Ομιλητής: **Professor Antonios Kontsos**

Dept. Mechanical Engineering & Mechanics, Drexel University, Philadelphia USA

Θέμα: **Digital Twinning for Intelligent Material & Structural Design**

Περίληψη:

Two relatively recent Science and Technology advancements allow a renewed viewpoint in understanding structure-properties-behavior relationships that span several time and length scales and apply to both materials and structures. First, the widespread use of sensing, testing and characterization equipment capable of zooming into the structure of matter or capture 3D geometry with unprecedented resolution by leveraging advances in imaging, signal processing and machine learning. The second relates to the development of numerical methods coupled with modern high performance and cloud computing that are capable of simulating e.g. physical processes or modeling dynamically evolving and complex effects using statistical and probabilistic methods. These developments have created the appropriate framework for what is now referred to as "Digital Twinning" (DT) which promises a paradigm shift in the way we understand the built environment and design applications. In this context, the talk will present some of the attributes of the DT concept that my research group has been focusing on, through examples related to multimodal and multiscale sensing as well as data-driven modeling in the context of investigations of evolving material, structural and system behavior.

Ημερομηνία: **Τρίτη 20 Απριλίου 2021**

Ώρα: **18:00**

Link:

https://upatras-gr.zoom.us/j/99559317588?pwd=Tk0zeWJQZEpYVjA5TU96bCtmZytWZz09

Βιογραφικά στοιχεία:

Dr. Antonios Kontsos is an Associate Professor in the Mechanical Engineering & Mechanics Department at Drexel University where he is currently the Director of the Theoretical and Applied Mechanics Group (TAMG). He received his undergraduate 5-year Diploma (2002) in Mechanical Engineering & Aeronautics from University of Patras (Greece), and his M.S (2005) and Ph.D.

(2007) degrees in Mechanical Engineering & Materials Science from Rice University (Houston, TX). Before joining Drexel in 2009, Dr. Kontsos held a post-doc position at the Center for Mechanics of Solids, Structures and Materials in the Aerospace Engineering & Engineering Mechanics Department at the University of Texas at Austin (Austin, TX). Dr. Kontsos's primary research interest is in the theoretical, experimental and computational investigation of the mechanical behavior of materials with emphasis on understanding microstructure-properties-behavior evolving relationships.

Description of Research Area:
Dr. Kontsos' primary research interests are in the area of theoretical and applied mechanics with emphasis on the understanding of the mechanical behavior of materials. To achieve this goal, he has been developing approaches based on multiscale microstructure-properties-behavior relations using methods that involve theory, experiments, modeling and simulations. A fundamental goal of this type of research is the understanding of the deformation and failure of advanced materials in terms of their multiscale architecture and their constitutive response with applications in materials design. An additional research goal is the identification of damage and in particular the quantification of evolving material states as a function of applied loading, which can then be used for prognosis of remaining useful life. In this context, Prof. Kontsos has been using sensing and testing methods in plasticity, fracture and fatigue investigations across length scales in conjunction with signal processing and numerical simulation approaches that could assist both the fundamental understanding of the mechanical behavior of materials as well as their applications. In relation to these research efforts, Dr. Kontsos teaches topics related to solid mechanics, advanced manufacturing and cyberphysical systems.

Research Website: http://www.mem.drexel.edu/tamg/
Personal Website: https://drexel.edu/engineering/about/faculty-staff/K/kontsos-antonios/