

Arch. PhD. Leone Pierangioli

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## Education

University of Florence, Italy

**PhD** in Technology of Architecture, March 2017.

Research topic: *Effects of climate change on energy performance and thermal comfort of residential buildings in the Mediterranean climate.*

Donau-Universität Krems, Austria

MSc Future Building Solution - Climate Engineering.

Attendance and final tests fulfilment of all the nine learning modules. Final thesis not completed.

University of Florence, Italy

**MSc (Laurea degree cum laude)**, Architecture; 2008

Dissertation: *EcoHouse Student Design Competition: residential housing in Florence. Energy efficiency assessment and thermal inertia control.*

## Academic and professional affiliations

Member, Laboratory of Building Physics, Department of Industrial Engineering, University of Florence;  
Member, IBPSA (International Building Performance Simulation Association) Italy chapter.

## Grants and Awards

PhD scholarship (3 years) by Italian Ministry of Education, University and Research.

IBPSA Italy Best PhD Student Paper Award at BSA 2017 (3<sup>rd</sup> IBPSA-Italy conference)

## Research and professional interests

Building performance simulation (energy, thermal, lighting);  
Energy audit and energy retrofit of existing buildings;  
Effects of climate change on energy performance and thermal comfort of buildings;  
Architectural technology and energy saving building components;  
Environmental monitoring and microclimatic control.

## Research experience

**Current position:** Postdoctoral Researcher Fellow at the Laboratory of Building Physics, Department of Industrial Engineering, University of Florence

Research program “Experimental laboratory for preliminary projects of technical and economic feasibility of UNIFI strategic building interventions – Energy Performance of Buildings”. September 2018 - ongoing

Main activities:

- Evaluation of design strategies for optimizing the energy performance of new and existing buildings by means of dynamic simulation.
- Evaluation of the energy performance of opaque and glazed building components using specific calculation tools;
- Assessment of new and existing building regarding legislative requirements for energy efficiency.

Research project “Experimental application of tools and methods for assessing the energy performance of buildings aimed at defining criteria for the awarding of energy supply services” funded by hospital AOU Careggi”. February 2018 - August 2018

Main activities:

- Energy model calibration by means of dynamic simulation and assessment of different weather conditions on building energy performance.

Research project “Experimental application of Criteri Ambientali Minimi (Ministerial Decree 11/01/2017) to the project of a new public building in Tuscany”. August 2017-October 2017

Main activities:

- Bibliographic research about Criteri Ambientali Minimi regulation;
- Assessment of building energy and lighting performance by means of dynamic simulation and other energy assessment tools

Research project “Analysis and evaluation of energy performance of a residential nZEB building. May 2017-July 2017

Main activities:

- Assessment of building energy and thermal performance by means of in-situ monitoring of building physics parameters and by means of dynamic energy simulation

Research project “LAB-ZEB – Energy refurbishment and sustainable building design to energy consumption and GHG emission reduction”. December 2013 – November 2016.

Main activities:

- In detail assessment of building energy performance by means of dynamic simulation considering IPCC AR 5 climate change scenarios effect

Research project “ASOL-Win” – Automatic SOLar Shading Systems for Windows”. March 2015 - May 2017

Main activities:

- Assessment of energy performance of shading devices by means of building physics parameters in-situ monitoring and by means of dynamic energy simulation

Research project “Environmental monitoring and microclimatic control strategies in Natural History Museum of University of Florence”. December 2013-October 2015.

Main activities:

- Environmental monitoring data analysis;
- Building energy performance analysis by means of dynamic simulation.

Research project “Evaluation of energy consumption of public buildings and development of energy retrofit strategies” (consulting agreement with Monsummano T.me municipality). February 2012 – April 2012.

Main activities:

- Monitoring and analysis of thermo-physical parameters of building components;
- Monitoring and analysis of microclimatic parameters of school and museum buildings;
- Building energy performance analysis by means of dynamic simulation.

Research project “Evaluation of energy, acoustic and lighting performance of transparent components of building envelope and solar shading devices for energy upgrading of residential buildings” (National research program PRIN 2008). July 2010-February 2012.

Main activities:

- Building energy performance analysis by means of dynamic simulation.

Research project “Performance evaluation of innovative building products and prototypes by means of building physics analysis software” (*Abitare Mediterraneo* research program supported by Regione Toscana). July 2010-June 2011.

Main activities:

- Building energy performance analysis by means of dynamic simulation;
- In-field environmental monitoring and measurements of thermal resistance.

## Publications

### *Peer-reviewed papers in international journals*

1. Carletti, C., **Pierangioli, L.**, Sciarpi, F., Salvietti, A (2018). Comparison among Detailed and Simplified Calculation Methods for Thermal and Energy Assessment of the Building Envelope and the Shadings of a New Wooden nZEB House. *Sustainability* 10(2), 476. doi:10.3390/su10020476
2. Carletti, C., Cellai, G., **Pierangioli, L.**, Sciarpi, F., and Secchi, S. (2017). The influence of daylighting in buildings with parameters nZEB: application to the case study for an office in Tuscany Mediterranean area. *Energy Procedia* 140, 339–350, doi:10.1016/j.egypro.2017.11.147.
3. Sciarpi, F., Carletti, C., Cellai, G., Muratore, V., Orsi, A., **Pierangioli, L.**, Russo, G., and Schmidt, E.D. (2017). Environmental monitoring and building simulation application to Vasari Corridor: preliminary results. *Energy Procedia* 133, 219–230, doi:10.1016/j.egypro.2017.09.393
4. **Pierangioli, L.**, Cellai, G., Ferrise, R., Trombi, G., and Bindi, M. (2017). Effectiveness of passive measures against climate change: Case studies in Central Italy. *Building. Simulation.* 1–21. doi: 10.1007/s12273-016-0346-8
5. Carletti, C., Sciarpi, F., **Pierangioli, L.**, Asdrubali, F., Pisello, A.L., Bianchi, F., Sambuco, S., Guattari, C. (2016) Thermal and lighting effects of an external venetian blind: Experimental analysis in a full-scale test room. *Building and Environment* 106, 45–56. doi: 10.1016/j.buildenv.2016.06.017
6. Secchi, S.; Sciarpi, F.; Randazzo, M.; **Pierangioli, L.** (2016) Retrofit Strategies for the Improvement of Visual Comfort and Energy Performance of Classrooms with Large Windows Exposed to East. *Energy Procedia*, 78, 3144–3149. DOI: 10.1016/j.egypro.2015.11.771.
7. Sciarpi, F.; Carletti, C.; Cellai, G.; **Pierangioli, L.** (2015) Environmental Monitoring and Microclimatic Control Strategies in “La Specola” Museum of Florence. *Energy and Buildings*, 95, 190–201. DOI: 10.1016/j.enbuild.2014.10.061.
8. Sciarpi, C., Carletti, C., Cellai, G., **Pierangioli, L.** (2014) The energy upgrading of existing buildings: Window and shading device typologies for energy efficiency refurbishment. *Sustainability*, 6, 5354–5377. doi:10.3390/su6085354.

### *Books*

1. Cellai G., Carletti C. Sciarpi F., Secchi S., Nannipieri E., **Pierangioli L.** *Serramenti e schermature per la riqualificazione energetica ed ambientale. Criteri per la valutazione e la scelta*; EPC Editore: Rome, Italy, 2013.

### *International conference papers*

1. Sciarpi, F., Carletti, C., Pierangioli, L. (2018). Energy retrofitting of school buildings: energy audit of a case study. Proceedings of 6<sup>th</sup> International Congress ReUSO, Messina, Italy, 11-13 October 2018.
2. Sciarpi, F., Carletti, C., Pierangioli, L. (2018). Assessment of thermo-hygrometric indicators for preventive conservation inside museums: in field monitoring and passive microclimatic control strategies applied to “La Specola” museum of Florence. IOP Conf. Ser.: Mater. Sci. Eng. 364. Proceedings of conference “Florence Heri-Tech - The Future of Heritage Science and Technologies”, Firenze, Italy, 16–18 May 2018.
3. C. Carletti, G. Cellai, M. Crisante, V. Muratore, A. Orsi, **L. Pierangioli**, A. Russo, G. Russo, E. D. Schmidt, F. Sciarpi (2017) Environmental monitoring and building simulation application to Vasari Corridor: preliminary results. Proceedings of Mediterranean Congress of HVAC - Climamed 2017 “Historical buildings retrofit in the Mediterranean area”. Matera, Italy, 12-13 May 2017.
4. C. Carletti, G. Cellai, **L. Pierangioli**, F. Sciarpi, S. Secchi. (2017) The influence of daylighting in buildings with parameters nZEB: application to the case study for an office in Tuscany Mediterranean area. Proceedings of 50<sup>th</sup> International Congress AICARR “Beyond NZEB buildings”. Matera, Italy, 10-11 May 2017.
5. **Pierangioli L.**, Carletti C., Cellai G., Sciarpi F. (2017) Energy refurbishment of social housing stock in Italy: analysis of some scenarios from the impact of climate change to occupant behavior. Proceedings of BSA 2017 Building Simulation Applications Third IBPSA - Italy Conference. Bolzano, Italy, 8-10 February 2017
6. **Pierangioli, L.**, Cellai, G. (2016) The Impact of Climate Change on The Energy-Efficient Refurbishment Of Social Housing Stock In Italy. Proceedings of BSO 2016 Building Simulation & Optimization Third IBPSA - England Conference. Newcastle (GB), 12-14 September 2016
7. Carletti, C., Cellai, G., **Pierangioli, L.**, Sciarpi, F. (2014) Environmental monitoring and microclimatic control strategies in “La Specola” museum of Florence, in Proceedings of 49<sup>th</sup> International Congress AICARR. Roma, Italy, 26-28 February 2014.

## Teaching experience

### Lecturer,

ABITA Master (University of Florence). 2017-2018

- Main teaching topics: Building energy performance analysis by dynamic energy simulation tools.

Continuing education courses and professional seminars for Energy Assessors and Architects. 2009-2016.

- Main teaching topics: Building energy performance assessment: Simple calculation tools and dynamic simulation tools; Energy certification of building.

## Professional experience

### Freelance Building Performance Simulation Consultant, from 2008 ongoing

Main activities:

- Energy audit and energy performance assessment by means of dynamic simulation tools (residential buildings, school buildings and industrial buildings);
- Energy performance certification (various project);
- Thermal comfort analysis by means of dynamic simulation tools (residential buildings);
- Daylight performance analysis (school buildings);
- IR thermography (residential buildings);
- FEM analysis of thermal performance of building components (directional buildings);
- Measurements of Thermo-Hygrometric parameters (residential buildings);
- Measurements of thermal resistance of opaque building components (directional buildings).

### IPJ Ingenieurbüro P. Jung GmbH - Germany, Internship. September 2012-February 2103

- Building performance analysis by means of dynamic building simulation

### Forma Project Consulting (facility management service company) – Italy. 2006-2013

- HVAC systems survey (public hospitals and office buildings)

## Software skills

**CAD:** Autodesk Autocad

**Building performance simulation:** Design Builder; Energy Plus

**Daylight analysis:** Relux; Daysim

**Finite Element Analysis:** Physibel Bisco, Bistra, Trisco; LBNL Therm

**MS Office:** Word 2016; Excel 2016 6; PowerPoint 2016

## Language skills

Italian: native;

English: elementary/intermediate (European level A2/B1);

## General information

Born in Montalcino (Siena), Italy, on 27 August 1977.