Optimization, Simulation, and Planning Heuristics in Global Logistics

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Global logistics planning presents many complex optimization and simulation challenges. Systems must coordinate the movement of personnel, equipment, and supplies across vast multi-modal transportation networks, balancing competing objectives such as speed, cost, and resource utilization. The Analysis of Mobility Platform (AMP), developed in part by Argonne National Laboratory, is a tool for analyzing such problems and serves as a case study in the application of mathematical frameworks to address these challenges. This talk provides a broad overview of the approaches that enable AMP to support large-scale operations. We explore the underpinning of route-finding and planning heuristics in global logistics with a focus on graph theory, optimization, and simulation in real-world scenarios.