

# Antonio Pio Sberna

## *Curriculum vitæ*

Department of Structural, Geotechnical  
and Building Engineering  
*Politecnico di Torino*  
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📄 [antoniosberna.github.io](https://antoniosberna.github.io)

*PhD student of Civil and Environmental  
Engineering (Structural Engineering)*

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### Personal information

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

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### Education

Nov 2020 – present	<b>PhD in Civil and Environmental Engineering</b> , <i>Politecnico di Torino</i> . Research interest: <i>Optimization of seismic retrofitting interventions of non-ductile existing structures</i> . Advisors: Prof. Giuseppe Marano and Prof. Fabio Di Trapani
Oct 2017 – Jul 2020	<b>MS in Civil Engineering</b> , <i>Politecnico di Torino</i> . Master thesis (in english): <i>Optimal seismic retrofitting of reinforced concrete buildings by steel-jacketing using a genetic algorithm-based framework</i> Advisors: Prof. Fabio Di Trapani and Prof. Giuseppe Marano
Oct 2013 – Apr 2017	<b>BS in Civil Engineering</b> , <i>Università degli studi di Catania</i> . Bachelor thesis (in italian): <i>Influenza dello sforzo normale sul collasso plastico di strutture intelaiate (Effect of axial load on the plastic collapse of frame structures)</i> Advisor: Prof. Annalisa Greco

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## 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.

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## 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 – 1<sup>st</sup> Italian Workshop on Shell and Spatial Structures*, web meeting, 25<sup>th</sup> - 26<sup>th</sup> 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, 14<sup>th</sup> - 16<sup>th</sup> April 2021.
3. Di Trapani F., **Sberna A.P.**, Marano G.C. "Cost and EAL based optimization for seismic reinforcement of RC structures". *IGF26 - 26<sup>th</sup> International Conference on Fracture and Structural Integrity*, Turin (Italy), 26<sup>th</sup> - 31<sup>st</sup> 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". *COMP-DYN 2021 - 8th ECCOMAS International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*, streamed from Athens (Greece), 28<sup>th</sup>-30<sup>th</sup> 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”. *COMPDYN 2021 - 8<sup>th</sup> ECCOMAS International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering*, streamed from Athens (Greece), 28<sup>th</sup> - 30<sup>th</sup> 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 – 1<sup>st</sup> Conference of the European Association on Quality Control of Bridges and Structures*, Padua (Italy), 29<sup>th</sup> August – 1<sup>st</sup> 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”. *2<sup>nd</sup> fib Symposium on Concrete and Concrete Structures*, Rome (Italy), 18<sup>th</sup> November – 19<sup>th</sup> November 2021.

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### Speaker in congresses, conferences and courses

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| Jun 2021 | COMPDYN 2021 – 8 <sup>th</sup> International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering, streamed from Athens (Greece), 28 <sup>th</sup> - 30 <sup>th</sup> June 2021 |
| Jul 2021 | 6 <sup>th</sup> International course on Seismic Analysis of Structures using OpenSees (as tutor), University of Palermo (Italy), 19 <sup>th</sup> - 22 <sup>nd</sup> July 2021.                                  |
| Nov 2021 | 2 <sup>nd</sup> FIB Symposium on Concrete and Concrete Structures, Rome (Italy), 18 <sup>th</sup> –19 <sup>th</sup> November 2021.   |
| Jul 2022 | OpenSees Days Eurasia - 2 <sup>nd</sup> Eurasian Conference on OpenSees, Turin (Italy), 7 <sup>th</sup> – 8 <sup>th</sup> July 2022.   |
| Aug 2022 | 14 <sup>th</sup> International Conference on Computational Structures Technology, Montpellier (France), 23 <sup>rd</sup> – 25 <sup>th</sup> August 2022.   |
| Sep 2022 | 3 <sup>rd</sup> European Conference on Earthquake Engineering and Seismology, Bucharest (Romania), 4 <sup>th</sup> – 9 <sup>th</sup> September 2022.   |
| Sep 2022 | 19 <sup>th</sup> Italian Conference on Earthquake Engineering, Turin (Italy), 11 <sup>th</sup> – 15 <sup>th</sup> September 2022.  |

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### Teaching activities

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| 2020 -2021 (spring) | Teaching assistance, <i>Safety assessment and retrofitting of existing structures and infrastructures</i> (in english), graduate class - School of Engineering, Politecnico di Torino (Italy) |
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## Scientific and organizing committee of international conferences and courses

- Scientific committee of "*7<sup>th</sup> international course on Seismic analysis of Structures using OpenSees*" - Politecnico di Torino (Italy), 5<sup>th</sup> - 6<sup>th</sup> July 2022.
- Organizing committee of "*OpenSees Days Eurasia*" - *2<sup>nd</sup> Eurasian Conference on OpenSees* - Turin (Italy), 7<sup>th</sup> - 8<sup>th</sup> July 2022.

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## Book Chapters

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

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## Relevant PhD courses

- Sep 2021 **Reliability and seismic robustness of isolated structures with friction devices (FPS)**, Politecnico di Torino.  
Held by: Prof. Paolo Castaldo
- Jul 2021 **Non-linear modeling of damage and contact mechanisms applied to reinforced concrete and masonry structures**, Politecnico di Torino.  
Held by: Prof. Alessia Monaco
- Feb 2021 **Advanced techniques for optimization**, Politecnico di Torino.  
Held by: Prof. Paola Pirinoli
- Feb 2021 **Applied statistics and probability analysis**, Università degli studi di Napoli.  
Held by: Prof. Fatemeh Jalayer and Dr.Hossein Ebrahimian
- Jan 2021 **Non-linear dynamic analysis for performance-based earthquake engineering**, Università degli studi di Napoli.  
Held by: Prof. Fatemeh Jalayer and Dr.Hossein Ebrahimian
- Dec 2020 **Mimetic learning**, Politecnico di Torino.  
Held by: Prof. Giovanni Squillero