UNIVERSITÀ DEGLI STUDI DI PERUGIA

DICA DIPARTIMENTO DI INGEGNERIA CIVILE E AMBIENTALE DIPARTIMENTO DI ECCELLENZA

STRUCTURAL, SEISMIC, HYDRAULIC AND GEOTECHNICAL ENGINEERING, ARCHITECTUREAND ENVIRONMENTAL SCIENCES

CIVIL AND ENVIRONMENTAL ENGINEERING

DOCTORAL PROGRAM

STOCHASTIC PROCESSES AND EXTREME RARE EVENTS

MODULE 1
MODELING AND SIMULATION OF STOCHASTIC PROCESSES

Instructors:
Massimiliano Gioffrè, Ph.D., Associate Professor, UniPG
Chiara Pepi, Ph.D., Research Fellow, UniPG (Section 4)

Course Description: This module is aimed to provide the fundamentals of modeling and simulation of stochastic processes and fields. The module is organized in four Sections where practical work and lessons in theory are alternated. It covers both introductory and advanced topics in random functions, including stationary and non-stationary models, Gaussian and non-Gaussian models, Monte Carlo simulation, polynomial chaos.
Classroom practical work using programming software is proposed to deepen inside the proposed theory.

MODULE SCHEDULE

January, 19th 2021 - 09:00-11:00
Section 1: Fundamentals on Random Functions
_ Stochastic processes and fields
_ Stationary and non-Stationary models

January, 21st 2021 - 09:00-11:00
Section 2: Gaussian and non-Gaussian Models
_ Weakly-Stationary stochastic processes and vectors
_ Second moment characterization and Gaussian processes
_ Translation processes

January, 22nd 2021
Section 3: Monte Carlo Simulation
_ 09:00-11:00 Generation of random numbers
_ 15:00-17:00 Generation of Gaussian samples

January, 25th 2021 - 09:00-11:00
_ Generation of samples from assigned distribution

January, 27th 2021 - 09:00-11:00
_ Correlation-based simulation

January, 29th 2021 - 09:00-11:00
_ Spectral density-based simulation

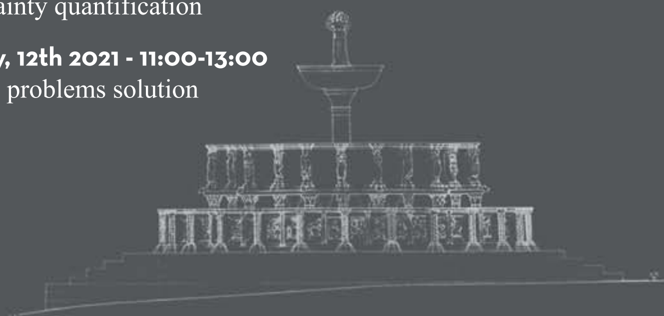
February, 10th 2021 - 11:00-13:00
Section 4: Polynomial chaos expansion
_ Uncertainty quantification

February, 12th 2021 - 11:00-13:00
_ Inverse problems solution

Massimiliano Gioffrè is Associate Professor in Structural Mechanics at Perugia University, Department of Civil and Environmental Engineering. He is chair of the Master degrees in Civil Engineering and Building-Architecture Engineering at Perugia University. He is vice-Director at CRIACIV (Italian Inter-university Research Center in Construction Aerodynamics and Wind Engineering. He received his Ph.D. in Structural Engineering from Firenze University. He was a one-year visiting researcher at Cornell University in 1998 and cooperated with NIST.
Massimiliano was Associate Professor at Syracuse University, School of Architecture, in 1999, teaching the classes Introduction to Structures and Advanced Structures. He is currently leading research projects funded by the European Community (PSR) and local Institutions (Umbria Region, FCRPG). His research yielded chapters in books and more than 150 papers in the field of Stochastic Mechanics, Wind Engineering, Structural Identification, Structural Optimization and Structural Health Monitoring.

Location: Campus of Engineering of University of Perugia
Latitude: 43.118177 Longitude: 12.357942

Timetable: January 19, 21, 22, 25, 27, 29 - 09:00 a.m.
February 10, 12 - 11:00 a.m.
Room 1 (CEEPhD Team)



For more info: Ph.D. Program Secretariat (Mrs. Teresa Nocera, teresa.nocera@unipg.it)
Ph.D. Program Coordinator (Prof. Dr. Filippo Ubertini, filippo.ubertini@unipg.it)

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