

Sara Torabi Moghadam

Postdoctoral Researcher

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PROFILE SUMMARY

Sara Torabi Moghadam (female, architect). Ph.D. in "Urban and Regional Development" in 2018 and Master's degree in Sustainable Architecture in 2014, at the Politecnico di Torino.

She is a Postdoctoral Researcher at the "Urban Sustainability & Security Laboratory for Social Challenges - S3+Lab" in Interuniversity Department of Regional & Urban Studies and Planning – DIST, Politecnico di Torino with a demonstrated history of 6 years in the field of "Sustainable Cities" and "Smart Cities" being involved in a number of national and European projects, such as EEB-Zero Energy Buildings in Smart Urban Districts (Cluster), DIMMER - District Information Modelling and Management for Energy Reduction (Seventh Framework Programme (FP7)), CESBA MED for Sustainable MED Cities (Interreg MED), PLATIP – Planeamento Territorial Integrado Participativo (European Regional Development Fund). Moreover, she is a member of the working group of the Politecnico di Torino in support of the Piedmont area in the MOLOC - Low carbon urban morphology (Interreg Europe), and SCORE - Supporting Consumer Co-Ownership in Renewable Energies (H2020) projects, aimed respectively at the definition of a set of indicators for urban sustainable developments strategies in the City of Turin and the definition of a new co-ownership model towards energy transition in Susa Valley. She also carried out a research period at LESO-PB Laboratory, École Polytechnique Fédérale de Lausanne - EPFL.

In her career, she has worked with both public administration and the private sector entities aiding them in achieving sustainable development goals. Her main research fields concern sustainable urban planning, key performance indicators (KPIs) impact assessment, and evaluation. Her expertise focuses on Multi-Criteria Spatial Decision Support System (MC-SDSS), which intends to facilitate the participatory decisional process for stakeholders who can ask "what-if" questions and visualize "if-then" scenarios in a real-time. She has organized different focus groups and workshops involving real stakeholders in planning decisional processes.

In addition, she is the author of numerous international publications and she has participated as a speaker in several international conferences and seminars.

EDUCATION

Polytechnic University of Turin (Polito), Turin, Italy **Nov 2014 - Apr 2018**

- Ph.D. in Urban and Regional Development, Interuniversity Department of Regional & Urban Studies and Planning (DIST)

Ph.D. Research Topic: A new integrated Multi-Criteria Spatial Decision Support System (MC-SDSS) for urban energy planning in the built environment, **Score: Excellent, cum laude and best Ph.D. Award 2018 "premio di qualità"**.

École Polytechnique Fédérale De Lausanne (EPFL), Lausanne, Switzerland **Feb 2017 - Jul 2017**

- Ph.D. Visiting Scholar, Solar Energy and Building Physics Laboratory (LESO-PB), School of Architecture, Civil and Environmental Engineering (ENAC)

Polytechnic University of Turin (Polito), Turin, Italy **Oct 2011 - Jul 2014**

- M.Sc. in Sustainable Architecture

Thesis title: Computational Assessment of the Impact of Occupant-Related Assumptions on the Thermal Performance of an Office Building, **GPA: 110/110 cum laude**

Vienna University of Technology (TU WIEN), Vienna, Austria **Oct 2013 - Mar 2014**

- Master's Thesis Abroad, Department of Building Physics and Building Ecology

Polytechnic University of Turin (Polito), Turin, Italy **Oct 2008 - Sep 2011**

- B.Sc. in Architecture

Thesis title: The Proximity Project, New devices of cohabitation and housing strategies, GPA: 108/110

Imam Khomeini International University (IKIU), Qazvin, Iran **Jan 2003 – Mar 2008**

- B.Sc. in Applied Physics

RESEARCH AND TEACHING INTERESTS

- Sustainable assessment and evaluation
- Smart Cities and Sustainable Urban Development and Planning
- KPIs Impact Assessment and Evaluation
- Urban Energy Planning
- Multi-Criteria Spatial Decision Support System
- Participatory Approaches
- Economic evaluation

SCIENTIFIC PUBLICATIONS

- **Journal**

- S. Torabi Moghadam, M.V. Di Nicoli, S. Manzo, P. Lombardi. (2020). Mainstreaming Energy Communities in the Transition to a Low-Carbon Future: A Methodological Approach. *Energies*. vol. 13, 1597, pp. 1-25. doi: <http://dx.doi.org/10.3390/en13071597>
- S. Torabi Moghadam; P. Lombardi. (2019). An interactive multi-criteria spatial decision support system for energy retrofitting of building stocks using CommunitiVIZ to support urban energy planning. *Building and Environment*. ISSN 0360-1323. vol. 163, pp. 1-25. doi: 10.1016/j.buildenv.2019.106233
- S. Torabi Moghadam; S. Coccolo; G. Mutan; P. Lombardi; J.L. Scartezzini; D. Mauree. (2019). A new clustering and visualization method to evaluate urban heat energy planning scenarios. *Cities*, ISSN 0264-2751, vol. 88, pp. 19-36. doi: 10.1016/j.cities.2018.12.007.
- S. Torabi Moghadam, J. Toniolo, G. Mutani, P. Lombardi. (2018). A GIS statistical approach for assessing built environment energy use at urban scale. *Journal of Sustainable Cities and Society*, vol. 37, pp. 70-84. doi: 10.1016/j.scs.2017.10.002.
- D. Dirutigliano; C. Delmastro; S. Torabi Moghadam. (2018). A multi-criteria application to select energy retrofit measures at the building and district scale. *Thermal science and engineering progress*. ISSN 2451-9049. vol. 6, pp. 457-464. doi: 10.1016/j.tsep.2018.04.007.
- S. Torabi Moghadam, C. Delmastro, S.P. Corgnati, P. Lombardi. (2017). Urban energy planning procedure for sustainable development in the built environment: a review of available spatial approaches. *Journal of cleaner production*, vol. 165, pp. 811-827. doi: 10.1016/j.jclepro.2017.07.142.
- S. Torabi Moghadam, G. Mutani, P. Lombardi. (2017). A mixed methodology for defining a new spatial decision analysis towards low carbon cities. *Procedia Engineering*, vol. 198, pp. 375–385. doi: 10.1016/j.proeng.2017.07.093.
- D. Dirutigliano, C. Delmastro, S. Torabi Moghadam. (2017). Energy efficient urban districts: A multi-criteria application for selecting retrofit actions. *International Journal of Heat and Technology*, vol. 35, Special Issue 1, September 2017, pp. 549-557. ISSN: 0392-8764. doi: 10.18280/ijht.35Sp0107.B 2.
- P. Lombardi, F. Abastante, S. Torabi Moghadam, J. Toniolo. (2017). Multicriteria Spatial Decision Support Systems for Future Urban Energy Retrofitting Scenarios. *Sustainability*, vol. 9, n. 7. pp. 1-13. ISSN 2071. doi: 1050, 10.3390/su9071252.
- S. Torabi Moghadam, C. Delmastro; P. Lombardi; S.P. Corgnati. (2016). Towards a New Integrated Spatial Decision Support System in Urban Context. *Procedia Social & Behavioural Sciences*, vol. 223, pp. 974-981. ISSN 1877-0428. doi: 10.1016/j.sbspro.2016.05.334.
- S. Torabi Moghadam, C. Delmastro; P. Lombardi; S.P. Corgnati., J. Toniolo. (2017). Verso nuovi modelli di supporto alle decisioni contesto urbano, *LaborEst*, n. 13, pp. 60-65. ISSN 2421-3187.
- S. Torabi Moghadam, F. Soncini; V. Fabi, S.P. Corgnati. (2015). Simulating Window Behaviour of Passive and Active Users. *Energy Procedia*. ISSN 1876-6102. vol. 78, pp. 621-626. doi: 10.1016/j.egypro.2015.11.040

- **Book chapter**

- F. Abastante; P. Lombardi; S. Torabi Moghadam. (2019). How to define energy criteria in the absence of open data: a stakeholders-oriented approach based on Multi Criteria Analysis (MCA). *Spatial Planning in the Big Data revolution*, IGI Global, pp. 139-160.
- S. Torabi Moghadam, P. Lombardi, F.M. Ugliotti, A. Osello, G. Mutani. (2016). BIM-GIS Modelling for Sustainable Urban Development. *NEWDIST*, vol. Special Issue n. July 2, pp. 339- 50. ISSN 2283-8791. 5
- S. Torabi Moghadam; P. Lombardi. (2019). Multi-criteria Spatial Decision Support System for Urban Energy Planning: An Interdisciplinary Integrated Methodological Approach. *Sustainable Cities - Authenticity, Ambition and Dream*. IntechOpen. pp. 79-93. ISBN: 978-1-78985-524-1
- S. Torabi Moghadam, P. Lombardi, J. Toniolo. (2017). Towards the establishment of a District Information Modelling. *Advances in Construction ICT and e-Business*, Routledge, London and New York, pp. 245-262. ISBN 978- 1138914582.
- S. Torabi Moghadam, G. Mutani, P. Lombardi. (2016). GIS-Based Energy Consumption Model at the Urban Scale for the Building Stock. *JRC Conference and Workshop Report*, Paolo Bertoldi. European Union, Luxembourg, pp. 56-63. ISBN 978-92-79-59779-4.

- **Proceeding and seminars**

- S. Torabi Moghadam; M.V. Di Nicoli; S. Manzo; P. Lombardi. (2019) Supporting Consumer Co-Ownership in Renewable Energies: SCORE H2020 project. SBE 19 Malta, 21-22 November 2019.
- S. Torabi Moghadam; M.V. Di Nicoli; A. Giacomini; Lombardi, Patrizia; J. Toniolo (2019). The role of prosumers in supporting renewable energies sources. pp. 1-8. *SBE 19, Emerging Concepts for Sustainable Built Environment*, Helsinki, Finland 22–24 May 2019.
- C. Genta; P. Lombardi; V. Mari; S. Torabi Moghadam. (2019). Key Performance Indicators for Sustainable Urban Development: Case Study Approach. IOP Conference Series. Earth and Environmental Science. - ISSN 1755-1315. Vol. 296. *SBE19 - Resilient Built Environment for Sustainable Mediterranean Countries*, Milan, Italy, 4-5 September 2019.
- M.V. Di Nicoli; P. Lombardi; S. Torabi Moghadam. (2018). Transnational Key Performance Indicators (KPIs) for Sustainable Development. Urban promo green conference, Venice, Italy, September 20th -21th 2018.
- S. Torabi Moghadam; P. Lombardi. (2018). An Integrated Multi-Criteria Spatial Decision Support System for Urban Energy Scenarios- *Euro2018 – 29th European conference on operational research*, Valencia, Spain, July 8-11 2018.
- S. Torabi Moghadam, P. Lombardi, J. Toniolo, F. Abastante, I. Lami (2017). Map-based Multicriteria Analysis to Support Stakeholder-oriented Urban Energy Scenarios, *21st Conference of the International Federation of Operational Research Societies*, Quebec City, Canada, July 17 -2 2017.

- S. Torabi Moghadam, G. Mutani, P. Lombardi. (2016). A spatial energy consumption assessment for building stock supporting low carbon scenarios development, *Energy Systems Conference 2016: 21st Century Challenges*, QEI Centre, Westminster, London, UK, June 14 -15 2016.
- S. Torabi Moghadam, F. Soncini, S.P. Corngati, V. Fabi. (2015). Appraising the effects of window opening behaviour in an office building in different climates. *2nd IBPSA-Italy conference* Bozen-Bolzano, Bozen-Bolzano, February 4–6 2015, pp. 51-57
- S. Torabi Moghadam, F. Soncini, S.P. Corngati, V. Fabi, F. Tahmasebi, A. Mahdavi. (2014). The Impact of Window Operation Assumptions on the Thermal Simulation Results of an Office Building, *Proceedings of the 2nd ICAUD International Conference in Architecture and Urban Design* Epoka University, Tirana, Albania, 8-10 2014, pp. 198-1-198-8.

RESEARCH PROJECTS

Editorial Board

Journal of Environmental Treatment Techniques (JETT) (ISSN 2309-1185)

May 2020 - Present

Guest Editor

The journal Sustainability (ISSN 2071-1050, IF 2.59)

Mar 2020 - Present

Member of scientific committee

The journal of "Il Piemonte delle Autonomie" (ISSN 2385-085X)

Sep 2018 - Present

Researcher

Nov 2014 - Present

Polytechnic University of Turin (Polito), Turin, Italy

Involved projects:

- **Supporting Consumer Co-Ownership in Renewable Energies (SCORE) | funded by European commission H2020 | Apr 2018-Present**
- Project manager and teamwork coordinator, including participation in European project meetings;
- Collection and preliminary study of scientific literature and the most updated theory on the topic;
- Preliminary screening of case studies and selection of ten pilots case studies representative in the Italian context, Susa Valley;
- Research and analysis of the constraints present in the pilot case studies municipal area;
- Contributing to Performance Evaluation using Program and Project Management Tools and Techniques (Project Scheduling, Variance Analysis, Risk Analysis, Earned Value Management);
- Definition of Key Performance Indicators (KPIs) to perform feasibility analysis and monitor the sustainable alternatives;
- Estimate costs related to the energy requalification of buildings at the district level;
- Organization and management of interactive workshops in order to involve stakeholders including public administrations, private entities and citizens.
- **Low Carbon Urban Morphologies (MOLOC) | Interreg Europe, funded by Municipality of Turin | Sep 2018-Dec 2019**
- Project manager and teamwork coordinator, including participation in European project meetings and defining Work Packages;
- Direct communication with the Municipality of Turin with regard to local stakeholders' analysis;
- Organization of workshops for both public administration and the private to provide low-carbon strategies regarding the new Master Plan of Turin;
- Identification and analysis existing obstacles for the city of Turin through participative approaches and workshop;
- Critical reading and revision of the energy and urban planning regulations currently in force in the Piedmont region;
- A diagnosis of the current level of sustainability on an urban scale with verification and mapping of key indicators (KPI) using Geographic information System (GIS) and Multi Criteria Analysis (MCA) methods;
- Co-author and reviewer of project reports.
- **CesbaMED, Interreg MED | funded by Municipality of Turin | Sep 2018-Oct 2019**
- Project manager and teamwork coordinator, including participation in European project meetings;
- Direct communication with the Municipality of Turin as an external expert with regard to promoting a neighborhood level approach to develop synergies in energy efficiency;
- Definition of the methodological framework;
- Development of a based on the analysis conducted, compiled according to the guidelines of the Interreg project manual.
- Author of project Deliverables.
- **Planeamento Territorial Integrado Participativo (PLATIP) | funded by AVSI Foundation | Jun 2017-Dec 2019**
- Project manager;
- Monitoring and Evaluate the methodological framework of the project through interviews and in situ visiting;
- Systematize the actions carried out by reviewing the methodology to replicate the action and the adoption of the PLATIP methodology and tools in other medium-sized cities in Mozambique context;
- Produce project reports.
- **Big/Open Data & Spatial Analytics | funded by the DIST department | Feb 2018-Present**
- Explorative phase;
- GIS database creation and spatial data collection to provide a data hub for the Municipality of Chiomonte, Italy.
- **Zero Energy Buildings in Smart Urban Districts (EEB) | funded by the Ministry of Education, University and Research (MIUR) | Nov 2014-Dec 2017**
- Literature review regarding different phases of urban energy planning, which consist of (a) the spatial modelling approaches that can be applied to the energy use of building stock (b) Multi Criteria Decision Support System (MC-SDSS) tools for energy planning;
- Creation of a supportive GIS database including large amount of data and information regarding the building stock that helps to identify and locate hot-spot areas;

- Develop a new MC-SDSS integrated into the GIS considering the socio-economic, technical and environmental aspects;
- Exploring and testing an interactive energy visualization tool forming different workshops with real stakeholders from the municipality of Settimo Torinese and using questionnaires and structured discussions.
- **Total Energy Use in Buildings: Analysis & Evaluation Methods (EBC Annex 53) | Oct 2012-Jul 2013**
- Uncertainty analysis of the impact of occupant behavior on energy consumption in an office building with a dynamic modeling tool (IDA ICE) simulating the real window behavioral model;
- Evaluation of the influence of window behavior in different climates;
- Development of individual behavioral models as an “Active” and “Passive” user;
- Investigation of various techniques for evaluating building envelopes;
- Evaluation of natural ventilation and the passive cooling control system in the office building.
- **Involved also in European research projects such as:**
- **DIMMER - District Information Modeling and Management for Energy Reduction.** FP7 funded;
- **Shape Energy** - Horizon 2020 funded.

Teaching Experiences

Oct 2015 - present

- Decision Making for Sustainable Development Goals with professor Patrizia Lombardi (Autumn 2018/19/20)
- Design Unit course with professor Patrizia Lombardi (Spring 2018, Spring 2019)
- Design Unit course with professor Patrizia Lombardi (Winter 2015)
- Urban planning course with prof. Riccardo Bedrone, Polytechnic University of Turin, (Spring 2013)

Consultant

Jun 2018 - Sep 2019

Planet Smart City S.r.l., Turin, Italy

- Project manager and teamwork coordinator, including participation in project meetings and defining work packages;
- Preparing a technical proposal for developing an interactive Spatial decision-making tool for Smart Cities real state;
- Selection of KPIs to evaluate the impact of Planet Idea smart solutions through different scenarios;
- Support to develop a new innovative MC-SDSS in the GIS environment considering the socio-economic, technical and environmental aspects: a participatory and collaborative visualization platform to be able to define and analyze the different scenarios of smart scale solutions urban;
- Support to transfer the developed tool to an interactive Web-GIS visualization tool;
- Co-editing of the final report.

Engineering Intern

Oct 2015 - Mar 2016

Telecom Italy, Turin, Italy

- Analyzing real-time data monitoring for electric energy consumption;
- Analyzing the influence of occupant behavior on energy usage.

AWARDS AND HONORS

- Best Ph.D. Award 2018 “*premio di qualità*”, Polytechnic University of Turin, Italy, (Dec 2018)
- Ph.D. in Urban and Regional Development with Honor, Polytechnic University of Turin, (Apr 2018)
- Graduated in Master of science in Sustainable Architecture with Honor, Polytechnic University of Turin, (Jul 2014)
- Award of the degree in B.Sc. from Edisu Piedmont, (2011)
- Ranked in 5% top students among B.Sc. students in Physics, Imam Khomeini International University (IKIU), (2008)

CERTIFICATES

- Membership in Italian Society of Evaluation and Evaluation (SIEV), (Jan 2020)
- Autodesk Building Performance Analysis (BPA), (Aug 2014)
- Membership in Regional Studies Association (RSA), (May 2016)
- IABP PhD Summer School “Building Physics in Urban Environment, Politecnico di Torino, (Jun 2015)
- Membership in American Society of Heating, Refrigerating & Air Conditioning Engineers (ASHRAE), (Jan 2013)
- Membership in International Building Performance Simulation Association (IBPSA), (Sep 2013)
- Workshop “Digital representation for the project and communication”, Italy, Turin (Spring 2012)
- Cross Cultural Travel Behavior, (Aug 2014)

LANGUAGES

- Persian (Native or bilingual proficiency)
- Italian (Professional working proficiency)
- English (Professional working proficiency)
- Arabic (some competencies)
- French (some competencies)

TECHNICAL SKILLS

- GIS, CommunityViz, AutoCAD (Expert)
- Microsoft Office, Gantt Charts (Expert)
- Data Rapid Miner, SPSS data mining software (Expert)
- Decision Making software (Expert)

- Ecotect, IDA ICE, Dialux, Leto, SolverSerre, Bestclass, Wind chill, Involucro, Echo 4 (Expert)
- Adobe Photoshop, 3D MAX, V-ray, InDesign (Expert)

- Revit, Rhino, Grasshopper, EnergyPlus, CitySim, Rstudio, Illustrator, Tableau (Familiar)

REFERENCES

- Available upon request