New Frontier of Education and Research in Wind Engineering

MAJOR RESEARCH ACTIVITIES

1. <u>JSPS research project</u>: Stochastic analysis of multi-degree-offreedom systems equipped with nonlinear viscous dampers.

<u>Objective</u>: defining a procedure for optimal distribution of viscous dampers in multi-degree-of-freedom structures subjected to random wind loads with assigned Power Spectral Density function.

- <u>Methods</u>: two different approaches are been analyzed at the moment.
- a) Stochastic analysis by means of Statistic Linearization Technique
- b) Stochastic analysis by means of Fractional Calculus based on recent developments in the field of Stochastic differential calculus



Name and Stand Giorgio Barone JSPS Researcher

Hometown Palermo, Italy

Profile Studv

I earned Ph.D degree in structural engineering at Università degli Studi di Palermo in 2009 under the supervision of Professor M. Di Paola.

Work

In 2007 I have attended the University of Illinois at Urbana Champaign as a visiting scholar under the supervision of Professor L. Bergman.



MAJOR RESEARCH ACTIVITIES

2. Analysis of shear stresses distributions in Saint Venant beams subjected to shear forces and torsional moments by means of Complex Variable Methods.

<u>Objectives</u>: development of new solutions for generic shaped crosssections. Analysis of advantage and disadvantages of different methods in literature.

Methods:

- a) The Line Element-less Method has been developed for the solution of problems governed by Laplace equation. The method is based on the expansion in Laurent series of a properly defined potential function and it is characterized by the fact that doesn't require any discretization of neither the domain or the boundary of the cross-section.
- b) A comparison with results obtained with other complex variable methods has been carried out. In particular analysis have been performed with the Complex Variable Boundary Element Method and Complex Polynomial Method.

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The title of my Ph.D thesis is "Complex potential and boundary methods for shear stresses in Saint Venant problems. Line Element-less Method".

During past years I have also researched on different topics such as linear and nonlinear structural dynamics, analysis of structures subjected to stochastic excitations, damage identification and structural vibration control, dynamic experimental tests, and also have some experience in teaching in Palermo.

As a visiting scholar in Urbana-Champaign, I worked on an application of Nonlinear Energy Pumping theory to an analytic model of bluff body.

I am interested in different research topics in the environment of structural engineering. I had the opportunity of studying with eminent figures both in the field of seismic and wind engineering.

Now I am really thankful to JSPS and Tokyo Polytechnic University for giving me the opportunity to join this research institute and to experience research life in Japan.