



BERFIN YILDIZ

Ph.D Architect

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Research and Teaching Interests

*Algorithmic Thinking and Computational Design Tools
Intelligent Architecture : Machine Learning and
Deep Learning Models in Architectural Design*

EXPERIENCE

RESEARCHER

COST ACTION CA21103 | Implementation of Circular Economy in the Built Environment | 2024 - PRESENT

THE DESIGN AND COMPUTATION (DCG) RESEARCH GROUP | 2023 - PRESENT

University of Lisbon, Faculty of Architecture (FAULisboa)

VISITING SCHOLAR

THE DESIGN AND COMPUTATION (DCG) RESEARCH GROUP | | Lisbon, PORTUGAL | 01.2023 - 07.2023

*TUBITAK 2214-A - International Research Fellowship Programme for PhD Students

RESEARCH AND TEACHING ASSISTANT

YASAR UNIVERSITY | Izmir, TURKIYE | 10.2016 - PRESENT

Yasar University, Faculty of Architecture, Department of Architecture

EDUCATION

Ph.D (4,00 / 4,00)

ITU | Istanbul, TURKIYE | 09.2017 - 10.2024

Istanbul Technical University, Department of Informatics, Architectural Design Computing

*TUBITAK 2211-C National PhD Scholarship Program in the Priority Fields in Science and Technology

Thesis title : *"Artificial Intelligence Approach in Architectural Design: Recognition of Space Functions with Machine Learning and Architectural Plan Generation with Generative Adversarial Networks"*

M.Sc (3,88 / 4,00)

ITU | Istanbul, TURKIYE | 09.2015 - 06.2017

Istanbul Technical University, Department of Informatics, Architectural Design Computing

Thesis title : *"An Agent-based Model Proposal to Simulate User Movements in Public Spaces : Izmir Konak Square"*

B.Sc (3,29 / 4,00)

YASAR UNIVERSITY | Izmir, TURKIYE | 09.2010 - 06.2015

* Graduated as the third-ranked student in the Department of Architecture from Yasar University

PUBLICATIONS

INTERNATIONAL PEER-REVIEWED JOURNAL ARTICLES

Yildiz B., Cagdas G. and Zincir I. (2023) *"Architectural Space Classification Considering Topological and 3D Visual Spatial Relations using Machine Learning Techniques"*, Building Research and Information, Vol. 52, pp. 68-88.
(SCI-Expanded , Q1- Building and Construction)

Yildiz B., and Cagdas G. (2021) *"Agent-based Modeling for User Movements using Fuzzy Logic"*, JCoDe: Journal of Computational Design, Vol. 2(1), 243-264.

Yildiz B. and Cagdas G. (2020) *"Fuzzy logic in Agent-based Modeling of User Movement in Urban Space: Definition and Application to a Case Study of a Square"*, Building and Environment, Vol. 169.
(SCI-Expanded , Q1- Building and Construction)

Morales Beltran M.G. and **Yildiz B.** (2020) *"Integrating Configuration-based Seismic Design Principles into Architectural Education: Teaching Strategies for Lecture Courses"*, Architectural Engineering and Design Management, Vol. 16(4), pp. 310-328.
(SCI-Expanded , Q1- Architecture)

INTERNATIONAL PEER-REVIEWED CONFERENCE PROCEEDINGS

Yıldız B., Cagdas G. and Zincir I. (2024) "Automated Two-Story Housing Floor Plan Generation using Generative Adversarial Networks", 7th International Symposium on Formal Methods in Architecture (7FMA), Porto, Portugal, Dec 3-6.

Yıldız B., Cagdas G. and Zincir I. (2023) "Deep Architectural Floor Plan Generation: An Approach for Open-planned Residential Spaces", 11th International Conference of the Arab Society for Computation in Architecture, Art and Design (ASCAAD), C+++: Computation, Culture and Context, Amman, Jordan, Nov. 7-9, pp.685-705.

Yıldız B., Cagdas G. and Zincir I. (2022) "Floor Plan Recognition Considering Visual and Spatial Relations Through Machine Learning", International Graduate Research Symposium (IGRS), Istanbul, Türkiye, June 1-3, pp.104-113.

Yıldız B., Ekici B., Kutucu S., Chatziconstantinou I. and Sariyildiz S. (2017) "Visual Perception-based Multi-Objective Optimization to Housing Design in Urban Context", International Symposium for Product Research (ISPR), Wien, Austria, Sep. 13-15, pp.903-914.

NATIONAL PEER-REVIEWED CONFERENCE PROCEEDINGS

Yıldız B. and Özbey F. (2018) "Multi-Objective Discrete Optimization of ETICS in terms of Thermal and Embodied Energy Performance", 12. Mimarlıkta Sayısal Tasarım Sempozyumu (MSTAS), Süleyman Demirel Üniversitesi, Isparta.

Yıldız B. and Aktaş B. (2017) "Decision Making in the Architectural Design Process: Fuzzy Logic Based Facade Model Proposal", 11. Mimarlıkta Sayısal Tasarım Sempozyumu (MSTAS), Orta Doğu Teknik Üniversitesi, Ankara.

Aktaş B. and **Yıldız B.** (2016) "A simulation model: Analysis of User Movements in Ortakoy Square", 10. Mimarlıkta Sayısal Tasarım Sempozyumu (MSTAS), Bilgi Üniversitesi, İstanbul.

INTERNATIONAL BOOKS OR CHAPTERS

Yıldız B., Cagdas G. and Zincir I. (2024) "Automated Two-Story Housing Floor Plan Generation using Generative Adversarial Networks", In: Marques B., Ruivo, C., Viana, D.L., Vieira Vaz, J. (eds) *Formal Methods in Architecture. FMA 2024. Digital Innovations in Architecture, Engineering and Construction*. Springer, Switzerland. (In-press).

ACADEMIC ACTIVITIES

INVITED LECTURES / PRESENTATIONS

IZMIMOD | Summer Event Series by the Chamber of Architects Izmir

2024 -25 Academic Year | "Artificial Intelligence in Architectural Design: Machine and Architect"

ITU | Department of Informatics | MBL 602 Decision Support Systems in Architectural Design, Prof. Gülen Çağdaş

2023 -24 Academic Year | "Decision making under uncertainty: Fuzzy Logic"

2023 -24 Academic Year | "Exploration Patterns in Complex Datasets: Machine Learning"

2022 -23 Academic Year | "Decision making under uncertainty: Fuzzy Logic"

UCL| Bartlett School of Architecture | Architecture and Machine Intelligence, Assoc. Prof. Tasos Varoudis

2023 -24 Academic Year | "Floor Plan Generation Through Multi-Modality Data Representation and Deep Learning Techniques"

Penn State University| Stuckeman Center for Design Computing (SCDC), Prof. Jose Duarte

2021 -22 Academic Year | "Generative Floor Plan Models using Generative Adversarial Networks (GANs)"

Yasar University| Department of Interior Architecture and Environmental Design, INAR 4451 Street Furniture Design, Lec. Rena Vanlı Ballar

2020 -21 Academic Year | "User Movements in Public Spaces"

COURSES TAUGHT

Yasar University| Department of Architecture, 2024- 2025

• **ARTIFICIAL INTELLIGENCE IN ARCHITECTURAL DESIGN:** Gained proficiency in computational methods and artificial intelligence applications for architectural design, including data-driven problem formulation, solution search, and decision-making support. Developed skills in analyzing architectural data and presenting findings in a scientific format.

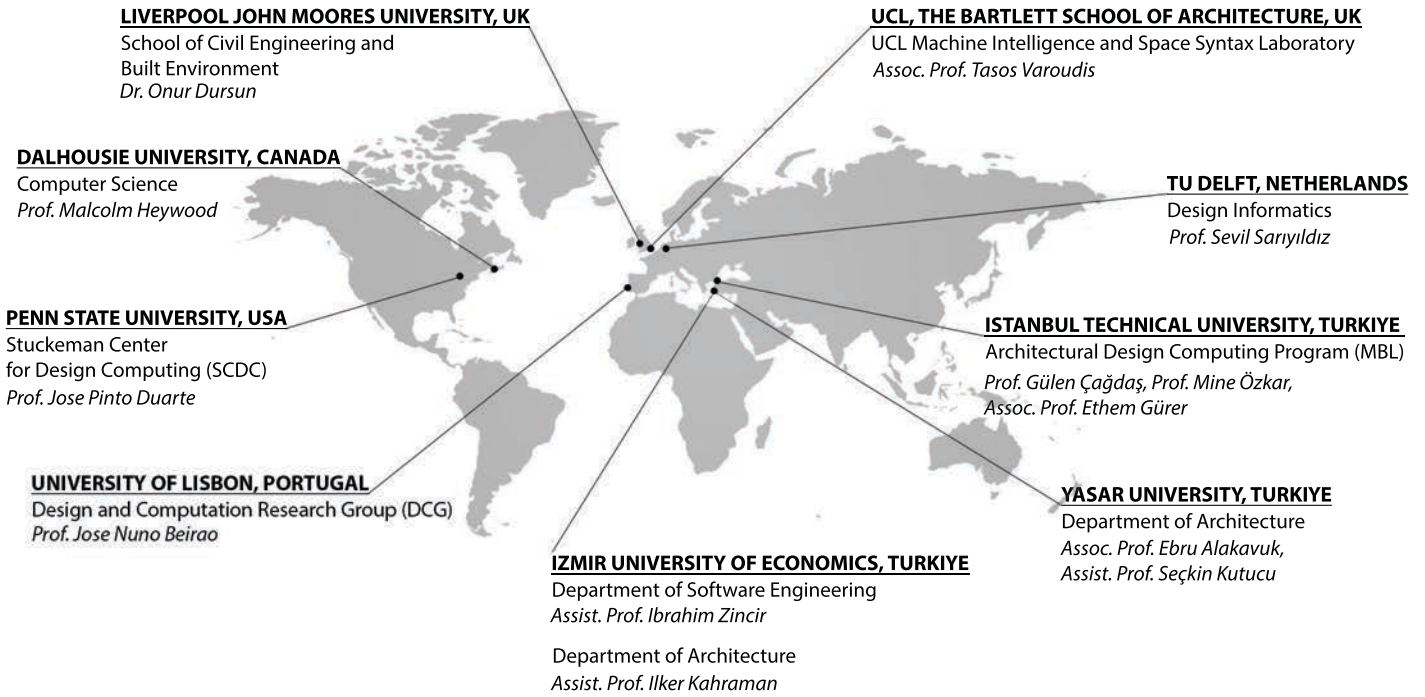
• **ARCHITECTURAL DESIGN I - II:** Guided students on the importance of context, spatial organization, and the distinction between public and private spaces in the development of design concepts.

TEACHING ASSISTANTSHIP

Yasar University| Department of Architecture, 2016- 2024

- **INTRODUCTION TO COMPUTATIONAL DESIGN** : Focused on the fundamentals of computational design and algorithmic approaches to spatial design, concentrating on the use of computational tools (Rhino and Grasshopper) throughout the design process.
- **BASIC DESIGN I - II** : Taught basic design principles, encouraging students to generate unique design approaches and develop ways to realize them through systemic thinking, rule-based design systems and decision-making processes.
- **ARCHITECTURAL DESIGN I - II**: Guided students on the importance of context, spatial organization, and the distinction between public and private spaces in the development of design concepts.
- **ARCHITECTURAL DESIGN III - IV**: Encouraged students to integrate sustainable design principles and collaborative teamwork to develop innovative architectural solutions. Fostered a collaborative environment that addressed eco-friendly strategies.
- **ARCHITECTURAL DESIGN V - GRADUATION PROJECT**: Provided support and guidance to students in developing comprehensive, innovative solutions that integrate urban context and design principles to address complex mixed-used design challenges.
- **BUILDING TECHNOLOGIES I - II - III** : Taught students the key concepts of the structural systems, construction details, and material implementation in architectural design, focusing on integrating computational tools for efficient design and construction workflows.
- **BUILDING PROJECT MANAGEMENT**: Provided students with knowledge in lifecycle management, covering building cost analysis and the application of Building Information Modeling (BIM) for effective project planning and execution.

COLLABORATIONS



REFERENCES

Prof. Gülen ÇAĞDAŞ | PhD and Master's Advisor
Istanbul Technical University, Department of Informatics, Architectural Design Computing
cagdas@itu.edu.tr

Assist. Prof. Ibrahim ZİNCİR | PhD Co-Advisor
Izmir University of Economics, Department of Software Engineering
ibrahim.zincir@ieu.edu.tr