Raheleh Biglari

Antwerp, Belgium ra.biglari@gmail.com +32 494 85 22 50
https://rahelehbiglari.github.io/ raheleh-biglari
https://github.com/rahelehbiglari

About

Raheleh Biglari got her PhD in Applied Engineering, focusing on Modelling and Simulation and Digital Twins at the University of Antwerp, Cosys-Lab research group. Her research focuses on modelling & simulation, adaptive systems, and digital twins, with growing emphasis on applying AI, including machine learning, deep learning, and reinforcement learning, to these domains. Specifically, she is interested in performance modelling, proposing methods, tools, and techniques for computational problems.

She got her M.Sc. degree in Computer Engineering at the Azad University in Tehran in 2014. She was a lecturer at the University of Applied Science and Technology in Iran. She has experience working at ICAN Company (Software Solutions) and MCAC Company (banking services and solutions).

Education

PhD **University of Antwerp, Belgium**, Applied Engineering — Jan 2021 – June 2025

- **Dissertation:** Foundations for Self-Adaptive Abstraction and Approximation in Digital Twins with Real-time Requirements, Under the supervision of Prof. Dr. Joachim Denil in Cosys-Lab -
  Available here: `https://repository.uantwerpen.be/docstore/d:irua:29238`

MSC **Islamic Azad University (IAU), Iran** , Computer Software Engineering — Oct 2010 – Feb 2014

- **Thesis:** Improving density-based clustering algorithm in spatial Database, Under the supervision of Prof. Dr. Alireza Bagheri

BS **Payame Noor University, Iran**, Computer Software Engineering — 2003 – 2007

- **Thesis:** Agent-Oriented Software Engineering (AOSE) and Its Methodologies Under the supervision of Prof. Dr. Saeed Farzi

Additional Training

- Excellence in peer review: how to be an effective peer reviewer, Operational Research Society, January 2025
- The basics of Innovation & Entrepreneurship / Module 3: The Business Model Canvas and how to apply it to your own research, University of Antwerp, 2025
- Summer School CityLAB X: The Sustainable City: An Integrated Perspective, University of Antwerp, 2024
- Digital Twins, University of Michigan, 2023

Work Experience

University of Antwerp, PhD Researcher — Antwerp, Belgium
Jan 2021 - March 2025

- **Research topic:** *Foundations for Self-Adaptive Abstraction and Approximation in Digital Twins with Real-time Requirements*. Under the supervision of Prof. Dr. Joachim Denil in Cosys-Lab research group.
- **Responsibilities:** Research, Lesson Planning, Teaching DigitalTwin and Functional Safety lab of cyber-physical system course, Co-Supervising Master and Bachelor students theses, Teaching assistance

Vrije Universiteit Brussel , Researcher — Brussels, Belgium, Feb 2020 - Sep 2020

- **Research topic:** *Smart Adaptive Scheduling in Safety-Critical Systems*, Under the supervision of Prof. Dr. Ir. Martin Timmerman in EmSlab, ETRO research group.
- **Responsibilities:** Research, Teaching assistance

Mabna Card Aria (banking services and solutions), Software and Data Analyst-Software Tester and Software technical support — Tehran, Iran, 2019 – 2020

- **Responsibilities:** Technical support, Data Analysis, Software testing, Software Documentation

Freelance, Web Designer — Tehran, Iran, 2017 – 2019

ICAN Engineering Group (Software Solutions), Software Technical Support — Tehran, Iran, 2014 – 2016

- **Responsibilities:** Technical Support, Software Support, Software Documentation, Software Project Management

University of Applied Science and Technology, Lecturer — Tehran, Iran, 2012 – 2013

- **Responsibilities:** Teaching Computer Science & Software Engineering courses

Tehran Institute of Technology, Lecturer — Kermanshah, Iran, 2012 – 2013

- **Responsibilities:** Teaching MCSE (Microsoft Certified Solutions Expert) Windows Server Training Course

Tehran Municipality, Project Assistant — Tehran, Iran, 2008 – 2012

- **Responsibilities:** Budget Tracking, Budget Forecasting, Budget Analysis, Project Analysis (physical and financial progress)

Research Engagement

Visiting Researcher, Department of Electrical and Computer Engineering Software Engineering & Computing systems, Aarhus University, Denmark — 10-11/2024

Research Stay, IMS lab, University of Bordeaux, France — 6/2023

Journals

- SIMULATION Journal: Transactions of The Society for Modeling and Simulation International (since 2023) — Reviewer
- SoSym Journal: International Journal on Software and Systems Modeling (since 2023)

Conferences/Scientific Events

- Annual Simulation Symposium (ANSS) at ANNSIM, 2025 — Co-chair
- CPS/DT track at ANNSIM'25, Annual Modeling and Simulation Conference (ANNSIM), 2025 — Program Committee member and reviewer
- Symposium on Simulation for Architecture and Urban Design (SimAUD) at ANNSIM, 2025
- Winter Simulation Conference (WSC) (since 2023)
- GirLS leading in science 2024-2025, 2025-2026, Belgium — Organising Committee Member
- WiseNight 2025, part of European Researchers Night, 2025, Belgium
- Erasmus Blended Intensive Programme (BIP) on Model-based Systems Engineering for Digital Twin System (MBSE4DT) (3 ECTS credits), University of Antwerp, Oct-Dec 2024.

Research Interests

- Modelling & Simulation
- Machine Learning
- System Adaptation
- Digital Twin
- Software Engineering
- Algorithms

Teaching

- Lecturer: Cyber-Physical Systems I (CPS I) - Digital Twin Lab, Functional Safety Lab - Main Lecturer: Prof. dr. Joachim Denil - 2023-2025 — University of Antwerp, Belgium
- TA: Cyber-Physical Systems II (CPS II) - Main Lecturer: Prof. dr. Joachim Denil - 2022-2025
- Co-promoter of Bachelor and Master students Theses - 2021-2024
- TA: Numerical Modelling and Simulation - Main Lecturer: Prof. dr. Joachim Denil - 2021-2023
- TA: Operating Systems and Security - Main Lecturer: Prof. dr. Martin Timmerman - 2020-2021 — VUB, Belgium
- TA: Software and Engineering for Embedded Systems - Main Lecturer: Prof. dr. Martin Timmerman - 2020-2021
- TA: Advanced Algorithms - Main Lecturer: Prof. dr. Alireza Bagheri — Amirkabir University of Technology, Iran
- Lecturer: Fundamentals of Programming, Object-Oriented Programming, Software Engineering II, Data Structures & Algorithms, Databases, Linux, Technical and Scientific Presentation, Academic English — University of Applied Science and Technology, Iran

(CO)-SUPERVISION

- Towards a Digital Twin of a Traffic System Using Self-adaptive Abstraction and Approximation, Master Thesis, 2024
- Real-time Simulation Environment with Surrogate Model in a Hardware-In-the-Loop System, Master Thesis, 2023
- Comparison of RTOS Scheduling Algorithms, Bachelor Thesis, 2022
- Scheduling in Mixed Criticality Cyber-Physical Systems, Master Thesis, 2022

Honor

Ranked 62nd among thousands of participants in the National Entrance Exam for Master's Programs (Konkur-e Karshenasi Arshad), Iran, 2010 (in Computer Engineering)

Membership

- BeWiSE (Belgian Women in Science), Belgium: Board Member
- ACM-W Europe: Communications Team, Website Manager
- SIGSIM (ACM Special Interest Group on Simulation and Modeling): Member
- Engineering Digital Twin (EDT) community: Member
- Student Member of ACM (2021-2025)

Languages

English (C1), French (A2/B1), Dutch (A2), Persian (Native)

Publications

- R. Biglari and J. Denil, “Foundations for Model Switching in Digital Twins with Real-time Requirements,” *SIMPAT* Journal, 2025, ready to submit.
- R. Biglari and J. Denil, “Decision Oriented Technique (DOTechnique): Finding Model Validity Through Decision-Maker Context,” arXiv preprint arXiv:2510.13858, 2025.
- R. Biglari, C. Gomes, and J. Denil, “Towards a validity frame of multi-modal surrogate models for traffic simulation,” in 2025 Annual Modeling and Simulation Conference (*ANNSIM*), 2025, In press.
- Z. Ali, R. Biglari, J. Denil, J. Mertens, M. Poursoltan, and M. K. Traoré, “From modeling and simulation to digital twin: evolution or revolution?” *SIMULATION*, vol. 100, no. 7, pp. 751–769, 2024.
- R.Biglari, J.Denil, "Real-time adaptive abstraction and approximation using validity frames: an experience report", publisher: arXiv, arXiv:2303.07144, 2023.
- R. Biglari and J. Denil, “Model validity and tolerance quantification for real-time adaptive approximation,” in 2022 Proceedings of the 25th International Conference on Model Driven Engineering Languages and Systems: Companion Proceedings, ser. *MODELS ’22*. Montreal, Canada, 2022.
- R. Biglari, J. Mertens, and J. Denil, *“Towards Real-time Adaptive Approximation,”* in 2022 11th European Congress Embedded Real Time Systems - *ERTS 2022*, Toulouse, France, Jun. 2022.
- R.Biglari, A. Bagheri, "PPreDeCon : a parallel version of preference density connected clustering algorithm" *International journal of computer applications* vol.: 107 issue: 1 pag.: 22 - 26, 2014.

Poster Presentation:

- R. Biglari and J. Denil, “An Architecture for Self-Adaptive Abstraction and Approximation in Digital Twins with Real-time Requirements”, ACM womENcourage2025, Brașov, Romania, Sep 2025.
- R. Biglari and J. Denil, “Towards Partitioned Machine Learning-based surrogate Modelling”, Flanders Make Scientific Conference for Machines, Vehicles and Production Technology, Leuven, Belgium.
- R. Biglari and J. Denil, “Self-Adaptive Abstraction and Approximation (AA) in Real-time Cyber Physical Systems”, Flanders Make Conference on Machine, Vehicle and Production Technologies, Kortrijk, Belgium.
- R. Biglari and J. Denil, “Adaptive Abstraction and Approximation in Real-time Cyber-Physical Systems (CPS)”, Flanders Make internal scientific conference, Antwerp, Belgium.
- R. Biglari and J. Denil, “Model validity and tolerance quantification for real-time adaptive approximation,” 25th International Conference on Model Driven Engineering Languages and Systems *(MODELS ’22)*. Montreal, Canada, Oct 2022.
- R. Biglari, J. Mertens, and J. Denil, *“Towards Real-time Adaptive Approximation”*, 11th European Congress Embedded Real Time Systems - *ERTS 2022*, Toulouse, France, Jun. 2022.
- R. Biglari and J. Denil, “Towards Real-time Adaptive Approximation”, Flanders Make internal scientific conference, Gent, Belgium.

In Preparation:

- R. Biglari, S. Belis, and J. Denil, “Decision-Oentric: A method for digital twins demonstrated through an autoclave use case,” manuscript in preparation.
- R. Biglari, C. Gomes, and J. Denil, “A validity frame for multi-modal surrogate models,” manuscript in preparation for submission to SIMPAT journal.

Refrees

- Prof. Dr. Joachim Denil, Associate Professor at University of Antwerp, Joachim.Denil@uantwerp.be
- Prof. Dr. Claudio Gomes, Associate Professor at Aarhus University, claudio.gomes@ece.au.dk