Exponent®
Engineering & Scientific Consulting

Leonidas Emmenegger, Ph.D.

Senior Engineer | Civil and Structural Engineering
Atlanta
+1-678-412-4872 | lemmenegger@exponent.com

Professional Profile

Dr. Emmenegger specializes in analyzing and predicting the deterioration of civil infrastructure such as bridges, buildings, and airports from the perspective of concrete material science, corrosion engineering, and civil engineering. Since joining Exponent as a forensics consultant, Dr. Emmenegger has been involved in numerous matters including construction defect litigation, structural failure analysis, extreme event claims, codes and standards compliance research, and personal injury disputes.

His experience in construction and engineering litigation support typically includes site visits to collect critical data, review and distillation of pertinent documentation, engineering and scientific analysis, and dissemination of findings through technical reports and presentations. Some notable cases he has worked on include a concrete failure and construction defect dispute at an environmental facility, the failure of a metal building under extreme weather conditions, and litigation arising from contested curing practices and quality assurance testing per FAA regulations at an airport. In addition, he also has experience with building envelope investigations (water intrusion, façade anchorage, etc.), structural foundation movement from expansive soils, and construction repair cost disputes.

Prior to joining Exponent, Dr. Emmenegger was a graduate research assistant at the Georgia Institute of Technology (Georgia Tech), where he earned his Ph.D. with a construction infrastructure systems engineering specialization. He has been sponsored through projects from the Georgia Department of Transportation and National Cooperative Highway Research Board IDEA Program. His primary research investigated and developed best practices for improved longevity of reinforced concrete bridge decks through contractual incentives. Through this work, he was able to develop sample contractual framework for improved bridge deck construction. This framework is uniquely supported by service life modeling based on historical data from in-service bridges.

Apart from his primary academic institution, Dr. Emmenegger has conducted research at the French Institute of Science and Technology for Transport, Development, and Networks (now Université Gustave Eiffel) in collaboration with faculty from Ecole des Ponts Paris Tech. While at that institution, he developed a novel structural life prediction model for reinforced concrete bridge decks which predicts degradation from construction to replacement. Dr. Emmenegger also has product development experience gained as a graduate research assistant at the University of South Florida. There, he scaled-up and developed a rugged corrosion detection probe from laboratory scale to a field capable prototype. He was part of a team that successfully demonstrated the function of the new probe on portions of the old Sunshine Skyway bridge in Tampa, Florida.

Dr. Emmenegger is a member of American Concrete Institute (ACI) technical committees on concrete nondestructive testing and durability. Outside of his technical specialties his interests include business (marketing, supply chain, venture capital) and law (construction and intellectual property); areas in which he took courses to earn a certificate in engineering entrepreneurship at Georgia Tech.

Academic Credentials & Professional Honors

Ph.D., Civil Engineering, Georgia Institute of Technology, 2020

M.S., Civil Engineering, University of South Florida, 2015

B.S., Civil Engineering, University of South Florida, 2014

Georgia ACI Chapter Robert H. Kuhlman Memorial Scholarship, 2018

NSF CEE Gateways to France Scholar, 2018

Licenses and Certifications

Professional Engineer, Alabama, #PE55191

Professional Engineer, Florida, #99967

Professional Engineer, Georgia, #PE054798

OSHA 30 Hour Outreach Training for the Construction Industry (29 CFR 1926)

Prior Experience

Graduate Research Assistant, Georgia Institute of Technology, 2017-2020

Visiting Researcher, IFSTTAR, 2018

Research Assistant, University of South Florida, 2014-2016

Professional Affiliations

American Concrete Institute (ACI)

ACI 228 Nondestructive Testing of Concrete Committee Member

ACI 201 Durability of Concrete Committee Member

American Institute of Steel Construction (AISC) Member

Languages

Greek

Patents

US Patent 10,317,358: Systems and Methods for Contactless Assessment of Structures Buried in Soil, June 2019 (Sagues AA, Ruth WC, Emmenegger LP, Paz Velasquez EA).

Publications

Emmenegger, L.P., Sagues, A.A., Kelvin Probe Array for Rapid Survey of Reinforced Concrete Corrosion. ACI Materials Journal 117 (2). 2020.

Kessler, S.; Emmenegger, L.P.; Sagues, A.A.; Korrosionsdetektion an Stahlbetonbauwerken:

konventionell und innovative. Bautechnik 97 (1), 2020. (In German)

Presentations

Emmenegger, L.P. Sustainability in Concrete Bridges: Exploring the Impact of SCM Limits. Cementitious Materials International Congress Americas April 2025.

Emmenegger, L.P. Concrete Building Design & Construction. Seminar instructor September 2024.

Emmenegger, L.P. Stochastic model for predicting the service life of reinforced concrete bridge decks. Presentation, 10th Advances in Cement-Based Materials, Urbana, IL, 2019

Conference Papers

Bishop C., Moncarz P., Locke W., Emmenegger L. Using a Performance-Based Approach to Predict the Effect of Defective Construction on Deaths, Dollars, and Downtime. The 6th International Conference on Protective Structures (ICPS6) May 2023.

Sagüés, A.A., Emmenegger, L.P., Paz Velasquez, E.A., Ruth, W.C. Macroscopic Kelvin Probe for Contactless Corrosion Assessment of Structures Buried in Soil. IEEE Sensors October 2016.

Final Reports

Stewart, L.K, Kurtis, K.E., Emmenegger, L.P. Quantifying the Impact of Cover Deficiencies on Bridge Deck Service Life: Recommendations for Contacting. Georgia Department of Transportation Research Project 17-05 Final Report September 2020.

Sagüés, A.A., Emmenegger, L.P. Contactless Electrode for Fast Survey of Concrete Reinforcement Corrosion. NCHRP-IDEA Project 176 Final Report 2017.

Peer Reviews

Structure and Infrastructure Engineering