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**ISB 210**



**Dr. Nadi Serhan Aydın**

## **Integrated Multi-Period Planning for Earthquake SAR: A Preliminary Case Study of Istanbul**

**SHORT BIO:** Nadi Serhan Aydın is an associate professor of Industrial Engineering at Istinye University. He has held research positions at Imperial College London, Heidelberg University, and Ulm University, and worked as a senior economist on international development projects with the OIC, World Bank and UN agencies. He earned his BSc in Management Engineering from ITU and his MSc and PhD in Mathematical Finance from METU, and is a certified Financial Risk Manager (FRM). His research focuses on mathematical optimization, sequential decision making, and data-driven decision methods including ML/DL.

**ABSTRACT:** Based on an ongoing study, this talk presents an integrated optimization framework for earthquake search-and-rescue (SAR) planning that jointly addresses facility location, resource allocation, and team routing under uncertainty. The model is formulated as a multi-period, multi-objective MILP that captures the evolving nature of demand and network accessibility in a set of major earthquake scenarios. It balances three operational goals in a multi-objective sense: rapid response for life-saving interventions, equitable service coverage across affected areas, and efficient use of limited financial resources for preparedness and deployment. Using Istanbul as a case study, the talk demonstrates how linking pre-disaster positioning with post-disaster routing decisions can improve both efficiency and fairness. The framework incorporates scenario-based uncertainty and DP-based damage-adjusted travel times, and is supported by computational results that highlight its practicality for real-time decision support in urban SAR operations.