

Nazir Lajnef

College of Engineering

Department of Civil and Environmental Engineering

Dr. Nizar Lajnef is an Assistant Professor in the Department of Civil and Environmental Engineering. His research interests include design and implementation of a smart continuous-monitoring system for asphalt and concrete pavement structures; design and implementation of a sub-microwatt self-powered fatigue sensor; sensors design for civil infrastructure and biomechanical systems; and sensors networks design and implementation nano-watt and self-powered sensors, and smart materials/composites/alloys and systems. Nizar Lajnef received his Ph.D. degree in Civil Engineering right here from Michigan State University.

Global Research Interests:

Nazir's global research interests include; design and implementation of a smart continuous-monitoring system for asphalt and concrete pavement structures; design and implementation of a sub-microwatt self-powered fatigue sensor; sensors design for civil infrastructure and bio-mechanical systems; sensors networks design and implementation; nano-watt and self-powered sensors, and smart materials/composites/allows and systems. Another aspect of his research is related to the development of multifunctional materials as power transducers for the sensing system.

Lajnef is interested in sensors designed for civil infrastructure and biomechanical systems as well as self-powered sensors and smart materials and systems. He is working on the design and implementation of a smart continuous-monitoring system for asphalt and concrete pavement structures as well as the design and implementation of a sub-microwatt, self-powered sensor. His goal is to jump start a collaboration with research groups in France that are currently testing smart sensing technologies.

Description of Research Proposal:

Investigation of in-field installation procedures and the system's long term performances under real field conditions. The objective is to jump start a collaboration with research groups in France that are currently testing smart sensing technologies. For example, the "Sense-city Nanosensors for Cities and the Environment" project.

The second aspect is related to the development of multifunctional materials as power transducers for the sensing system. Michigan State University will handle the experimental procedures while the partners in France will work on the theoretical and numerical tools for the constitutive models of the new materials. The objective is to develop a numerical tool for the aided-design of energy conversion and harvesting devices consisting of etched hybrid laminate thin films composed of shape memory alloys and ferroelectric ceramic layers

Region/Country of research:

France