

Arman Nikkhah Dehnavi

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ABOUT ME

I am a building science researcher, data analyst and computer programmer with 7 years of experience in Iran. I have a Master's degree in Building Science from the University of Shahid Beheshti, where I worked on developing a novel method for building performance simulation using data-driven method. I have also been involved in several research projects that integrate AEC and data science, such as analyzing building performance data, developing smart building applications, and creating data visualization web-tools. I am currently a lecturer in data science for architecture at IBPSA-Iran, where I share my knowledge and experience with students and professionals who want to learn how to apply data science techniques to building design and operation. I am passionate about exploring interdisciplinary fields to advance building science and find innovative solutions for the challenges of the built environment.

EDUCATION

Master of science, building science, Shahid beheshti university, August 2020-August2023

Thesis: The development of the early stage web-based application in building performance simulation (case study: prediction of fire evacuation in public buildings)

GPA:(3.92/4.00)

Bachelor of Architectural Engineering (BSc), Art university of Isfahan, August 2015-August 2020

Final project: The development of the 5D model for a stadium for 3000 people in the southern part of Isfahan. Iran. (BIM approach)

GPA: (3.76 /4.00)

EMPLOYMENT

International Building performance simulation association (IBPSA-Iran)

April 2021- present

Lecturer in data science for building science

- Taught courses on building science, data analysis, programming, research method to undergraduate and graduate students

- data driven methods in building performance simulation:
 - Statistical modeling and machine learning techniques (supervised-unsupervised methods)
- python (programming language)

- Designed course materials, assignments, exams, etc. based on learning objectives and outcomes
- Evaluated student performance and provided feedback and guidance
- Engaged in curriculum development and improvement activities
- Consulting and giving research method advice to students.

BSPsim .co

August 2021 - present

- Research and development (focused on web-based application in building performance simulation)
- python developer
- data scientist

University of Shahid Beheshti (SBU)

March 2021 - present

Research assistant ,architecture and urban design department

- Analyzed data from experiments, simulations, surveys, etc. using various tools and techniques
- Prepared reports, papers, posters, slides, etc. for dissemination of research findings
- Collaborated with other researchers, engineers, architects, etc. on multidisciplinary projects

Technical assistant , architecture and urban design department

- Developed and implemented algorithms and models for building performance optimization and prediction

WORK EXPERIENCE

As a developer and researcher:

Fabinnov Innovation Center, University of Isfahan, Isfahan, Iran

July 2020 -August 2021

Role: Researcher – Arduino developer

Project: Research about the improvement of children with special needs by architectural design. RANGo is one of our innovations that help children with autism to improve their abilities. RANGo hears a sound from a musical instrument and makes a digital color pencil to paint in touchscreen LCD.

Project: Designing an Evaporative Shading System to reduce energy consumption in hot and aired area. performance of the ESS is evaluated in real environment and simulation software.

Building performance research group (PRG), Isfahan, Iran

July 2019 - August 2021

Role: founder –data analyst

Data analyzing in building performance simulation researches – Consulting and giving advice to researcher

As an architect:

More office (Architectural Office), Isfahan, Iran

2016-2019

Role: Co-founder - architect-junior data analyst in building projects

Project: Golsar Gym

2019

Design Collaborated in developing the final design idea. Prepared the design maps. Advised clients on the project feasibility and cost-effectiveness.

Project: Karako Cofe

2018

Design Collaborated in developing the final design idea. Prepared the design maps. Advised clients on the project feasibility and cost-effectiveness.

Project: Joft Shish Cofe

Collaborated in developing a design idea and in the final fabrication.

2017

Project: Heart Health Clinic

Design Collaborated in developing the final design idea. Prepared the design maps. Advised clients on the project feasibility and cost-effectiveness.

Project: MARAL gym

2016

Collaborated in developing the final design idea. Prepared the design maps. Advised clients on the project feasibility and cost-effectiveness.

SKILLS

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- | | |
|--------------------------------|------------------|
| • Python(programming language) | • AutoCAD |
| • Arduino | • SketchUp |
| • SPSS | • Design Builder |
| • Grasshopper | |
| • smart PLS | |

RESEARCH METHODS

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- Machine learning and statistical learning algorithms
 - Generative adversarial neural network(VAE-pix2pix)
 - Convolutional neural network
 - Natural language processing
 - Optimization algorithms(GA-NSGA2-NSGA3-RBF)
 - Sensitivity analysis (*SHAP*)
 - Hypothesize tests (parametric and non-parametric test)
 - Fuzzy inference systems
 - Structure equation modeling

RESEARCH EXPERIENCE

Scientific journal papers:

Early Design Stage Evaluation of Architectural Factors in Fire Emergency Evacuation of the Buildings Using Pix2Pix and Explainable XGBoost Model

Journal of Building Performance Simulation

DOI:<https://doi.org/10.1080/19401493.2022.2163422>

Targeting modular adaptive façade personalization in a shared office space using fuzzy logic and genetic optimization

Journal of Building Engineering

DOI:<https://doi.org/10.1016/j.jobbe.2023.106118>

Estimating the Impact of Occupants' Behaviour on Energy Consumption by Pls-SEM: A Case Study of Pakdel Residential Complex in Isfahan, IRAN

Frontiers in Sustainable Cities

DOI: <https://doi.org/10.3389/frsc.2022.700090>

Feasibility Study for Poverty Alleviation by Energy Production Through Photovoltaic Panels in Underprivileged Areas of Iran

journal of renewable and new energy

DOI: https://www.jrenew.ir/article_161990.html?lang=en (10.52547/jrenew.10.1.138)

Conference papers:

Compilation of structural components estimation method; Case example: steel and concrete moment frame residential buildings in Tehran (in Persian)

The First International Conference on Built Environment in Digital Age

Application of Machine Learning Methods in the Analysis of Building Emergency Evacuation at Early Design Stages 4th International Conference on Civil Engineering, Architecture, Art and Urban Design

Productivity management of construction machinery in large civil engineering projects of Isfahan Municipality

13th international project management conference

Volunteer Project:

Design for Children with Autism

Role: Research, Arduino developer

Location: Fab Lab, University of Isfahan, Isfahan, Iran

July 2020 -August2021

•An interdisciplinary research project started with an innovative idea related to human emotions, which led to three prototypes in interactive Serious Game and Design. (Currently in the stage of testing and evaluating in university of Illinois Urbana Champaign)

RESEARCH INTEREST

Develop new Data-driven method in different types of building performance analysis:

- Energy consumption analysis in buildings
- Daylight simulation
- Fire evacuation(safety)
- Acoustic in buildings
- Occupant behavior

COMPETITIONS

Serious Games Competition - SEGAP 2021

September 2021 - November 2021

Organizer: University of Tehran, Tehran, Iran

Design and fabrication of the game prototype, prepared the final maps, documents and the final presentation.

NOVA Competition : (1st place)

September 2020

Organizer: University of Sahid beheshti, Tehran, Iran

Developing a web-application named BSP

Evolvo Competition

December 2018 - February 2019

TEACHING EXPERIENCE

Classes as lecturer (180 student since now) :

•Data science and python programming for building science (IBPSA-iran)

2021-present

REFERENCE

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