Riccardo Talami

PhD researcher in Building Performance Optimization at Loughborough University (UK).

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Principal Field of Interests

Sustainable Building Design; Building Performance Optimization; Performance-based Building Design, Building Performance Simulation and Uncertainty Analysis; Computational Design, Evolutionary Computation; Early-design Exploration and Informed Decision Making; Smart Buildings; HVAC Systems; Thermal Comfort; Daylighting; Indoor Environmental Quality.

Education

• Doctor of Philosophy (PhD) in Building Science (Building Performance Optimization) January 2019 - February 2022 (expected)
School of Architecture, Building and Civil Engineering
Loughborough University (Loughborough, United Kingdom)

Thesis:
The sequential whole-building design optimization approach for building performance.

Supervisors: Prof. Jonathan Wright and Dr. Bianca Howard.

• Master of Science in Architecture and Innovation (Sustainable Design) October 2014 - March 2017
University IUAV of Venice (Venice, Italy)

Thesis
Recent trends in radiant system technology for heating and cooling: analysis of the factors that influence the built environment - United States and Italy.

Collaboration between the Center for the Built Environment (CBE), University of California Berkeley, (United States), STEAM Engineering and Architecture firm, Padova, (Italy) and University IUAV of Venice.

Supervisors: Fred Bauman, PE (UC Berkeley), Prof. Piercarlo Romagnoni (IUAV)and Simone Cappelletti (STEAM Engineering).

• Bachelor of Science in Architecture October 2011 - September 2014
University IUAV of Venice (Venice, Italy)

Academic experience

• Doctoral Researcher January 2019 - February 2022 (expected)
School of Architecture, Building and Civil Engineering
Loughborough University (Loughborough, United Kingdom)

• Co-Instructor and Teaching Assistant September 2017 - December 2018
ASD - Architecture and Sustainable Design Pillar
Singapore University of Technology and Design - SUTD - (Singapore)

• Research Assistant March 2017 - December 2018
Design for Climate and Comfort Lab (DCC)
Singapore University of Technology and Design - SUTD - (Singapore)

• Visiting Student Researcher May 2016 - November 2016
Center for the Built Environment (CBE)
University of California Berkeley - (United States)

Research projects

• The sequential whole-building design approach for bulding performance — January 2019 - February 2022 (expected)
Loughborough University (United Kingdom)

The research develops a novel whole-building design approach in the multi-objective optimization of building geometry, fabric, HVAC systems and controls to support the high-performance building design process. It then evaluates its effectiveness, reliability, and computational efficiency.

Supervisors: Prof. Jonathan Wright, Dr. Bianca Howard.

• Comparing laboratory and field studies of occupant lighting experience — July 2018 - In progress
Singapore University of Technology and Design - SUTD - (Singapore)

The research investigates if laboratory conclusions related to visual discomfort and lighting quality are applicable to real building conditions. This is achieved by comparing 40 laboratory post-occupancy evaluation responses to 40 field responses in actual office workspaces in Singapore.

Supervisor: Dr. J. Alstan Jakubiec.

• Subjective and measured evidence for residential lighting metrics in the tropics — July 2018 - December 2018
Singapore University of Technology and Design - SUTD - (Singapore)

The research presents a comprehensive study methodology to craft statistically-valid subjective models based on predictive lighting simulation data. This is done by comparing measured and simulated lighting levels in 17 residential housing units in Singapore against the subjective opinions of 35 participants who reside in the units.

Supervisor: Dr. J. Alstan Jakubiec.

• Radiant Cooling Systems in the Tropics — March 2017 - December 2018
Singapore University of Technology and Design - SUTD - (Singapore)

The research aims to support early-design decisions when integrating radiant cooling systems in architectural design. This is achieved by identifying the most important and influential passive and active design parameters related to energy consumption, system operation and thermal comfort in the tropics. Through this research, meaningful guidelines were created to focus a proportionate amount of design effort on variables with a larger impact on building performance, and establishing an order of importance on which the design parameters should be addressed during the design process.

Supervisor: Dr. J. Alstan Jakubiec

• Sustainable Futures: Cooling — March 2017 - December 2018
Singapore University of Technology and Design - SUTD - (Singapore)

In a collaboration with the Lee Kuan Yew Centre for Innovative Cities, the cooling portion of the project investigates human behaviours by performing long term observational field studies in commercial and residential spaces, and analyzing how individuals operate their spaces in buildings through statistical analysis of air-conditioning, window shading, and electric lighting use. Translating these observations into predictive models, the results will be used to inform building design decisions.

Supervisor: Dr. J. Alstan Jakubiec

• Optimizing Radiant Systems for Energy Efficiency and Comfort — May 2016 - November 2016
UC Berkeley - Center for the Built Environment (CBE) (United States)

The objective of this project was to contribute to improved understanding of applications, design and optimization of radiant heating and cooling systems, and to develop guidelines, tools and resources for system designers and operators. The project contributed to the implementation of a database of over 400 commercial buildings that use radiant cooling and heating across the globe, the largest database of its kind to date. All buildings from the database are displayed on an online interactive map (http://bit.ly/RadiantBuildingsCBEv2).

Supervisor: Fred Bauman, PE.

Teaching

• Center for the Energy Resilience and the Built Environment (ERBE): May 2021 - May2021
Loughborough University (United Kingdom)
Role: Invited lecturer.

• Center for the Energy Resilience and the Built Environment (ERBE): May 2020 - May2020
Loughborough University (United Kingdom)
Role: Invited lecturer.

• 20.112 Sustainable Design Option Studio 2: May 2018 - December 2018
Singapore University of Technology and Design - SUTD - (Singapore)
Role: Teaching Assistant.

• 20.112 Sustainable Design Option Studio 3: January 2018 - April 2018
Singapore University of Technology and Design - SUTD - (Singapore)
Role: Teaching Assistant.

• 20.111 - 20.501 Sustainable Design Option Studio 1: January 2018 - April 2018
Singapore University of Technology and Design - SUTD - (Singapore)
Role: Teaching Assistant.

• 20.223 History, Theory and Culture 3: September 2017 - December 2017
Contemporary Architecture Between Technology, Science and Culture.
Singapore University of Technology and Design - SUTD - (Singapore)
Role: Co-Instructor.

External academic experience

• Reviewer for Building Simulation 2019: 16th Conference of IBPSA August 2018 - September 2019
2-4 September 2019, Rome (Italy).

• Reviewer for Building Simulation and Optimization 2020 September 2019 - September 2020
21-22 September 2020, Loughborough (UK), on-line.

• Reviewer for Building Simulation 2021: 17th Conference of IBPSA August 2020 - September2021
1-3 September 2021, Bruges (Belgium), in-person and on-line.

Architectural experience

• Architectural internship September 2013 - February 2014
Arch. Renzo Parise (Padova, Italy).

Skills summary

• Languages

- English: Full Professional proficiency.
- Italian: Native proficiency.
- French: Elementary proficiency.
- Spanish: Elementary proficiency.

• Technical

Energy Analysis: Energy Plus (Conventional, Design Builder and Open Studio interfaces), ArchSim and Honeybee plug-ins for Grasshopper.
Energy Certification: Master Clima 11300.
Solar and Environmental Analysis: Ecotect, Climate Consultant.
Daylight Analysis: Radiance (DIVA and Ladybug interfaces).
Parametric Modeling: Rhinoceros/Grasshopper.
Statistics and Data Science: R.
Programming: Python, Java.
Environmental sensors: HOBO products.
Architecture/Engineering drafting and modeling: AutoCAD, ArchiCAD, Revit, SketchUp, Rhinoceros.
Graphic and editing: Photoshop, Illustrator, InDesign.

Publications

Talami, Riccardo, Wright, Jonathan and Howard, Bianca. 2021. Multi-criteria robustness assessment of a sequential whole-building design optimization. Building Simulation, Bruges, Belgium, September 1-3.

Talami, Riccardo, Wright, Jonathan and Howard, Bianca. 2020. A comparison between sequential and simultaneous whole-building design optimization for building performance. Building Simulation, and Optimization Loughborough, UK, September 21-22.

Talami, Riccardo, and J. Alstan Jakubiec. 2020. Early-design sensitivity of radiant cooled office buildings in the tropics for building performance. Energy and Buildings, 223, 110177.

Talami, Riccardo, and J. Alstan Jakubiec. 2019. Sensitivity of design parameters on energy, system and comfort performance for radiant cooled office buildings in the tropics. Building Simulation, Rome, Italy, September 2-4.

Jakubiec, J. A, Srisamranrungruang, T., Kong, Z., Quek, G.and Riccardo Talami. 2019. Subjective and measured evidence for residential lighting metrics in the tropics. Building Simulation, Rome, Italy, September 2-4.

Talami, R., C. Karmann, F. Bauman, S. Schiavon, and P. Raftery. 2017. Recent trends in radiant system technology in North America. CBE Research Report. April.

Talami, Riccardo, Wright, Jonathan and Howard, Bianca. 2022. A novel whole-building design optimization approach for building performance (in progress).

Talami, Riccardo, Wright, Jonathan and Howard, Bianca. 2022. A comparison of deterministic and probabilistic optimization agorithms for the building design process (in progress).

Talami, Riccardo, Wright, Jonathan and Howard, Bianca. 2022. Robustness assessment of a novel whole-building design optimization approach for building performance (in progress).

Jakubiec, J. A, Kent, M., Kong, Z., and Riccardo Talami. 2022. Comparing Laboratory and Field Studies of Occupant Lighting Experience – A Controlled Case Study. (Abstract accepted for Building Performance Analysis conference.)

References

• Prof Jonathan Wright, Full Professor. School of Architecture, Building anc Civil Engineering. Loughborough University
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• Dr. Bianca Howard. Senior Lecturer. School of Architecture, Building anc Civil Engineering. Loughborough University
e-mail: b.howard@lboro.ac.uk, telephone: +441509228745.

• J. Alstan Jakubiec, Assistant Professor. Daniels Faculty of Architecture, Landscape and Design/ The School of the Environment
e-mail: alstan.jakubiec@daniels.utoronto.ca, telephone: +1 416-666 0951.