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Engineering & Scientific Consulting

Elif Erkal, Ph.D.

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Professional Profile

Dr. Erkal focuses on helping her clients diagnose their project management systems and develop integration plans to improve their effectiveness. She specializes in translating both well-established and state-of-the-art project management systems into practice through multi-disciplinary collaborations and research to help her clients' changing needs.

Dr. Erkal has extensive hands-on experience in developing and communicating innovations through industry engagements. In graduate research, she specialized in assessing, and developing safety management systems for improved safety performance. Dr. Erkal's experience with expert-oriented research is utilized by many industry teams to find effective solutions to challenging problems through consensus building, focus groups, interviews, and brainstorming sessions. She has led professional teams in efforts of research, development and implementation for organizational change and project management success.

Dr. Erkal supported the integration of cutting-edge project management ideas from generation to design and to implementation. Her work in organizational learning in construction organizations, contract negotiations, knowledge management and data collection frameworks, functional team networks, and machine learning systems for predictive decision-making solutions proved impactful for the implementing organizations and is recognized through peer-reviewed research. Dr. Erkal has worked in various types of projects such as infrastructure, onshore oil and gas facilities, utilities and service, nuclear, residential and commercial buildings.

Dr. Erkal's field experience includes acting as the contract manager in large infrastructure projects providing contract administration and implementation support, preparing claims, and assessing project controls (operations, cost, quality, safety, schedule) in pre- and post-completion processes.

Academic Credentials & Professional Honors

Ph.D., Civil Engineering, University of Colorado, Boulder, 2022

M.Sc., Architecture Eng. and Construction Management, Carnegie Mellon University, 2019

B.Sc., Civil Engineering, Istanbul Technical University, Turkey, 2014

Outstanding Graduate Researcher Award, Construction Safety Research Alliance, 2021

Academic Appointments

Graduate research assistant, Civil Engineering, University of Colorado Boulder, 2019-2022.

Graduate teaching assistant, Civil Engineering, University of Colorado Boulder, 2019.

Adjunct faculty, Architecture Engineering and Construction Management Program, Carnegie Mellon University, 2018.

Research assistant, Architecture Department, Carnegie Mellon University, 2017.

Prior Experience

Project lead, Construction Safety Research Alliance, 2019-2022.

Researcher graduate student, Capital Projects, Los Alamos National Laboratory, 2019.

Project estimator and claims engineer, Kiska Construction, 2017.

Contracts manager, Yenigun Construction Co., 2015-2017.

Civil engineer/Structural designer, Arti Architecture Engineering Consulting, 2014-2015.

Professional Affiliations

American Society of Civil Engineers (ASCE)

Construction Safety Research Alliance (CSRA)

Construction Management Association of America (CMAA)

Languages

Turkish

Publications

Published/Accepted:

Oguz Erkal, E. (2022). Predicting Serious Injury and Fatality Exposure in Construction Industry. Ph.D. Dissertation, University of Colorado Boulder, 2022.

Oguz Erkal, E. & Hallowell, M. (2022). Moving Beyond TRIR: Measuring and Monitoring Safety Performance with High-Energy Control Assessments (HECA). Professional Safety Journal. – accepted

Oguz Erkal, E., Hallowell, M., & Bhandari, S. (2022). Formal Evaluation of Safety Performance Metrics and a Case for a Balanced Approach. Journal of Safety Research. – accepted

Oguz Erkal, E., Hallowell, M., & Bhandari, S. (2023). Predictive Modeling for Serious Injury and Fatality Exposure in Construction Projects. Submitted and under review: Automation in Construction. – revision under review.

Oguz Erkal, E., Hallowell, M., & Bhandari, S. (2021). Practical Assessment of Potential Predictors of Serious Injuries and Fatalities in Construction. Journal of Construction Engr. & Management.

Oguz Erkal, E., & Molenaar, K. (2020). Organizational Learning in Public Construction Organizations: A Case Study. Construction Research Congress (pp. 408 - 417). American Society of Civil Engineers.

Oguz Erkal, E., & Molenaar, K. (2023). Precontract Negotiations in Design-Build Projects. (Accepted to Construction Research Congress 2022)

In Preparation/Submitted:

Oguz Erkal, E., Hallowell, M., & Bhandari, S. (2023). Alternative Measures of Safety Performance. intended for: Journal of Construction Engr. & Management.

Hallowell, M. & Oguz Erkal, E. (2023). Severity Based Lagging Indicators. intended for: Professional Safety Journal.

Hallowell, M., Oguz Erkal, E. (2023), Court, M., Davis, M. & MacLean, B. An opportunity to put our metrics where our mouth is. intended for: Professional Safety Journal.

Presentations

Oguz Erkal, E. Leveraging AI to create a Safer Workplace Environment Webinar, EHS Today, 2023.

Oguz Erkal, E. Predictive Analytics for Safety. Wolfcreek Group Safety Summit, Houston, TX, 2022.

Oguz Erkal, E. Predictive Analytics for Safety. Human Performance Workshop Series, Electric Power Research Institute (EPRI), Chicago, IL, 2022.

Oguz Erkal, E. High Energy and Controls Assessments. Webinar presentation, Community of Practice, Construction Safety Research Alliance, University of Colorado Boulder, 2022.

Oguz Erkal, E. Predictive analytics project final report. Presentation, Safety Summit, Construction Safety Research Alliance, Boulder, CO, 2022.

Oguz Erkal, E. Predictive Analytics for Safety. EEI Fall Occupational Safety & Health Committee Conference, Edison Electric Institute, Spokane, WA, 2022.

Oguz Erkal, E. Alternatives to TRIR. Webinar presentation, Community of Practice, Construction Safety Research Alliance, University of Colorado Boulder, 2022.

Oguz Erkal, E. Predictive analytics in serious injury and fatality prevention. Lecture presentation, Project Leadership Institute, Stanford University, Boulder, CO, 2022.

Oguz Erkal, E. Measuring safety performance. Presentation, Future of EHS – Work to Zero Summit & Expo, National Safety Council, Louisville, KY, 2022.

Oguz Erkal, E. Precontract Negotiations in Design-Build Projects. Construction Research Congress, Washington D.C., 2022.

Oguz Erkal, E. Predictive analytics in construction. Presentation, Associated General Contractors (AGC), Denver, CO, 2022.

Oguz Erkal, E. Predictive analytics project progress report. Presentation, Safety Summit, Construction Safety Research Alliance, Boulder, CO, 2021.

Oguz Erkal, E. Automation in Construction. Guest lecture, University of Colorado Boulder, Boulder, CO 2021.

Oguz Erkal, E. Predictive analytics project initial report. Virtual presentation, Safety Summit, Construction Safety Research Alliance, Boulder, CO, 2020.

Oguz Erkal, E, Molenaar, K. Organizational Learning in Public Construction Organizations: A Case Study. Construction Research Congress, Phoenix, AZ, 2020.

Oguz Erkal, E, Anaya L. Organizational learning project. Poster presentation, Los Alamos National Laboratory, Los Alamos, NM, 2019.

Project Experience

Acted as the technical advisor of a major utility contractor community of practice group in researching and developing safety performance measurement systems. Designed and managed data collection, analysis, and final reporting for community implementation.

Managed research teams of construction safety professionals to develop a predictive safety performance dashboard. Conducted expert opinion research including consensus building methods (Delphi, focus groups, interviews, brainstorming, etc.) and implemented bias reduction techniques.

Contributed to academic knowledge about serious injury and fatality prevention by generating a comprehensive catalogue of validated predictors of incidents, and developing a new safety performance metric to improve the shortcomings of incident rates

Designed and reported on a machine learning pipeline to predict serious injury and fatality exposure. Managed on-site data collection and interdisciplinary data science collaborations. Created training modules, surveys, and videos for industry engagement.

Engaged with executive leadership teams to diagnose organizational learning opportunities and barriers in large infrastructure organizations. Used network analysis methods to evaluate potential improvements in knowledge management and organizational communication systems. Conducted root cause analysis to assess the root causes of the challenges.

Developed cost and risk-loaded work schedules using Monte Carlo simulation techniques on Primavera Risk Analysis tool to designate contingency budgets and foresee potential delays. Prepared executive reports for project management and controls to incorporate this information in making trade-offs between competing project priorities.

Designed and managed Social Network Analysis project on architectural design collaborations and learning. Collected on-site survey and observation data to identify the teamwork functionalities of architects during design processes.

Prepared and delivered bid packages for middle/high scale construction projects and participated in industry outreach for subcontractors. Formulated subcontractor breakdowns and contracts for estimated projects to support risk management and cost control.

Assisted in the generation of work breakdown structures for construction projects. Managed and monitored Primavera project schedule generation, updating, and communication.

Ensured that operations, safety, planning, and quality staff operate in accordance with appropriate and current project specific procedures, instructions, project schedules and budgets per the civil and earthwork contracts in a $6B onshore oil and gas construction project. Monitored and managed contractual processes about the changes to the value and scope of work. Supported the official internal and external communications between project stakeholders.

Facilitated data collection and archival support in preparation of contract claims and changes. Participated and advised during the settlement of contracts and claims through negotiations.

Performed 3D modeling and structural design using AutoCAD, SAP, Revit, and BIM for various new construction and restoration projects.

Research Grants

Construction Safety Research Alliance Fellowship Award

Los Alamos National Laboratory Safety SPOT Award

Interdisciplinary Ethics Tech Competition 3rd rank Award

Peer Reviews

Journal of Construction Management

Safety Science

Automation in Construction

Practice Periodical on Structural Design and Construction