University at Buffalo
Department of Civil, Structural and Environmental Engineering
School of Engineering and Applied Sciences

ENGINEERING SEMINAR

Innovations in Fiber and Textile Reinforced Concrete in Support of Sustainable Infrastructure Systems

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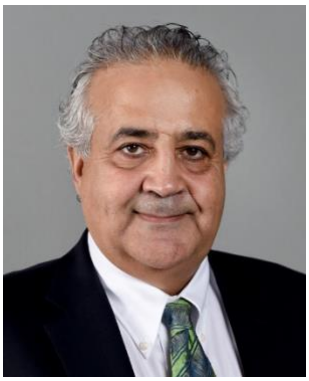
Abstract

The life cycle costs of structural systems depend on raw materials, labor, energy, environmental impact, serviceability, and durability. As these parameters change due to innovations in technology, alternative construction systems become cost competitive. This talk presents an overview of recent developments in cement-based composites such as fiber-reinforced concrete, textile reinforced concrete (TRC), and UHPC as sustainable materials for construction industry. Textile reinforced concrete (TRC) is a new class of composite materials with superior tensile strength and ductility for use as load bearing structural members. The influence of textile type, matrix modification and processing parameters on the damage evolution under tensile and flexural loading is discussed. The presentation also addresses the development of generalized design tools for sustainable construction systems such as segmental tunnel linings or hybrid fiber reinforced concrete materials. Both material and structural design are concurrently accomplished. Analytical closed form solutions for serviceability based design and analysis of composite systems such as beams, and slabs as 1-D and 2D elements are used. Experimental, results for a variety of experiments are used to verify the model using steel reinforced concrete, concrete reinforced with steel and glass fiber reinforced plastic (GFRP), TRC, and Natural fiber composites.

Biography



Barzin Mobasher obtained his BS, MS, and PhD. in Civil Engineering from University of Wisconsin-Platteville, Northeastern University, and Northwestern University in 1983, 1985, and 1990 respectively. After a brief two-year career in Industry, he joined Arizona State University in 1991 as Assistant Professor of Structural Materials. He has been a professor of engineering at the School of Sustainable Engineering and Built Environment at ASU since 2004. Dr. Mobasher has led programs involved with the design, analysis, materials testing, and full-scale structural testing of construction, structural, and aerospace materials. His publications include two books on fiber and textile reinforced concrete, three edited books, and more than 150 research papers in leading professional journals and conference proceedings. His fundamental contributions in fiber and textile reinforced concrete materials and mechanics of toughening in UHPC cement based systems, durability modeling, and experimental mechanics. He has served as the Chair of American Concrete Institute, ACI committee 544 on Fiber Reinforced Concrete, and is currently serving Technical Committees of both ACI and RILEM.

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