

Antonio Pio Sberna

Curriculum vitæ

Department of Structural, Geotechnical
and Building Engineering
Politecnico di Torino
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*PhD student of Civil and Environmental
Engineering (Structural Engineering)*

Personal information

Place and date of birth Enna (Italy), February 10, 1994
Language skills Italian (native), English (fluent)
Citizenship Italian
Professional qualification Professional licensed engineer qualified on 2nd national exam 2020
Member of the Engineering Chamber of Enna (Italy) numb. 856

Education

Nov 2020 – present **PhD in Civil and Environmental Engineering**, *Politecnico di Torino*.
Research interest: *Optimization of seismic retrofitting interventions of non-ductile existing structures*.
Advisors: Prof. Giuseppe Marano and Prof. Fabio Di Trapani

Oct 2017 – Jul 2020 **MS in Civil Engineering**, *Politecnico di Torino*.
Master thesis (in english): *Optimal seismic retrofitting of reinforced concrete buildings by steel-jacketing using a genetic algorithm-based framework*
Advisors: Prof. Fabio Di Trapani and Prof. Giuseppe Marano

Oct 2013 – Apr 2017 **BS in Civil Engineering**, *Università degli studi di Catania*.
Bachelor thesis (in italian): *Influenza dello sforzo normale sul collasso plastico di strutture intelaiate (Effect of axial load on the plastic collapse of frame structures)*
Advisor: Prof. Annalisa Greco

Publications on international journals

1. Di Trapani F., Malavisi M., Marano G.C., **Sberna A.P.**, Greco R. "Optimal seismic retrofitting of reinforced concrete buildings by steel-jacketing". *Engineering Structures*, 2020; 219:110864.
2. Di Trapani F., **Sberna A.P.**, Marano G.C. "A new genetic algorithm-based framework for optimized design of steel-jacketing retrofitting in shear-critical and ductility-critical RC frame structures". *Engineering Structures*, 2021; 246:112684.
3. Di Trapani F., Vizzino A., Tomaselli G., **Sberna A.P.**, Bertagnoli G. "A new empirical formulation for the out-of-plane resistance of infilled reinforced concrete frames without prior in-plane loading". *Engineering Structures*, 2022; 266:114422.
4. Di Trapani F., **Sberna A.P.**, Marano G.C. "AI-based optimization framework for the design of seismic retrofitting of reinforced concrete frame structures based on direct costs and EAL". *Computers and Structures*, 2022; 271:106855.
5. Di Trapani F., **Sberna A.P.**, Di Benedetto M., Villar S., Demartino C., Marano G.C. "Dynamic progressive collapse response of multi-storey frame structures with masonry infills". *Structures*, 2023; 54:1336-1349.
5. **Sberna A.P.**, Demartino C., Vanzi I., Di Trapani F. "Cost-effective topology optimization of masonry structure reinforcements by a linear static analysis-based GA framework". *Bulletin of Earthquake Engineering*, 2023; *in-press*.

Conference proceedings

1. Di Trapani F., Malavisi M., Marano G.C., **Sberna A.P.** "Genetic algorithm-based optimization of RC frame structures retrofitting with steel jacketing". *IWSS2020 – 1st Italian Workshop on Shell and Spatial Structures*, web meeting, June 2020
2. Di Trapani F., **Sberna A.P.**, Tomaselli G., Marano G.C. "Cost-based and EAL based optimization algorithms for seismic retrofitting of RC frame structures". *Italian Concrete Days 2020 - Costruire in calcestruzzo realizzazione, ricerca, attualità e prospettive*, web meeting, April 2021.
3. Di Trapani F., **Sberna A.P.**, Marano G.C. "Cost and EAL based optimization for seismic reinforcement of RC structures". *IGF26 - 26th International Conference on Fracture and Structural Integrity*, Turin (Italy), May 2021.

4. **Sberna A.P.**, Di Trapani F., Marano G.C. “Optimization of steel-jacketing retrofitting of shear-critical and ductility-critical RC frame structures by a novel genetic algorithm framework”. *COMPADYN 2021 - 8th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*, streamed from Athens (Greece), June 2021.
5. Di Trapani F., **Sberna A.P.**, Marano G.C. “Expected Annual Loss oriented seismic retrofitting optimization of RC frame structures using a new AI-based framework”. *COMPADYN 2021 - 8th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*, streamed from Athens (Greece), June 2021.
6. Di Trapani F., Tomaselli G., **Sberna A.P.**, Rosso M.M., Marano G.C., Cavaleri L., Bertagnoli G. “Dynamic response of infilled frames subject to accidental column losses”. *EUROSTRUCT 2021 – 1st Conference of the European Association on Quality Control of Bridges and Structures*, Padua (Italy), September 2021.
7. **Sberna A.P.**, Di Trapani F., Marano G.C. “A novel framework based on Expected Annual Loss for optimizing seismic retrofitting in reinforced concrete structures”. *2nd fib Symposium on Concrete and Concrete Structures*, Rome (Italy), November 2021.
8. **Sberna A.P.**, Di Trapani F., Marano G.C. “A novel framework based on Expected Annual Loss for optimizing seismic retrofitting in reinforced concrete structures”. *2nd fib Symposium on Concrete and Concrete Structures*, Rome (Italy), November 2021.
9. Di Trapani F., **Sberna A.P.**, Marano G.C. “Genetic algorithm-based optimization procedure for the seismic retrofitting of existing masonry structures”. *14th International Conference on Computational Structures Technology*, Montpellier (France), August 2022.
10. Di Trapani F., **Sberna A.P.**, Demartino C., Marano G.C. “Genetic algorithm-based seismic retrofitting optimization for existing masonry structures”. *3rd European Conference on Earthquake Engineering and Seismology*, Bucharest (Romania), September 2022.
11. **Sberna A.P.**, Di Trapani F., Marano G.C. “A new genetic algorithm framework based on Expected Annual Loss for optimizing seismic retrofitting in reinforced concrete frame structures”. *19th ANIDIS Conference - Seismic Engineering in Italy*, Turin (Italy), September 2022.
12. Di Trapani F., **Sberna A.P.**, Marano G.C. “A novel genetic algorithm-based optimization framework for minimizing seismic retrofitting interventions costs in existing masonry structures”. *19th ANIDIS Conference - Seismic Engineering in Italy*, Turin (Italy), September 2022.

13. Di Trapani F., Bogatkina V., Di Benedetto M., **Sberna A.P.**, Petracca M., Camata G. "Simplified Evaluation of the Additional Shear Demand Due to Masonry Infills". *2nd Eurasian Conference on OpenSees Days, EOSD 2022* Turin (Italy), July 2022. Published in *Lecture Notes in Civil Engineering*, 2023, 326:1-132023

Presentations in conferences and workshops

- Jun 2021 COMPDYN 2021 – 8th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering, streamed from Athens (Greece), 28th - 30th June 2021
- Jul 2021 6th International course on Seismic Analysis of Structures using OpenSees (as tutor), University of Palermo (Italy), 19th - 22nd July 2021.
- Nov 2021 2nd FIB Symposium on Concrete and Concrete Structures, Rome (Italy), 18th–19th November 2021.
- Jul 2022 2nd Eurasian Conference on OpenSees, Turin (Italy), 7th – 8th July 2022.
- Aug 2022 14th International Conference on Computational Structures Technology, Montpellier (France), 23rd – 25th August 2022.
- Sep 2022 3rd European Conference on Earthquake Engineering and Seismology, Bucharest (Romania), 4th – 9th September 2022.
- Sep 2022 19th Italian Conference on Earthquake Engineering, Turin (Italy), 11th – 15th September 2022.
- Aug 2023 Engineering Mechanics Institute International Conference 2023, Palermo (Italy), 27th – 30th August 2023.
- Jan 2024 Workshop - Recent research results using OpenSees, University College London (UK), 11th January 2024.

Scientific and organizing committee of international conferences and courses

- Scientific and organizing committee of *7th international course on "Seismic analysis of Structures using OpenSees"* - Politecnico di Torino (Italy), 5th - 6th July 2022.
- Scientific and organizing committee of *"OpenSees Days Eurasia" - 2nd Eurasian Conference on OpenSees* - Turin (Italy), 7th - 8th July 2022.
- Scientific and organizing committee of *"OpenSees Days Eurasia" - 6th Eurasian Conference on OpenSees* - Beijing (China), 24th - 25th July 2024.

Teaching activities

2020 -2021 (spring) Teaching assistance, *Safety assessment and retrofitting of existing structures and infrastructures* (in english), graduate class - School of Engineering, Politecnico di Torino (Italy)

Book Chapters

- Di Trapani F., *Metodi di Analisi strutturale: Sistemi di travi e telai piani*. CLUT Editore, Torino 2022. ISBN: 9788879924894

Reviewer for International Journals

- *Advances in Structural Engineering*. ISSN: 1687-8086
- *Journal of Asian Architecture and Building Engineering*. ISSN: 1346-7581
- *Buildings*. ISSN: 2075-5309
- *Algorithms*. ISSN: 1999-4893
- *Modelling*. ISSN: 2673-3951

Turin, May 1st, 2024

Antonio P. Sberna