

EEE Research Seminar

Date: January 23, 2024, at 10:30 AM

Location: POTR 234 (Fu Room)

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Spatial Life Cycle Assessment: Inception, Development, Application, and Beyond

Abstract

This seminar introduces Spatial Life Cycle Assessment (Spatial LCA), a methodological enhancement in environmental impact assessment through the integration of geographical information. The session charts the development of Spatial LCA within the context of ongoing research into the environmental impacts associated with critical material extraction. It delves into the challenges and breakthroughs encountered in creating this framework, with particular emphasis on novel approaches to location labeling and impact mapping within the LCA process. A case study of lithium extraction from Nevada clays is used to demonstrate the method, illustrating the transition from a conventional LCA to a more comprehensive Spatial LCA. The broader implications and benefits of Spatial LCA for various stakeholders are also briefly discussed, including its utility in preemptive ecological damage mitigation and targeted contaminant testing. Looking forward, the presentation outlines future research directions that build upon and extend the Spatial LCA framework. One such area is the development of Sustainable Sourcing routes, aiming to optimize material sourcing locations, thereby further enriching the decision-making process in this field.

Bio

Venkat Roy is a PhD student in Environmental & Ecological Engineering at Purdue University, working under the supervision of Prof. Fu Zhao. His research focuses on novel methods for environmental impact assessment, particularly in the field of critical material extraction. Some of his other work includes crop yield prediction using bioclimatic factors, solar power forecasting and optimizing metal 3-D printing processes. Prior to his current academic pursuits, he worked as an R&D engineer in additive manufacturing at Indo-MIM, San Antonio, Texas. He holds an MS in Mechanical Engineering from UC San Diego and a B. Tech. from the Indian Institute of Technology Madras.