S. AMIR TABADKANI

Architect and Computational Designer
Sustainability Consultant
Energy & (Day)lighting Optimization Expert

Current position:

PhD Candidate and Research Assistant, School of Architecture and Built Environment, Deakin University, Geelong Waterfront Campus, Australia

✉ stabadkani@deakin.edu.au

in https://www.linkedin.com/in/amirtabadkani

📞 (+61) 434717234

iD https://orcid.org/0000-0002-5466-1045

Core Skills

Reference (🔘 https://issuu.com/amirtabadkani/docs/esd-portfolio):

- 3D rendering and real-time animations
- Climatic Form-finding
- Energy modeling and simulation
- (Day)light modeling and strategies
- Thermal/Visual comfort assessment
- Façade design and detailing
- Thermal bridging modeling and evaluation
- Computational design
- Performance prediction of adaptive facades
- Developing advanced and responsive control systems

Education

Deakin University, Australia   [2018 – 2021]

PhD Candidate in Architecture & Built Environment

Dissertation: Towards a simulation-based operation of non-conventional adaptive facades – A Personalized Real-time Control (PRC)

Polytechnic University of Milan (POLIMI), Italy   [2012 - 2015]

M.Sc. in Architectural Engineering - Total GPA: 108/110
Thesis: Innovative Bio-climatic European School Complex in Crete, Greece
http://hdl.handle.net/10589/112912

Azad University of Mashhad, Iran   [2007 - 2011]

B.Sc. in Architectural Engineering - Total GPA: 17.35/20

Academic Honors

HDR Scholarship Winner for Doctoral Studies at Deakin University (DUPRS)   **2018**
|Issuer: Deakin University|

Silver Scholarship Winner for Master Studies at Milan Polytechnic University   **2012**
|Issuer: Milan Polytechnic University|

Internship

A collaboration between Ball State University of USA and Polytechnic University of Milan, Italy towards preserving MONDONICO in a 7 days' workshop (80 hours) as a qualified student   **2014**

Responsibilities: Masterplan design and drawing technical details, and Envelope thermal analysis

Publications

Journal Papers

Tabadkani, A., Roetzel, A., Hong Xian, L., Tsangrassoulis, A. (2021). Daylight in buildings and visual comfort evaluation: The advantages and limitations. *Journal of Daylighting*, 8, pp. 181-203, https://doi.org/10.15627/jd.2021.16

Tabadkani, A., Roetzel, A., Hong Xian, L., Tsangrassoulis, A., Attia, S. (2021). Analysis of the impact of automatic shading control scenarios on occupant's comfort and energy load. *Applied Energy*, 294, pp. 116904, https://doi.org/10.1016/j.apenergy.2021.116904

Hajirasouli, A., Banihashemi, S., Kumarasuriyar, A., Talebi, S., **Tabadkani, A.** (2021). Virtual reality-based digitization for endangered heritage sites: Theoretical Framework and Application. *Journal of Cultural Heritage*, 49, pp. 140-151, https://doi.org/10.1016/j.culher.2021.02.005

Tabadkani, A., Roetzel, A., Hong Xian, L., Tsangrassoulis, A. (2021). Design approaches and typologies of adaptive facades: A review. *Automation in Construction*, 121, pp. 103450, https://doi.org/10.1016/j.autcon.2020.103450

Tabadkani, A., Roetzel, A., Hong Xian, L., Tsangrassoulis, A. (2021). A review of occupant-centric control strategies for adaptive facades. *Automation in Construction,* 122, pp. 103464, https://doi.org/10.1016/j.autcon.2020.103464

Tabadkani, A., Roetzel, A., Hong Xian, L., Tsangrassoulis, A. (2020). A review of automatic control strategies based on simulations for adaptive facades. *Building and Environment*, 175, pp. 106801, https://doi.org/10.1016/j.buildenv.2020.106801

Tabadkani, A., Tsangrassoulis, A., Roetzel, A., Hong Xian, L. (2020). Innovative control approaches to assess energy implications of adaptive facades based on simulation using EnergyPlus. *Solar Energy*, 206, pp. 256-268, https://doi.org/10.1016/j.solener.2020.05.087

Soflaei, F., Shokouhian, M., **Tabadkani, A.**, Moslehi, H., Berardi, U. (2020). A simulation-based model for courtyard housing design based on adaptive thermal comfort. *Journal of Building Engineering*, 101335, https://doi.org/10.1016/j.jobe.2020.101335.

Tabadkani, A., Valinejad Shoubi, M., Soflaei, F., & Banihashemi, S. (2019). Integrated parametric design of adaptive facades for user's visual comfort. *Automation in Construction*, 106, 102857. https://doi.org/10.1016/j.autcon.2019.102857

Tabadkani, A., Banihashemi, S., & Hosseini, M. R. (2018). Daylighting and visual comfort of oriental sun responsive skins: A parametric analysis. *Building simulation* (Vol. 11, No. 4, pp. 663-676). Tsinghua University Press.

Banihashemi, S., **Tabadkani, A.**, & Hosseini, M. R. (2018). Integration of parametric design into modular coordination: A construction waste reduction workflow. *Automation in Construction*, *88*, 1-12.

Conference Papers

Hosseini, M.R., Banihashemi, S., Martek, I., **Tabadkani, A.**, Shrestha, A. (2017). Sustainable construction project management critical success factors for developing countries, *in CRIOCM 2017: Proceedings of 22nd International Conference on Advancement of Construction Management and Real Estate*, [Melbourne, Vic.], pp. 77-84

Banihashemi, S., **Tabadkani, A.**, & Hosseini, M. R. (2017). Modular coordination-based generative algorithm to optimize construction waste. *Procedia engineering.*

Tabadkani, A. (2016). Bio-climatic principles in cold semi-arid region: The case of Iran, 2nd International Conference and 3rd National Conference on New Technologies Application in Engineering

Activities

Active Participant | International Energy Agency's Energy in Buildings and Communities (IEA EBC) – Annex 79 (https://iea-annex.org/)   **[2019 - Now]**

Reviewer | Publishers: Elsevier, Solarlit, and Taylor & Francis   **[2018 - Now]**
https://publons.com/researcher/3848958/amir-tabadkani/

Patent

Smart Transformable Shading System Based on Different Climates   **2020**

Publisher: The United States Patent and Trademark Office (USPTO)

Application NO.: US20180216399A1

Fund: Grant Award of US$9,500 by 'The Organization of Support Fund of Technology and Researchers', The Iranian Presidency.

https://patents.google.com/patent/US20180216399A1/en?inventor=Seyed+Amir+Tabadkani

Awards

Graham Treloar Research Prize (Deakin University)

As the most outstanding HDR student publication in relation to embodied energy and sustainability in   **2021**
2020

Early Career Research (ECR) Performance Support Fund (Deakin University)   **2021**

Publishing two Q1 cross-disciplinary publications in 2021 | Fund: AU$1000

Nearly-zero Energy Building Design – ZEB National Award, Iran   **2018**

Awarded 1st Prize | Amount: IR Rls. 15,000,000

> **Role:** Leader of the Team
>
> **Responsibilities:**

- Optimizations including form finding and envelope construction material;
- Annual daylighting and glare simulations for indoor spaces;
- Energy modeling and delivering final energy consumption;
- Modeling renewable energies through applying photovoltaic panels on the roof

> **Achievements:**

- Proposing an energy efficient office building by consuming 65.83 kwh/m^2.year;
- Glare-free indoor spaces for users;
- Sufficient indoor daylight to reduce lighting energy loads;
- Producing renewable energies up to 84.55 kwh/m^2.year by solar panels;
- Delivering a Plus-Energy office building.

Academic Experiences

International

Presentation | 6th International Symposium on Occupant Behavior (EBC Annex 79)   **2020**

Australia

Research Assistant | ARC Linkage Project: A collaboration between Deakin University   **[2021 - Now]**
and FormFlow

My responsibility: Analyzing the building energy performance by applying a newly-introduced cellular flooring prototype for Australian construction market

Presentation | "Sustainable Research Showcase" (Australian Institute of Architects)   **2021**

Teaching Assistant | Deakin University, School of Architecture and Built Environment,   **2020 - 2021**
Geelong, Australia

Unit: "Building Environmental Studies (SRT257)"

Iran

Lecturer | Binaloud Institute of Higher Education, Mashhad, Iran   **[2016 - 2017]**
Unit: "Climatic Conditions Control & Environmental Conditions Control"

Presentation | Ferdowsi University of Mashhad, Iran   **2018**
Topic: 'The role of simulators in building energy management decisions' (2 hours)

Presentation | Niroo Research Institute (NRI) Ministry of Energy, Iran   **2017**
Topic: 'The role of simulators in building energy management decisions' (2 hours)

Presentation | Khavaran University of Mashhad, Iran **2016**
Topic: 'An introduction to building energy simulation tools' (2 hours)

Workshop Instructor | Private sector, Mashhad, Iran **2018**
Topic: Parametric building's energy simulation by Grasshopper environmental plugins (18 hours)

Workshop Instructor | Birjand University, Iran **2016**
Topic: Building energy simulations with an introduction to a parametric tool called Grasshopper and Ladybug-tools (4 hours)

Environmental Sustainable Design (ESD) Experiences

UPGREENGRADE CO. – (Co-Founder) Building Performance Analyst | Mashhad, Iran **[2015 - Now]**

Primary responsibilities:

- Researching on new methods for delivering new sustainable solutions and insights;
- Comparing different design scenarios and their impacts on energy and daylighting performance;
- Energy modeling and calculating building performance of offices and residential buildings;
- Daylight modeling and simulation;
- Optimizing initial design scenarios and form finding at early stage of architectural design;
- Calculating potentials of renewable energy sources like solar panel installations;
- Collaborating with mechanical and electrical engineers for sizing air-conditioning systems and lighting;
- Delivering construction details of facade in terms of insulation, air-tightness, thermal bridges, and condensation risks.

Achievements:

- Delivering optimum positions of the building mass with respect to the project demands;
- Energy modeling of multiple ESD projects, including: 2-storey primary school building (18 classes), SADR international hotel, high-rise office building of Iranian Oil Company, Istanbul residential building;
- Delivering well-daylit and glare-free environments in projects through shading systems;
- Online teaching of energy and daylight simulation tools, including: EnergyPlus, Grasshopper plugins (Ladybug, Honeybee, and DIVA), Energy Management System, and DesignBuilder.
- Environmental designing of a 24-storey residential building, including:
    - Finding the optimum architectural mass with regards to solar radiation studies,
    - Optimizing window-to-wall ratio, construction details and shading systems in conceptual phase,
    - Energy and daylight modeling and simulation,
    - Improving the energy performance by 20% comparing to the ASHRAE 90.1 (2010) baseline model.

Architectural Design Experiences

NOMEL TOOS Executive Firm – Remote Architectural Designer | Mashhad, Iran **[2012 - 2016]**

Primary responsibilities:

- Facade design and delivering construction details;
- Developing connections and hierarchy from urban perspective to building scale by landscaping;
- Collaborating with structural engineers;
- Delivering architectural layouts from conceptual sketches to construction details;
- Checking and editing drawings through a back and forth approach with structural and mechanical engineers.

Achievements:

- Conceptual urban layout for an island in Ryazan, Russia;
- Designing facade construction details of a 25-storey residential building;
- Revising architectural drawings and plans for Imam Reza Hotel;
- Interior designing of low-rise residential buildings;

FARADID Architectural Group – Architectural Assistant | Mashhad, Iran   **[2011 - 2012]**

Primary Responsibilities:

- Interior designing and three-dimensional renderings;
- Facade design and material selections;

Achievements:

- Interior designing of multiple residential buildings;
- Designing facade layouts and construction details;
- Revising multiple given architectural layouts from other disciplines;
- Built relationships with potential new customers;
- Mastered new concepts in industry and construction phase quickly;
- Tackled projects that had been abandoned by former staff.

🎗️*Certifications*

Data Science for Construction, Architecture and Engineering   **2020**

|Issuer: EDX e-learning (ID: e566e3046b1c4809b2d8365e544285d6)|

SEB-AUDIT-Advanced Energy Audit and Simulation in Building by DesignBuilder   **2016**

|Issuer: NEON AS and Design Builder Ltd (UK)|

Building Performance Analysis Certificate (BPAC)

|Issuer: The Autodesk Education Team| **2014**

🌳*Technical Skills*

Energy & (Day)lighting Analysis

EnergyPlus & EMS, Rhino/Grasshopper Environmental Plugins (Ladybug-tools, HoneybeePlus, Butterfly & ClimateStudio), WINDOW & THERM, DesignBuilder, OpenStudio, Multi-objective Optimizations, Dialux EVO

Data Science & Programming

Python Language

2D & 3D Modeling

AutoCAD, Revit Architecture, 3Ds Max & VRAY, Rhinoceros, SketchUp, Lumion

Graphical Presentation & Documentation

Microsoft Office Package, Freehand Sketching, Adobe Photoshop, Adobe Illustrator, Adobe After Effect

🌐*Languages*

Persian - Mother tongue   **English -** Proficient   **Italian -** Average

👤*References*

Dr. Astrid Roetzel	Senior Lecturer at Deakin University	astrid.roetzel@deakin.edu.au
Dr. Hong Xian Li	Senior Lecturer at Deakin University	hong.li@deakin.edu.au
Prof. Aris Tsangrassoulis	Senior Lecturer at University of Thessaly	atsagras@arch.uth.gr
Dr. M.Reza Hosseini	Associate Head of Research at Deakin University	reza.hosseini@deakin.edu.au
Dr. Saeed Banihashemi	Assistant Professor at Canberra University	Saeed.Banihashemi@canberra.edu.au
Mr. M. Hossein Abbasi	Healthy Building Specialist at WSP in Chicago	mabbasi2@hawk.iit.edu
Mrs. Zamaneh Khoshdel	Associate Project Lead at Inhabit Group, Melbourne	zamaneh.khoshdel@inhabitgroup.com