennessee utilizing Agent Based Modeling from an economic perspective.

Advisor: Prof. Emad Elbeltagi (AAST, Cairo, Egypt)

September 2009 – December 2012

- Conducted research on repetitive activities projects scheduling
- Utilized Genetic Algorithms and Pareto Front Sorting to determine an optimal set of schedules that meets the different repetitive activities projects' criteria.

Through the aforementioned research, I wrote and assisted in multiple grant writings to different funding programs within the National Science Foundation and the Academy of Scientific Research and Technology

HONORS AND AWARDS

- Co-recipient of Best Paper Award at CRC2024, Des Moines, IA (2024) for Construction Scheduling, Estimating, Economics, Quality and Value Track.
- Co-recipient of Best Poster Award at CRC2020, Tempe, Arizona (2020)
- Editor's Choice Journal of Infrastructure Systems, ASCE, September (2018)
- Best Peer Reviewed Paper Award - Journal of Management in Engineering, ASCE (2017)
- Outstanding Graduate Student - CEE UTK (2017)
- Award of Excellence by Dean of College of Engineering – AAST (2012)

PEER REVIEWED PUBLICATIONS

Under Review and Working Papers

1. Salah, Nada, and **Eid, M.** (working paper) "Computer vision approach for road health management".
2. Emad, Y, **Eid, M.**, Bassiouni, H. (working paper) Emad, Y, **Eid, M.**, Bassiouni, H. (working paper) "Team selection and cost deviation sharing in IPD projects for emerging markets – a cooperative game theory approach"
3. Awwad, R., **Eid, M.** and Mekki, A. (working paper) "Impact of dynamic risk behaviour on contractors' bidding strategies"

Published Journal Papers

1. Shahin, Y., **Eid, M.**, Ahmed, H., and Elhakeem, A (2024). "Towards A More Stable Construction Joint Venture Agreement: Individual Rationality Vs. Fairness". International Journal of Construction Management.
2. Kandel, M., **Eid, M.**, Elhakeem, A. (2023). "Game Theory Approach to Decision Making Analysis of Dispute Resolution", Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, ASCE.
3. Idrees S., **Eid, M.**, and Awwad R. (2023) "Impact of Altering the Bid Selection Method to Below-Average Method: An Agent-Based Modeling Approach." Journal of Management in Engineering, ASCE.
4. Huynh, H, Lucko, G., and **Eid, M.** (2023) "Game Theory Approach for Concurrent Delay Analysis". Journal of Construction Engineering and Management, ASCE.
5. Mansour, F., Elsayed, A., **Eid, M.**, Elbeltagi E., and Elmasoudi, I. (2022) "Towards Fairly Sharing Risks in Public Private Partnership Projects: Shapley Value Approach" Journal of Innovative Infrastructure Systems.
6. Mansour, A. G., **Eid, M.**, and Elbeltagi, E. E. (2021). "Construction facilities location selection for urban linear infrastructure maintenance projects using uniform cost search method." *Soft Computing*.

7. Ali, G., Khalef, R., El-adaway, I., **Eid, M.**, Kahle, T., Funke, C., Vaupel, M., and Nault, A. (2021) "Joint Venture Agreements for Construction and Professional Services: Comparative Contractual Analysis and Guidelines" *Journal of Management in Engineering*, ASCE.
8. Eissa, R., **Eid, M.**, Elbeltagi, E. (2021) "A review of game theory in construction engineering and management", *Journal of Construction Engineering and Management*, ASCE.
9. **Eid, M.**, El-adaway, I. (2021) "Discussion of "Multiobjective Optimization of Postdisaster Reconstruction Processes for Ensuring Long Term Socioeconomic Benefits" *Journal of Management in Engineering*, ASCE
10. Eissa, R., **Eid, M.**, Elbeltagi, E. (2021) "Conceptual Profit Allocation Framework for Construction Joint Ventures: Shapley Value Approach" *Journal of Management in Engineering*, ASCE
11. El-adaway, I., Sims C., **Eid, M.**, Liu, Y, Ali, Gasser. (2020). "Preliminary Attempt toward Better Understanding the Impact of Distributed Energy Generation: An Agent-Based Computational Economics Approach" *Journal of Infrastructure Systems*, ASCE.
12. **Eid, M.**, Elbeltagi, E., and El-adaway, I. (2018). "Simultaneous multi-criteria optimization for scheduling linear infrastructure projects". *Int. J. of Project Management*
13. **Eid, M.**, and El-adaway, I. (2018). "A Decision-Making Framework for Holistic Sustainable Disaster Recovery". *J. Infrastructure Systems*.
14. El-adaway, H., Abotaleb, I, **Eid, M.**, May, S., Netherton, L., Vest, J. (2018). "Contract Administration Guidelines for Public Infrastructure Projects in the United States and Saudi Arabia: A Comparative Analysis Approach" *J. Construction Engineering and Management*
15. **Eid, M.**, and El-adaway, I. (2017). "Integrating the Social Vulnerability of Host Communities and the Objective Functions of Associated Stakeholders during Disaster Recovery Processes Using Agent-Based Modeling" *J. Computing in Civil Eng.*
16. **Eid, M.**, and El-adaway, I (2016). "Sustainable Disaster Recovery Decision Making Support tool: Integrating Economic Vulnerability into the Objective Functions of the Associated Stakeholders". *J. of Management in Engineering American Society of Civil Engineers*, 10.1061/(ASCE)ME.1943-5479.0000487 , 04016041.
17. **Eid, M.**, El-adaway, I. (2016). "Sustainable Disaster Recovery: Multi-Agent Based Model for Integrating Environmental Vulnerability into Decision Making Processes of the Associated Stakeholders," *J. Urban Planning and Development., American Society of Civil Engineers*, 10.1061/(ASCE)UP.1943-5444.0000349 , 04016022.
18. **Eid, M.**, El-adaway, I., and Coatney, K. (2015). "Evolutionary Stable Strategy for Postdisaster Insurance: Game Theory Approach." *J. Manage. Eng.*, 10.1061/(ASCE)ME.1943-5479.0000357, 04015005:1-9.
19. Ahmed, M., El-adaway, I., Coatney, K., and **Eid, M.** (2015). "Construction Bidding and the Winner's Curse: Game Theory Approach." *J. Constr. Eng. Manage.* , 10.1061/(ASCE)CO.1943-7862.0001058 , 04015076:1-9.

Conference Proceedings

1. Awwad, R., **Eid, M.**, Mekki, A. (2024) "An Agent-Based Modeling Approach for Evaluating Dynamic Risk Behavior in Competitive Bidding" *Construction Research Congress 2024*, Des Moines, IA.
2. Emad, Y., **Eid, M.**, Bassiouni, H. (2024) "Division of Cost Deviations in Integrated Project Delivery Systems Using Cooperative Game Theory" *Construction Research Congress 2024* Des Moines, IA.
3. Hajjashrafi, R., Huynh, H., Lucko, G., **Eid, M.** (2024) "Concurrent Delay Analysis via Cooperative Game Theory" *Construction Research Congress 2024* Des Moines, IA.
4. Abosamra, H., Elsayad, M., **Eid, M.**, and Elhakeem, A. (2023) "Optimization of Stochastic Repetitive Construction Projects: Minimizing Duration Uncertainties" *The 2023 ASCE International Conference on Computing in Civil Engineering*.

5. Kotb, K., **Eid, M.**, and Osama, A. (2023) "Optimizing Adaptive Signalized Intersections: A Cooperative Game Theory Approach" The 2023 ASCE International Conference on Computing in Civil Engineering.
6. Eissa, R., Shahin, Y., and **Eid, M.** (2022) "Sharing Risk Contingency Costs in Construction Joint Venture Agreements: A Cooperative Game Theory Approach", Construction Research Congress, 2022, Arlington, VA.
7. Huynh, H., Lucko G., and **Eid, M.** (2022) Fairly Apportioning Concurrent Delay Liability: A Game Theory Approach" Construction Research Congress, 2022, Arlington, VA.
8. Eissa, R., **Eid, M.**, Elbeltagi, E. (2020). "A Cooperative Game Theoretic Model for Revenue Sharing in Construction Joint Ventures" Construction Research Congress, 2020, Tempe, AZ.
9. Mansour, A., **Eid, M.**, and Elbeltagi, E. (2019). "Optimal Site Location for Temporary Facilities in Linear Infrastructure. Projects". The 2019 ASCE International Conference on Computing in Civil Engineering, Atlanta, GA.
10. **Eid, M.**, Elbeltagi, E., and El-adaway, I. (2019). "Multi-Objective Simultaneous Optimization for Linear Projects Scheduling The 2019 ASCE International Conference on Computing in Civil Engineering, Atlanta, GA.
11. **Eid, M.**, and El-adaway, I. (2019). "Sustainable Disaster Recovery Framework – Reducing the Community Vulnerabilities Throughout the Redevelopment Process". The 2019 ASCE International Conference on Computing in Civil Engineering, Atlanta, GA
12. **Eid, M.**, and El-adaway, I. (2018) "Decreasing the Economic Vulnerability of the Built Environment throughout the Disaster Recovery Processes: An Agent Based Model Framework" *Construction Research Congress 2018*, pp. 492-502
13. El-adaway, I., Abotaleb, I., **Eid, M.**, May, S., Netherton, L., and Vest, J. (2018) "Contracting in the Saudi Public Constriction Projects: What do U.S. Contractors Need to Know?" *Construction Research Congress 2018*, pp. 239-249
14. **Eid, M.**, and El-adaway, I. (2016) "Sustainable Infrastructure Development through Integrating the Stakeholders Preferences and Host Community's Environmental Vulnerability" *Construction Research Congress 2016*: pp. 1658-1668.
15. **Eid, M.**, El-adaway, I., and Coatney, Kalyn (2016) "Developing a Post Disaster Insurance Profile using Evolutionary Game Theory" *Construction Research Congress 2016*: pp. 1486-1496.
16. Ahmed, M. H., El-adaway, I., Coatney, K., & **Eid, M.** (2016). "Understanding Multi-Stage Bidding Adverse Selection for Construction Contracts using Game Theory" *Construction Research Congress 2016*: pp. 2160-2170.
17. **Eid, M.** and El-Adaway, I. (2015) Optimizing Disaster Recovery Strategies Using Agent-Based Simulation. *International Workshop on Computing in Civil Engineering 2015*: pp. 379-386.
18. **Eid, M.**, El-adaway, I., and Coatney, Kylan. (2015). Evolutionary Stable Strategy for Post-Disaster Insurance: A Game Theory Approach. "5th International Construction Speciality Conference, Vancouver, B.C. 2015".
19. Ahmed, M. H., El-adaway, I., Coatney, K., & **Eid, M.** (2015). Multi-stage bidding for construction contracts: a game theory approach. "5th International Construction Speciality Conference, Vancouver, B.C. 2015".
20. Boz, M., El-Adaway, I., and **Eid, M.** (2014) A Systems Approach for Sustainability Assessment of Civil Infrastructure Projects. *Construction Research Congress 2014*: pp. 444-453.
21. Labarre, P., El-Adaway, I., and **Eid, M.** (2014) The Potential of Construction Project Benchmarking in the Vicksburg District of the U.S. Army Corps of Engineers. *Construction Research Congress 2014*: pp. 1626-1635.
22. **Eid, M.**, Elbeltagi, E., and Abdelrazek, M. (2012). "Multi-objective repetitive activities project scheduling using Genetic Algorithms". 2nd International Conference on Civil Engineering and Building Materials (CEBM 2012) Hong Kong.

TEACHING EXPERIENCE

Certified Associate of the Center for the Integration of Research, Teaching and Learning (CIRTL), 2016.
Arab Academy for Science, Tech. and Maritime (Cairo, Egypt) August 2017-Present
Assistant/Associate Professor

Undergrad Courses

- System Analysis for Construction Engineers
- Project Management (Architecture Department)
- Modeling and Simulation (Computer Engineering Department)
- Introduction to Construction Management
- Construction Project Management I
- Construction Project Management II
- Construction Contracts and Law

Postgrad Courses

- Algorithms applications in Construction Engineering (PhD)
- Advanced Aspects in Strategic Management (PhD)
- Advanced System Analysis (MSc)
- Research Methods for Construction Engineering (MSc)

The University of Tennessee, Knoxville

August 2014-2017

Graduate Teaching Assistant

Undergrad Courses

- Construction Engineering and Management I
- Construction Engineering and Management II
- Structural Mechanics

Postgrad Courses

- Analysis and Mitigation of Construction Conflicts, Claims and Disputes

Mississippi State University

August 2013- May 2014

Graduate Teaching Assistant

- Project Management
- Construction Contracts and Law

Arab Academy for Science, Tech. and Maritime (Cairo, Egypt)

September 2008-June 2013

Graduate Teaching Assistant

- Construction Methods and Equipment I
- Construction Methods and Equipment II
- Construction Management I
- Construction Management II
- Special Topics in Construction Engineering
- Techniques of Planning and Scheduling
- System Analysis for Construction Engineers
- Construction Surveying
- Construction Contracts and Law
- Quantity Takeoff and Cost Estimation
- Building Construction
- Quality Control in Construction Engineering
- Architecture Drawing

MENTORSHIP EXPERIENCE

- 2017-Present Supervising 13 postgraduate students at the AASTMT and The Catholic University of America
- 2017-Present Guiding and mentoring 6 senior-student groups in their graduation project in both construction and traffic engineering disciplines
- 2015-2017 Training new graduate students (UTK) on the different programming languages, the uses of Object-Oriented Programming, and the complexities of the different algorithms.
- 2011-2012 Mentoring multi-disciplinary undergraduate students (Water Resources, Highway, Railway, Coastal, and Construction Engineering) through a one-year graduation project in AASTMT, Cairo, Egypt. The project resulted in "The Analysis of the Development Corridor in Western Desert, Egypt".

EXTRACURRICULAR ACTIVITIES

- Faculty Advisor for Alpha Builders – AASTMT (2018-Present)
- Active Member of AASTMT-Astronomy Club (2017-Present)
- Co-founded the Egyptian Student Association (E.S.A.) at the University of Tennessee (2016)
- President of the E.S.A.-UTK (2016-2017)

INDUSTRY EXPERIENCE

Trading and Contracting Group (Egypt)

- Full time site engineer May 2003-May 2008
- Part time engineer and project management June 2008- July 2013
- Overseeing the construction of the following Resorts' Spas and Wellness Centers
- JW Marriot, Cairo
 - Sofitel Al-Gazirah, Cairo
- Part time operation supervisor and procurement August 2017- Present
- Supervising the contracted work and maintaining the supply chain

MEMBERSHIP

- *Member of the Egyptian Engineers' Syndicate*
- *Member of the American Society of Civil Engineers*
- *Member of the Construction Research Council*

PRESENTATIONS

Conferences

1. "An Agent-Based Modeling Approach for Evaluating Dynamic Risk Behavior in Competitive Bidding" Construction Research Congress 2024, Des Moines, IA
2. "Fairly Apportioning Concurrent Delay Liability: A Game Theory Approach" Construction Research Congress, 2022, Arlington, VA.
3. "A Game Theory Approach to Incentivize Private Sector in Building Community Service Projects", Construction Research Congress, 2020, Tempe, AZ.
4. "Multi-Objective Simultaneous Optimization for Linear Projects Scheduling". The 2019 ASCE International Conference on Computing in Civil Engineering, Atlanta, GA.
5. "Decreasing the Economic Vulnerability of the Built Environment throughout the Disaster Recovery Processes: An Agent Based Model Framework" *Construction Research Congress 2018*.
6. "Understanding Multistage Bidding Adverse Selection for Construction Contracts Using Game Theory". *Construction Research Congress 2016*.
7. "Developing a Post Disaster Insurance Profile using Evolutionary Game Theory". *Construction Research Congress 2016*.

8. "Sustainable Disaster Recovery through Integrating the Stakeholders Preferences and Host Community's Environmental Vulnerability". *Construction Research Congress 2016*.
9. "Optimizing Disaster Recovery Strategies using Agent Based Simulation" *International Workshop on Computing in Civil Engineering 2015*.
10. "A Systems Approach for Sustainability Assessment of Civil Infrastructure Projects". *Construction Research Congress 2014*
11. "The Potential of Construction Project Benchmarking in the Vicksburg District of the U.S. Army Corps of Engineers". *Construction Research Congress 2014*
12. "U.S. Economic Indicators and Stock Prices of Construction Equipment Manufactures" A Statistical Relationship Analysis. *Construction Research Congress 2014*
13. "Time At Large within the Common Law Legal System: Application to Standard Forms of Contract". *Construction Research Congress 2014*
14. "Biddability, Constructability, Operability, and Environmental Checklist: Potential Role in Reducing Conflicts, Claims, and Disputes". *Construction Research Congress 2014*

Invited Talks

1. Department of Civil Engineering, British University of Cairo, "On the Applications of Game Theory in Construction Engineering and Management", February 2024.
2. AASTMT Astronomy Club "Stars Formation" May 2019
3. Department of Civil, Environmental, and Infrastructure Engineering, George Mason University, April 2017. "Framework for Holistic Sustainable Disaster Recovery: Integrating Vulnerability Indicators into the Objective Functions of the Stakeholders"
4. Department of Civil and Environmental Engineering, University of Tennessee, October 2016. "Sustainable disaster recovery through environmental vulnerability reduction and broad community involvement."
5. Department of Agriculture Economics, Mississippi State University, April 2015. "Evolutionary game theory and stable strategies and application in the insurance industry".

ACADEMIC SERVICES

Reviewer, Journal of Management in Engineering, ASCE.

Reviewer, Journal of Construction Engineering and Management, ASCE

Reviewer, Journal of Construction Management and Economics

Reviewer, International Journal of Disaster Risk Reduction, Elsevier

Reviewer, International Journal of Construction Management, Taylor and Francis.

Reviewer, Journal of Sustainability, MDPI, Switzerland.

Reviewer, Journal of Environments, MDPI, Switzerland.

Reviewer, Engineering Science and Technology, an International Journal. Elsevier B.V.

Reviewer, The 2019 ASCE Int. Conference on Computing in Civil Engineering, Atlanta, GA.

Reviewer and Program Committee Member, Construction Research Congress, March, 8th –March, 10th, 2020 Tempe, Arizona.

Reviewer, Construction Research Congress, April, 2nd – April 4th, 2018 New Orleans, Louisiana.

Reviewer, Construction Research Congress, May, 31st –June, 2nd, 2016 San Juan, Puerto Rico.

Reviewer, Construction Research Congress, May, 19th –May, 21st, 2014 Atlanta, Georgia.

SKILLS

- Programming Languages: Java, Python, C++, C, and VB
- Mathematical and Statistical Analysis Packages: Mathematica, MATLAB, SAS, SPSS, and R
- Computer Aid Design: AutoCAD, REVIT
- Geographic Information System: ArcMap
- Construction Planning and Scheduling: Primavera P6 and P3.1, and MS Project