UNIVERSITA' DEGLI STUDI DI NAPOLI FEDERICO II

DIPARTIMENTO DI STRUTTURE PER L'INGEGNERIA E L'ARCHITETTURA
CORSO DI DOTTORATO DI RICERCA IN
INGEGNERIA STRUTTURALE GEOTECNICA E RISCHIO SISMICO

XXXVI CICLO

La sottoscritta prof. Beatrice Faggiano (RU) afferente al Dipartimento di Strutture per l'Ingegneria e l'Architettura S.S.D. ICAR/09 Tecnica delle Costruzioni

CHIEDE

di essere inserito tra i possibili tutor di studenti di dottorato per il XXXVI ciclo.

1. Curriculum sintetico del proponente (max 500 parole)

ACADEMIC CAREER:
2001 Doctoral degree in Structural engineering at UNINA.
Since 2005 Assistant professor in Structural Engineering.
Since 2013 Qualified as Associate professor in Structural Engineering.

- Teaching posts in national and international II level masters in the domains of Metallic Structures, Timber constructions, Glass Engineering.
- Tutor for more than 80 degree thesis, 8 PhD thesis and 6 visiting foreign students.
- Member of the professor councils for the II level master courses in the domain of civil engineering, member of the Erasmus Commission for DiSt, tutor inside the Professor Council of the PhD Course in "Construction Engineering" at UNINA; Member of CNR (Research National Council) Committees for design, construction and testing of timber structures and for elements made of glass.
- Responsible of 8 Erasmus bilateral agreements with European universities.

RESEARCH ACTIVITY:

- Research areas: Structural Engineering, Submerged Floating Tunnel, steel, timber structures, Earthquake engineering, vulnerability of historical and monumental buildings against exceptional actions.
- Author of more than 245 papers in national and international journals, conference proceedings, technical documents, monographs.

OTHER ACHIEVEMENTS:

- Member of organizing and scientific committees of International Conferences, also co-editor of proceedings; Behaviour of Steel Structures in Seismic Areas STESSA; Earthquake Protection of Historical Buildings by Reversible Mixed Technologies PROHITECH; COST Action C26 Urban Habitat Constructions under Catastrophic Events; Steel and Composite Structures EUROSTEEL; SHATIS Structural health assessment of timber structures; SUFTUS Submerged Floating Tunnels and

Underwater Tunnel Structures.

- Organizer and chairman of special sessions and minisimposia, in International Conferences, on submerged floating tunnels (9th International Conference on Bridge Maintenance, Safety and Management, IABMAS 2018, 2020; 14th International Conference on Vibration Problems, ICOVP 2019), as well as on timber structures (5th International Conference on Structural Health Assessment of Timber Structures, SHATIS'19).
- Responsible (with prof. Raffaele Landolfo) of the international trilateral agreement for Cooperation, in the field of Structural Engineering and in particular in the field of Submerged Floating Tunnel, among Korea Advanced Institute of Science and Technology (Research Center for Smart Submerged Floating Infrastructural Systems), Zhejiang University (Research Center for Submerged Floating Tunnel) and the University of Naples, Federico II (Department of Structures for Engineering and Architecture).
- Participant to national and international research projects, also as research responsible.
- Participant to national and international conferences as speaker, chairman and invited lecturer.
- Lecturer within national and international specialized courses.
- Referee for national and international journals, research projects and conference proceedings.

EXHIBITION

05/2017 Engineering: Archimedes Bridge, a submerged floating tunnel. TDW2017 Tianjin International Design Week 2017: The future is now. Beining cultural creative center, Italian Pavilion.

AWARD

2018 Wibe Prize - best ranked 30 Papers among 200. Paper title The submerged floating tunnel: a new frontier for strait crossings, B. Faggiano, G. Iovane, R. Landolfo, F. M. Mazzolani

2. Dottorandi dei quali il proponente è stato tutor nell'ultimo triennio	
n. 1	*Giacomo Iovane* *tipologia di borsa: ateneo*

3. Titolo della ricerca proposta
Seismic resistant heavy timber structures

4. Area tematica
Ingegneria Geotecnica □ Ingegneria Strutturale X Rischio Sismico □

5. Sintesi del progetto di ricerca (max 500 parole. Stato dell'arte, obiettivi e breve programma previsto per le attività e)
The interest of the scientific community to timber structures in seismic areas is enhanced nowadays, as it is testified by the research activities carrying on worldwide, like in Italy, Portugal, Canada, New Zealand, Japan, devoted to either experimental test campaigns on timber structural systems and nodal assemblages, or numerical modelling and structural capability evaluation. The acquired knowledge and technology of timber engineering allows to introduce seismic resistant timber multistory multispan buildings, with moment resisting frames and concentric or eccentric braced frames, as well as shear wall, concrete wall and concrete core frames. These structural systems are widely used and consolidated in the anti-seismic steel constructions, which have the similarity with timber constructions to be assemblage of members through appropriate joints, even though steel and timber are different materials for origins and mechanical properties. In fact timber material has an elastic and fragile behavior up to failure, so that, in order to comply with the current approach to the seismic design of dissipative structures, the common view is that joints should be dissipative through plastic deformations of metallic connectors. This is up to now indicated in the present anti-seismic regulations, such as in Europe the Eurocode 8. However, joints are primary structural elements, with a crucial role in bearing the design loads, therefore the dissipation function should be assumed by ad hoc conceived dissipation devices, as an alternative to connections. In line with this, capacity design concepts, for seismic moment resisting and bracings timber frames, both not dissipative and dissipative ones, can be adapted and applied to timber structures. In particular, the capacity design rules can be applied by means of the component method, through the definition of collapse hierarchy criteria, allowing to preserve the timber beam and the joint subcomponents from damage. Moreover the dissipation capabilities of structures equipped with seismic devices can be evaluated, aiming at the determination of the corresponding behaviour q-factors. This is the object of the research study, with the aim to define structural types, constructional details and design criteria for timber seismic resistant structures, as a background study for the

preparation of design guidelines. In particular the focus is on heavy timber frames equipped with ductile steel links and fluid viscous dampers. The project can be articulated in the following main tasks:

1. State of art
2. Joints: conception of archetypes, design, modelling, numerical vs experimental tests
3. Timber frames with steel links: conception of archetypes, design, modelling, parametric seismic analysis of multistory frames
4. Timber frames with FVD: conception of archetypes, design, modelling, parametric seismic analysis of multistory frames
5. Definition of the design criteria
6. Preparation of guidelines for the design of seismic resistant heavy timber structures.

6. Eventuali pubblicazioni del tutor sul tema di ricerca (max 10)

Accepted Abstract. Faggiano B., Iovane G., Noviello C., Mazzolani F. M., Landolfo R.. Beam-to-column joint with steel link for timber structures: system optimization through numerical investigations and design criteria. World Conference on Timber Engineering (WCTE 2020), 24-27 August 2020, Santhiago, Chile.

2019 Faggiano, B., Iovane G., Salzillo D., Mazzolani F. M., Landolfo R.. Dissipative bracing systems for seismic upgrading of new and existing timber structures. In 5th International Conference on Structural Health Assessment of Timber Structures (SHATIS 2019), Universidade do Minho, Escola de Engenharia, Guimarães, Portugal, ISBN 978-989-54496-2-0, 25-27, pp. 1042-1052.

2019 Calderoni B., Bedon C., Ceraldi C., Faggiano B., Follesa M., Fragiacomo M., Gattesco N., Giubileo C., Gubana A., Iovane G., Lauriola M. P., Martinelli E., Pizzo B., Podestà S., Sandoli A.. The instructions for the design, execution and control of timber construction (CNR-DT 206 R1/2018). In XII National Conference ANIDIS The seismic Engineering in Italy, PISA University Press, Pisa, Italia, ISBN 978-88-3339-256-1, paper SG08-2, pp. 1057-1065.

2019 Faggiano B., Iovane G., Tartaglia R., Ciccone G., Landolfo R., Mazzolani F.M., Andreolli M., Tomasi R., Piazza M.. Numerical simulation of monotonic tests on beam-column timber joints equipped with steel links for heavy timber seismic resistant MRF. 16th International Conference of Numerical analysis and Applied Mathematics, ICNAAM 2018, AIP Conference Proceedings 2116, 260017 (2019); https://doi.org/10.1063/1.5114268

2018 Masse A., Faggiano B., Fournely E., Iovane G., Mazzolani F. M., Bouchaïr A.. On the seismic vulnerability assessment of timber and steel large-span structures. Proceedings of 2018 World Conference on Timber Engineering (WCTE2018), August 20-23, Seul, Republic of Korea.

2018 CNR 2018 Committee. "Instruction for the design, execution and control of timber structures". CNR-DT 206-R1/2018". Technical document, Roma – CNR (in Italian).

2017 Faggiano B., Iovane G., Sinapi G., Mazzolani F.M., Landolfo R.. Seismic behaviour of timber portal frames with steel dissipative links. ReLUIS-2017-PR4_Allegato_22-UR_UNI-NAb. Research project DPC – ReLUIS 2017 PR4 - Timber Structures.

2016 Faggiano B., Iovane G.. First considerations on the design approach and criteria for seismic resistant moment resisting and bracings timber frames. In World Conference on Timber Engineering, WCTE2016, CD-ROM. Publisher: Vienna University of Technology, Austria, ISBN:

978-3-903039-00-1. Full paper ID1094.

2015 Faggiano B., Iovane G. Seismic resistant heavy timber structures: moment resisting and braced frames. ReLUIS-2015-PR4_Allegato_01-UR_UNI-NA. Research project DPC – ReLUIS 2015 PR4 - Timber Structures. (In Italian)

2014 Reluis guidelines. "Instruction for the design, execution and control of timber structures". ReLUIS-2014-PR4_Allegato_17. Research project DPC – ReLUIS 2014 PR4 - Timber Structures.

7. Eventuali progetti di ricerca finanziati in cui l'attività si inserisce

The research activity is included in the DPC/RELUIS Project 2019/2021 – WP13. Contribution to standards for timber structures.

8. Eventuali fondi disponibili a supporto dell'attività del dottorando (escluso finanziamento borse)

The research activity can be supported by the cooperation with the University of Minho (Portugal) that in last months has hosted the experimental campaign on timber beam-to-column joints with steel links, partially funded by the Portilame company.

9. Informazioni relative ad un periodo di ricerca all'estero (minimo tre mesi) previsto per il dottorando (indicare Università/ente di ricerca e docente/ricercatore di riferimento con indirizzo mail) (max 300 parole)

Study periods at the University of Minho aiming at carrying out the experimental activity on joints assemblage or structural systems can be planned during the PhD course. Other opportunities can be also evaluated.

10. Eventuali collaborazioni con imprese/aziende sul tema di ricerca (max 300 parole)

The Rubner Holzbau Sud company has just signed an agreement for traineeship, demonstrating the interest in cooperation.

Napoli, 13/02/2020 FIRMA

Beatrice Faggiano

Il presente modulo va compilato in ogni sua parte ed inviato all'indirizzo di posta elettronica phd.dist@unina.it entro e non oltre **venerdì 14/02/2020**.