Jong-Wha Bai joined the Ph.D. program in Civil Engineering at Texas A&M University after he graduated from the same department with a M.S. degree in May 2004. He is conducting research focused on the evaluation of seismic performance of concrete structures, structural rehabilitation including seismic retrofitting, and fragility analysis of concrete structures.

He began work on the Mid-America Earthquake (MAE) Center project Structure Retrofit Strategies (CM-4) as a research assistant in 2002. This study is part of a MAE Center research program focusing on consequence minimization, which contributes to the development of a new Consequence Based Engineering paradigm. This research is being conducted at Texas A&M University supported by the Mid-America Earthquake Center through the Earthquake Engineering Research Centers Program of the National Science Foundation under NSF award number EEC-9701785 and the Department of Civil Engineering at Texas A&M University.

The objective of the research is to assess seismic fragility of typical concrete structures in the Central United States (U.S.). The effectiveness of seismic retrofitting applied to enhance seismic performance has been assessed for a five-story RC flat-slab building structure. The response of the structure was predicted using nonlinear static and dynamic analyses with synthetic ground motion records developed for the Central U.S. region. Based on the seismic evaluation results, three retrofit techniques were applied to the case study structure to enhance the seismic performance, including addition of shear walls, addition of RC column jackets, and confinement of the column plastic hinge regions using externally bonded steel plates. In addition to this, an assessment of seismic fragility that relates the probability of exceeding a performance level to the earthquake intensity was conducted. Finally, recommendations were made for implementing the seismic fragility analysis results into MAEViz, the seismic loss reduction analysis tool developed by the MAE Center. Additional typical concrete structures found in the Central U.S. are currently being studied.

Any questions regarding the research project can be directed to Dr. Mary Beth Hueste (mhueste@tamu.edu).