AIMS^2 Research Project in Civil Engineering

Research Duration:	Summer 2018 (June – August 2018)
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Title of Project:	Experimental Study of Building Vibration Responses with Tuned Liquid Damper – Seismic Induced Vibrations

Goals and Objectives of the Project, Expectations and Outcomes

This summer project is based on last summer project. The findings suggest that the passive tuned liquid damper (TLD) reduces the vibration response of buildings with restrictions. This project will focus on the liquid damper's dynamic behavior by obtaining analytical analysis and conducting shake-table experiments. The shake table experiments will include the harmonic motions and the simulated seismic motions (such as 1997 Northridge earthquake). The effectiveness of the passive TLD for buildings will be evaluated with various geometric parameters and liquid properties. The faculty mentor will guide students in group discussions about building modeling and earthquake safety considerations through simple physics. The background information and last year project will be introduced to the participants.

Student research assistants are expected to attend weekly meetings and to work 8 to 10 hours per week. Students are also expected to present in the AIMS^2 Research Symposium (week of Sept 10th or Oct. 1st, TBA). This project does not require students to have strong background in engineering majors, nor programming skills. However, they must be willing to learn while learning and think deeply about this project.

Through this project students will
(1) develop research skills such as an ability to develop and refine good questions to get needed information from open web-resources,
(2) be engaged to basic engineering problem-solving steps from the issue discovery, problem identification (convert to a solvable engineering and science project from a real-life issue), solution plans, implementation, analysis and interpretation, and
(3) gain experiences in building and testing an instrumented building model, and collaborate in teams.