Disaster Management Based on Multi Agent Transportation Simulation

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Refreshments available at 3:30 pm

Location: Civil & Environmental Conference Room – Room 232
McCormick School of Engineering, 2145 Sheridan Road, Northwestern University Evanston Campus

Abstract  In order to minimize the damages of natural disaster such as tsunami, an emergency action plan for the vulnerable coast should be developed. The evacuation plan is able to reduce impacts on unexpected tsunami. Disaster management should have a guideline of proper evacuation route planning in order to minimize immeasurable loss of life and property. In this study, an evacuation network is designed to develop an evacuation plan by a hierarchical network design problem (HNDP) used in communication networks, public transport, and social organization network design. Experimental analyses have been carried out in order to find effective evacuation plans at Haeundae beach, Busan, Korea using multi agent transportation simulation (MATSim). In particular, a hierarchical evacuation network design has been developed using the concepts of hub location, clustering and network design (HLCND) problem. The corridor lines of the hierarchical evacuation network generated by a minimum distance rule, a maximal flow rule, a maximum accessible rule, and a minimum travel time rule have been compared to see their performance using the MATSim analysis. The vulnerability of the hierarchical evacuation network has then been assessed to identify focal points for the disaster management.

Bio: Dr Seungjae Lee is currently Full Professor in Department of Transportation Engineering, the University of Seoul. He has been involved in teaching, research and consultancy in the area of Transportation Planning for the past fifteen years in the University of Seoul. He obtained his PhD in Civil and Environmental Engineering from University College London, 1995. He received his first and master degrees in Industrial Engineering and Urban Planning respectively. He worked in Department of Statistical Science, University College London, and Korea Transport Institute after his PhD. He was Head of Department and Director of Center for Transport Research, University of Seoul. He has served Journal of Advanced Transportation (SCIE indexed Journal, John Wiley) as an Editor and Transportmetrica Journal (SSCI Indexed Journal, Taylor and Francis) as an Associate Editor among others. He has served a steering review board committee of National Research Foundation of Korea. He received the Smeed Prize in the UTSG conference, and Chevening Scholarship from British Embassy. He has published more than 100 peer reviewed research papers. The papers cover a wide range of transport modeling issues from conventional travel demand analysis to advanced dynamic modeling techniques.

Bio: Dr Shinhae Lee is currently Research Fellow in the Seoul Institute. She has developed many important transport policies and plans such as “Public Transport Oriented Policy”, “Pedestrian Master Plan”, “Large Scale Household Travel Survey and Estimation of Travel Demands” for the Seoul Metropolitan Government last decade. She obtained her PhD in Graduate School of Environmental Studies, Seoul National University, 2002. Her PhD thesis is entitled as “Transit Travel Demand Estimation Based on Passenger Counted Data” She has served Journal of Seoul Studies as an Editor. She has served a Korea President Advisory Committee for Sustainable Development, a National Advisory Committee for Traffic Impact Studies, and a Local Government Advisory Committee for Urban Planning among others.