OpenSees Days Portugal 2014

Workshop on Multi-Hazard Analysis of Structures using OpenSees
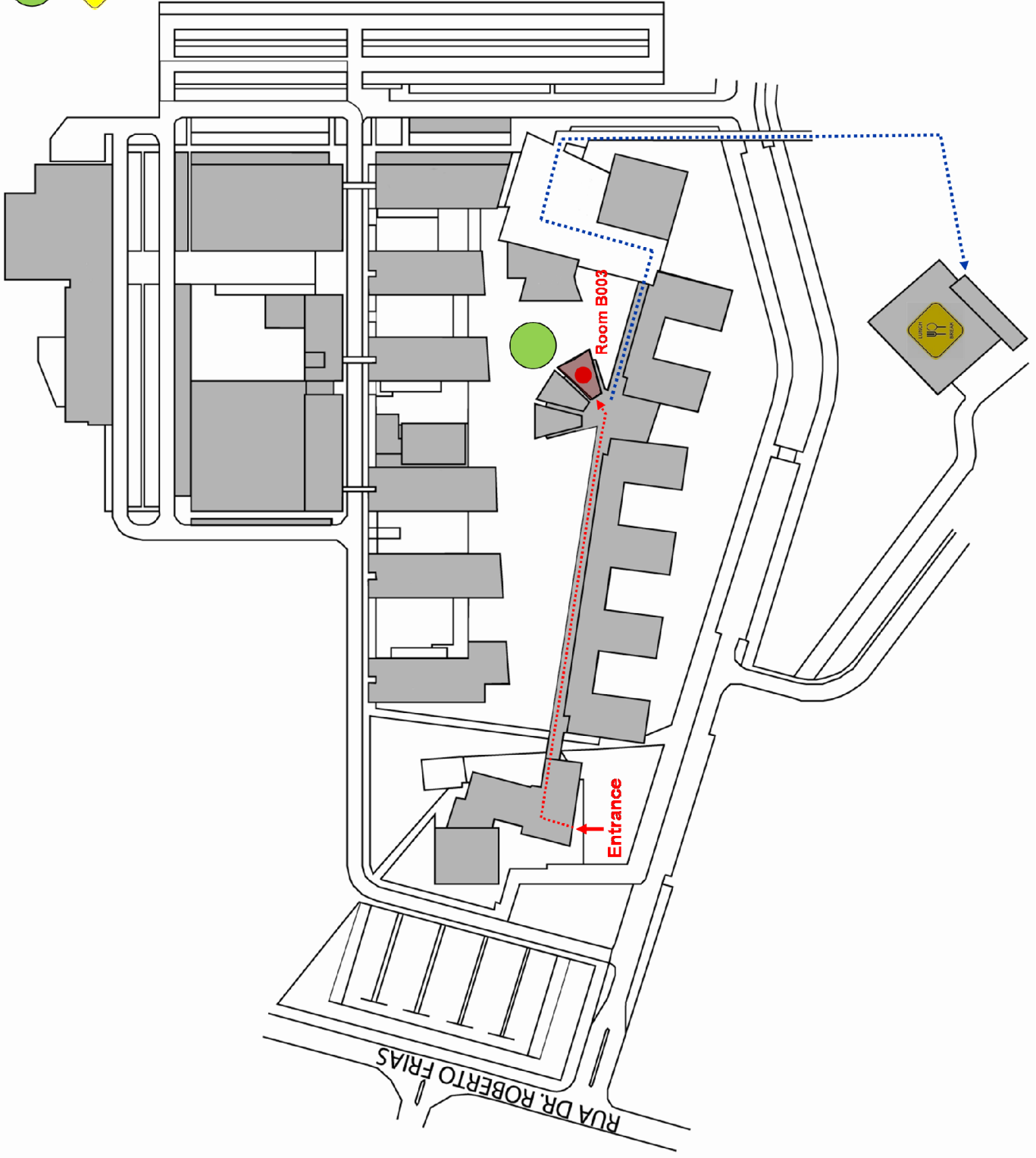
July 3-4

Faculty of Engineering of the University of Porto

Coffee Break Area

Lunch

Room B003

Entrance

RUA DR. ROBERTO FRIAS

Welcome Message

Dear Participant,

The OpenSees Days Portugal 2014 Organizing Committee would like to welcome you to Portugal, to Porto and to the Faculty of Engineering of the University of Porto (FEUP). The OpenSees Days workshop is being held in Portugal for the first time and follows successful workshops held previously in Italy (2011), China (2012), and U.K. (2014). In the U.S.A. this workshop is organized every year. We are honoured to host this workshop at the campus of the FEUP and to welcome Dr. Frank McKenna, OpenSees founder, and the remaining lecturers, as well as some of the more active European developers.

The OpenSees Days Portugal aims to gather new users and assemble the OpenSees community in Europe to discuss some of the new features. The first day, entitled Getting Started With OpenSees is intended to give a major overview of the main features of the software, starting from a basic introduction to the structure of the program, introducing some basic tools and interpreter related issues. This is followed by a basic introduction to nonlinear analysis, with simple illustrations being given.

Several earthquake induced multi-hazard analyses using OpenSees are then addressed, such as blast analysis, fire analysis, and seismic analysis of structures. The use of parallel processing, HTC and HPC, which are of major importance due to the complexity of most of the systems required to perform multi-hazard analysis, are also presented. The first day ends with a video conference on the OpenSees Geotechnical features, delivered by one of its main developers, Prof. Pedro Arduino from the University of Washington, U.S.A.

The second day is essentially composed by the presentation of multiple case study examples. The first lecture, delivered by Dr. Frank McKenna, focus on adding code to the OpenSees framework, while the following lectures will be given by the participants of the workshop. The main goal of these presentations is to share recent developments, outcomes, challenges and to raise a fruitful discussion between the participants. In addition to the lectures given by Dr. Frank McKenna, Dr. André Barbosa, Prof. Asif Usmani, Dr. Lauren Stewart, and Prof. Pedro Arduino,

a total of 12 presentations will be made at the workshop by authors from 7 different countries.

The remaining participants, approximately 40, come from 10 different countries. We are pleased to host such an inter-cultural workshop and hope that this serves as opportunity to launch new partnerships.

The abstracts will be sent by email after the event. The conference programme, provided in this document, should help you in following the workshop.

We would like to thank all the funding institutions that have made this workshop possible. We would also like to thank all lecturers, participant authors, general participants, and students for their contribution to the workshop. A special word of thanks goes to all who actively collaborated in the organization of this event at FEUP and to the secretariat of "Instituto da Construção" for their considerable help.

We sincerely hope you have a stimulating and fruitful workshop and wish you a very pleasant stay in Porto.

The Organizing Committee

Xavier Romão
José Miguel Castro
André Barbosa
Nuno Pereira
Filipe Ribeiro
Luís Macedo
Rita Peres

Venue

The OpenSees Days Portugal 2014 will take place at the Faculty of Engineering at the University of Porto (FEUP). The faculty is located at rua Dr. Roberto Frias in Porto. The city of Porto is accessible from abroad through several direct airlines service to Francisco Sá Carneiro International Airport, located about 12 Km from the city centre.

To get to the Workshop Location (FEUP) from the city centre:

The best way to reach FEUP is by subway. Take the yellow line (D) of the subway, direction to Hospital S. João. You can take trains in this line in the city centre, namely in S. Bento, Aliados and Trindade stations. The closest station to FEUP is IPO which is within walking distance to FEUP. Just follow Dr. Plácido da Costa Street and at the end of the avenue you will find the FEUP campus.

Taxi service

Several taxi services are available in Porto:

RadioTaxi	Taxis Invicta
00351 225073900	00351 22 507 6400
00351 969661666	00351 912 301 251
00351 917555085	00351 934 772 173
00351 935073900	00351 968 520 063

Parking in and near the FEUP Campus:

It is usually very hard to get a free parking place in the vicinity of FEUP campus.

Workshop location

The Workshop will be held at the Faculty of Engineering of the University of Porto, in room B003, which is located in the main building (B) of the campus.

Coffee breaks

Coffee breaks take place during the hours mentioned in the workshop programme. Locations of the coffee break are indicated on the venue plan of FEUP.

Lunch breaks

Lunches are included in the conference registration fee, and they will be served at the canteen of the Faculty, close to FEUP, as indicated on the venue plan of FEUP.

Wireless Network

A wireless network is available which can be used over all the campus of FEUP. All participants receive a personal user-id, password, and instructions to connect to the network upon registration.

To access to the network from a computer running Windows:

1) Click on the network connections icon that is available on the inferior right side of the screen.

2) Select the "feup.conferencias" options and press "Connect";

3) Next, open an internet browser (Explorer, Mozilla, Chrome, etc.). And if a message appears on the screen, you will have to select the "Proceed to website" option;

4) Select "Conferencias" option

5) Click on "login" and enter the supplied credentials
> **User:** openseespt
> **Password:** feupopen
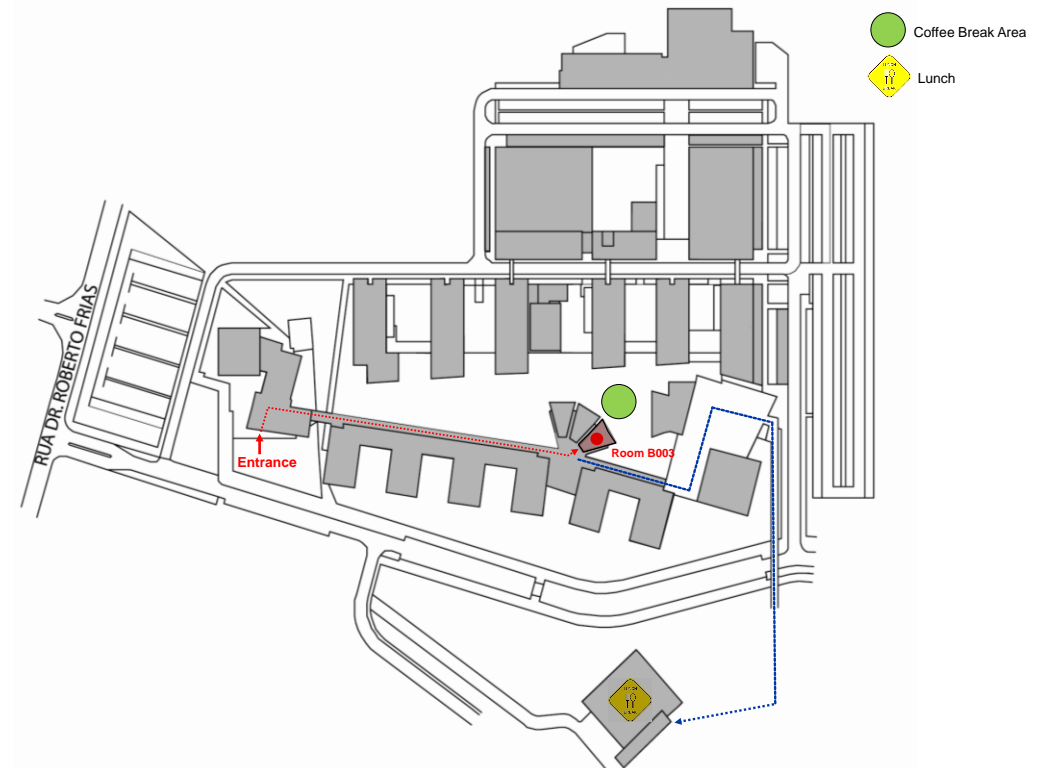
Abstracts and Presentations

The abstracts of all the presented contributions will be sent by email to all the registered participants.

Depending on the availability of the authors, the presentations will be also posted on the website of the workshop.

Thursday 03 July 2014

Getting Started with OpenSees on Earthquake induced Multi-Hazard Analysis

Morning Session

Chairs: José Miguel Castro

Time	Subject	Authors	Affiliation
9:00 – 9:15	Opening Session	**Rui Faria, José Miguel Castro** André Barbosa	*University of Porto, Portugal* *Oregon State University, USA*
9:15 – 9:30	Introduction to OpenSees	**Frank McKenna**	*University of California Berkeley, PEER, USA*
9:30 – 10:00	OpenSees and Tcl	**Frank McKenna**	*University of California Berkeley, PEER, USA*
10:00 – 10:30	Coffee Break		
10:30 – 11:00	Modelling in OpenSees	**Frank McKenna**	*University of California Berkeley, PEER, USA*
11:00 – 11:30	Nonlinear Analysis	**Frank McKenna**	*University of California Berkeley, PEER, USA*
11:30 – 12:00	Basic Examples	**Frank McKenna**	*University of California Berkeley, PEER, USA*
12:00 – 13:30	Lunch		

Afternoon Session

Chairs: André Barbosa

Time	Subject	Authors	Affiliation
13:30 – 14:00	Modelling Structures Subjected to Blast Loads	**Lauren Stewart** Stephen Hsu	*Georgia Institute of Technology, USA*
14:00 – 14:30	An integrated computational environment for simulating structures in real fires	**Asif Usmani**, Liming Jiang Jian Jiang, Guo-Quiang Li, Suwen Chen	*University of Edinburg, UK* *Tongji University, Shanghai, China*
14:30 – 15:00	Dynamic Analysis With Examples – Seismic Analysis	**André Barbosa**	*Oregon State University, USA*
15:00 – 15:30	Coffee Break		
15:30 – 16:00	Parallel Processing & NEEShub	**Frank McKenna**	*University of California Berkeley, PEER, USA*
16:00 – 16:30	Uncertainty and Sensitivity Analysis using HTC and HPC	**André Barbosa**	*Oregon State University, USA*

Presentation delivered through video conference

16:30 – 17:30	Geotechnical Modelling with Examples	**Pedro Arduino**	*University of Washington, USA*
17:30	*Closure Day 1*		
17:30 - 18:00	Visit to the Laboratory for Earthquake and Structural Engineering (LESE) @ FEUP		

Friday 04 July 2014			
Beyond the Basics			
Morning Session (ROOM B003)			
Chairs: Filipe Ribeiro			
Time	**Subject**	**Authors**	**Affiliation**
8:45 – 9:00	Opening Session	**André Barbosa**	*Oregon State University, USA*
9:00 – 9:50	Adding Your code to OpenSees	**Frank McKenna**	*University of California Berkeley, PEER, USA*
9:50 – 10:10	Steel4 - A Versatile Uniaxial Material Model for Cyclic Nonlinear Analysis of Steel-based Elements	**Ádám Zsarnóczay** László Gergely Vigh	*Budapest University of Technology and Economics*
10:10 – 10:30	OpenSees as an Engine for Web-based Applications	**Yadong Jiang** Rui Barros José Miguel Castro	*University of Porto, Portugal*
10:30 – 11:00	Coffee Break		
11:00 – 11:20	Seismic Loss and Downtime Estimates of Existing Tall Buildings and Strategies for Increased Resilience	**Carlos Molina Hutt** Ibrahim Almufti Michael Willford Gregory Deierlein	*University College London, London, UK* *Advanced Technology + Research, Arup, SF, CA, USA.* *Advanced Technology + Research, Arup, SF, CA, USA.* *Stanford University, Stanford, CA, USA.*
11:20 – 11:40	Numerical simulations of liquefaction phenomena after Emilia Romagna (20 May 2012) earthquake	**Davide Forcellini** S. Gobbi G. Guerra	*Università di San Marino, San Marino*
11:40 – 12:00	Deterioration Modelling of Steel Moment Resisting Frame Using Finite-Length Plastic Hinge Force-Based Beam-Column Elements	**Filipe L.A. Ribeiro** André Barbosa Luís Neves	*New University of Lisbon, Portugal* *Oregon State University, USA* *University of Nottingham, U.K.*
12:00 – 13:30	Lunch		
Afternoon Session			
Chairs: Frank McKenna			
13:30 – 13:50	Application of OpenSees in Reliability-based Design Optimization of Structures.	**Luis Celorrio-Barragué**	*University of La Rioja, Logroño, Spain*
13:50 – 14:10	A Simplified Damage-following Model for Reinforced Concrete Columns	**Nuno Pereira** Xavier Romão	*University of Porto, Portugal*
14:10 – 14:30	Multi Modal response Spectrum Analysis implemented in OpenSees	**József Simon** László Gergely Vigh	*Budapest University of Technology and Economics*
14:30 – 14:50	Deteriorating Hysteresis Model for Cold-formed Steel Shear Wall Panel based on Physical and Mechanical Characteristics	**Smail Kechidi** N. Bourahla	*University of Blida, Algeria*
14:50 – 15:10	Numerical Modelling of Masonry Infill Walls Participation in the Seismic Behaviour of RC Buildings	André Furtado **Hugo Rodrigues** António Arêde	*University of Porto, Portugal* *Instituto Politécnico de Leiria, Portugal* *University of Porto, Portugal*
15:10 – 15:30	Progressive Collapse Estimation of Reinforced Concrete Buildings	**Abdolreza S. Moghadam** Somayyeh Karimiyan	*International Institute of Earthquake Engineering and Seismology (IIEES), Iran*
15:30 – 15:50	Numerical Simulation of the Seismic Behaviour of RC Bridge Populations for Defining Optimal Intensity Measures	**Claudia Zelaschi** Ricardo Monteiro Mário Marques	*UME School, IUSS Pavia, Italy* *University of Porto, Portugal* *University of Porto, Portugal*
15:50 – 16:00	Closure		

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