Addressing an acute national need.

Leaks in the Puerto Rico water system consume nearly half of the island’s drinking water before it ever reaches the tap. Unidentified damage to steel buildings caused by the 1989 Loma Prieta Earthquake was discovered only after the 1994 Northridge Earthquake. Undetected precursors to deterioration and damage and subsequent postponed maintenance have resulted in maintenance deficiencies of U.S. roadways and bridges costing $92 billion. These are all examples of the aging civil infrastructure the United States, a complex issue that spans several disciplines and relies on academic and industrial collaboration at national and global levels.

A two-campus interdisciplinary research and education program.

The mission of the Intelligent Diagnostics IGERT is to train leaders in the technical and social implications of intelligent diagnostics for aging civil infrastructure, while addressing technology challenges, global workforce needs, and urban and public policy needs. The program integrates testbeds and real-world data, industry internships, research center collaboration, multicultural education, and multidisciplinary coursework such as: Linear Systems for Diagnostics, Identification & Damage Characterization, Social, Economic & Political Policy, Non-Destructive Evaluation Sensors, Inverse Problems, and Materials & Fracture.

Projects integrate with academic research centers and industry.

IGERT Fellows work on research projects that embrace state-of-the-art technology in sensing and diagnostics and develop solutions that can be implemented in practice. The integrated experience develops domain experts with understanding of the physical system. Research focuses on strategies to characterize change. Ongoing projects include: health monitoring techniques to locate and quantify structural abnormalities; development of novel sensing devices for subsurface infrastructure assessment; and improved computational modeling of wave-based modalities. Research projects address problems that are significant to the overall integrity of infrastructure systems and will lead to timely detection and action.

Multi-disciplinary advising.

Students carry out their dissertation research under the supervision and guidance of a team of advisors containing members from no fewer than two departments or disciplines. Graduates are prepared for careers in research, academia, or industry. The Intelligent Diagnostics IGERT engages 28 faculty from nine departments and two universities.