

PhD in Civil and Environmental Engineering

Research Title: Pedestrian evacuation simulation under the scenario with earthquake-induced debris

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Context of the research activity	Earthquake-induced collapse of buildings has been effectively controlled in recent years. However, failure of non-structural components and the subsequent falling debris are still serious, which brings a new threat to outdoor evacuation. The project will focus on performing in-depth research on pedestrian evacuation simulation considering falling debris. LS-DYNA will be adopted to study the features of falling non-structural components. The debris distribution model will be proposed using regression analysis. Besides, experiments are planned to be conducted to quantify the influence of debris on pedestrian movement. Finally, based on the simulation method, some dense urban areas will be selected as case studies to conduct regional evacuation simulation, and to figure out the influence of falling debris on pedestrian evacuation and identify the areas which are at high risk of falling objects.
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Objectives	<ul style="list-style-type: none">• Develop large scale simulations at the urban level of pedestrian evacuation using Agent-Based models (ABM);• Implementation and calibration of human behavior model in each agent;• Analyze and simulate different interdependencies between built environment and the transportation network;
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Skills and competencies for the development of the activity	Good knowledge of finite element analysis, skilled in FEA softwares including LS-DYNA, MSC.Marc, Openseas, etc. Familiar with Python and C language. Experience in GIS software
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