Fatemeh Ghassemi Esfahani
Curriculum Vitae

School of Electrical and Computer Engineering,
University of Tehran, Tehran, Iran
Phone: +98 21 82084995
E-mail: fghassemi@ut.ac.ir
Personal webpage: http://fatemehghassemi.ir//
Date of Birth: 4th July 1982

.

Positions:

● Jan. 2024-now: Head of Software Engineering Group, School of Electrical and Computer Engineering, University of Tehran

● Dec. 2011- now: Assistant Professor, School of Electrical and Computer Engineering, University of Tehran

● Dec. 2011 - now: Director of Formal Method Lab, University of Tehran

● Jun. 2014- now: Research member of High Frequency Systems and Test Lab and Advanced VLSI Circuits, University of Tehran

Educational Background:

● March. 2018: Ph.D. in Computer Science, Faculty of Applied Science, Vrije Universiteit of Amsterdam.

● Dec. 2005 – Apr. 2011: Ph.D. in Computer Engineering (Software), Department of Computer Engineering, Sharif University of Technology.

● Sep. 2004 - Nov. 2005: M.Sc. in Computer Engineering (Software), Faculty of Engineering, Isfahan University.

● Sep. 2004: B.Sc. in Computer Engineering (Software), Electronic and Computer Engineering Department, Tehran University.

● June 2000. High School Diploma in Mathematics and Physics, Exceptional Talent High School (Farzanegan Amin), Isfahan.

Research Interest:

Formal methods in software engineering, Formal modeling and analysis of cyber-physical systems, Model learning, Model checking, Protocol verification, Process algebra, Theory of programming languages, Software testing.

Achievements:

- Invited to Dagstuhl Seminar on "Model Learning for Improved Trustworthiness in Autonomous Systems", Dec 03 – Dec 08, 2023
- PhD scholarship from Vrije University of Netherlands, 2016.
- Second place in graduate students, Sharif Univ. of Tech., 2011.
- Research scholarship from Vrije University of Netherlands, 2009.
- First place in graduate students, Isfahan University, 2006.
- Best paper award, the first IPM International Workshop on Foundations of Software Engineering (FSEN 2005).
- Second place in graduate students, Tehran University, 2005.

Projects:

- Formal Analysis of Social Networks, Funded by IPM, 2021
- Classification of network Applications, Funded by IPM, 2019
- Design and Implementation of Smart Environments, High Frequency Systems and Test Lab and Advanced VLSI Circuits, 2017
- Systematic Testing of a Family of Thermostats, High Frequency Systems and Test Lab and Advanced VLSI Circuits, 2016
- Feasibility Study of Design and Construction of National Tablet, Iran Electronic Industries Organization, 2014
- Design and Implementation of National Presentation, Funded by IS-IRAN, 2012.
- Performance Evaluation of Ad hoc Networks using Process Algebra, Funded by IPM, 2011 (results were published in [14]).

Publications:

[48] Negar Kashef, Fatemeh Ghassemi, Extracting Formal Models for User's Behaviors in Social Networks using Automata and Machine Learning, *Accepted in FSEN 2025*

[47] Zahra Moezkarimi, Fatemeh Ghassemi, Efficient analysis of belief properties in process algebra. *J. Log. Algebraic Methods Program. 141*: 101001, 2024

[46] Zeynab Sabahi-Kaviani, Fatemeh Ghassemi, An encrypted traffic classifier via combination of deep learning and automata learning, *Soft Comput. 28(23):* 13443-13460, 2024

[45] Mahdi Farzandway, Fatemeh Ghassemi, SpecNLP: A Pre-trained Model Enhanced with Spectrum Profile for Bug Localization, *Proc AITest 2024*: 81-86

[44] Ramtin Khosravi, Ehsan Khamespanah, Fatemeh Ghassemi, Marjan Sirjani: Actors Upgraded for Variability, Adaptability, and Determinism, *Active Object Languages: Current Research Trends*, 2024: 226-260

[43] M. Samadi, F. Ghassemi, R. Khosravi, Decentralized Deadlock-Free Enforcement of Message Orderings in Message-Based Systems, Journal of Computer and System Sciences, Volume 144, 2024

[42] S. Riahi, R. Khosravi, F. Ghassemi, Knowledge-Related Policy Analysis in an Inference-Enabled Actor Model. J. Univers. Comput. Sci. Vol. 30, No. 4, pp. 462-501, 2024

[41] F. Marzani, F. Ghassemi, Z. Sabahi, T. van Ede, M. van Steen, "Mobile App Fingerprinting Through Automata Learning and Machine Learning", Accepted in *IFIP Networking*, 2023

[40] F. Ghassemi, M. Sirjani, E. Khamespanah, M. Mirani, H. Hojjat, "Transparent Actor Model", Accepted in *International Conference on Formal Methods in Software Eng – FormaliSE' 23*, 2023

[39] M. Samadi, F. Ghassemi, R. Khosravi, "Decentralized Runtime Verification of Message Sequences in Message-Based Systems", *Acta Informatica*, 2023, To appear

[38] M Zarneshan, F. Ghassemi, E. Khamespanah, M. Sirjani, J. Hatcliff, "Specification and Verification of Timing Properties in Interoperable Medical Systems", *Logical Methods in Computer Science*, Vol. 18, No. 2, 2022

[37] Z. Moezkarimi, F. Ghassemi, MR Mousavi, A Policy-Aware Epistemic Framework for Social Networks, *Journal of Logic and Computation*, Vol. 32, No. 6, pp. 1234-1271, 2022

[36] I. Jahandideh, F. Ghassemi, M. Sirjani, "An actor-based framework for asynchronous event-based cyber-physical systems", *Software and Systems Modeling*, Vol. 20, No. 3, pp. 641-665, 2021

[35] M. Samadi, F. Ghassemi, R. Khosravi, "Decentralized Runtime Enforcement of Message Sequences in Message-Based Systems", in *Proc. 24th International Conference on Principles of Distributed Systems*, Vol. 184, LIPIcs, pp. 21:1-21:18, 2021

[34] Z. Sabahi, F. Ghassemi, Z. Alimadadi, "Combining Machine and Automata Learning for Network Traffic Classification", in *Proc. Third IFIP WG 1.8 International Conference on Topics in Theoretical Computer Science – TTCS'20,* LNCS 12281, pp. 1-15, Springer, 2020

[33] M. Zarneshan, F. Ghassemi, M. Sirjani, "Formal Modeling and Analysis of Medical Systems", in *Proc. 22nd International Conference on Coordination Models and Language – COORD'20,* LNCS 12134, pp. 386-402, Springer, 2020

[32] M. Sirjani, E. Khamespanah, F.Ghassemi, "Reactive Actors: Isolation for Efficient Analysis of Distributed Systems", in *Proc. IEEE/ACM 23rd International Symposium on Distributed Simulation and Real Time Applications*, pp. 1-10, 2019

[31] A. Shamsaie, H. Habibi, E. Abdi, F. Ghassemi, "RUbIn: A framework for reliable and ubiquitous inference in WSNs", *Scientia Iranica*, Vol. 26, No. 6, pp. 3540-3555, 2019.

[30] S. Sabahi and F. Ghassemi, "Behavioral Model Identification and Classification of Multi-component Systems", *Science of Computer Programming*, Vol. 177, 41-66, 2019.

[29] F. Ghassemi and Wan Fokkink, "Reliable Restricted Process Theory", *Fundamenta Informaticae*, Vol. 165, No. 1, pp. 1-41, 2019.

[28] R. Abbasi, F. Ghassemi, and R. Khosravi, "Verification of Asynchronous Systems with an Unspecified Component", *Acta Informatica*, Vol. 56, No. 2, pp. 161-203, 2019.

[27] F. Ghassemi, "Verification of Mobile Ad hoc Network Processes with Data", *The CSI Journal on Computer Science and Engineering*, Vol. 15, No. 2, pp. 44-52, 2018.

[26] I. Jahandideh, F. Ghassemi, and M. Sirjani, "Hybrid Rebeca: Modeling and Analyzing of Cyber-Physical Systems", in *Proc. 8th International Workshop on Model-Based Design of Cyber Physical Systems - CyPhy'18*, LNCS 11615, pp. 3-27, 2018.

[25] M. Sirjani, F. Ghassemi, and B. Pourvatan, "Reo Connectors and Components as Tagged Signal Models", *It's All About Coordination - Essays to Celebrate the Lifelong Scientific Achievements of Farhad Arbab*, LNCS 10865, pp. 160-173, Springer, 2018.

[24] B. Yousefi, F. Ghassemi, and R. Khosravi, "Modeling and Efficient Verification of Wireless Ad hoc Networks", *Formal Aspects of Computing*, Vol. 29, No. 6, pp. 1051-1086, 2017.

[23] G. Jahandoust and F. Ghassemi, "An Adaptive Sinkhole Aware Algorithm in Wireless Sensor Networks", *Ad Hoc Networks*, Vol. 59, pp. 24-34, 2017.

[22] S. Sabahi and F. Ghassemi, "Automatic Transition System Model Identifications for Network Applications from Packet Traces", in *Proc. 7th IPM International Conference on*

Fundamentals of Software Engineering - FSEN'17, LNCS 10522, pp. 212-227, Springer, 2017.

[21] S. Riahi, R. Khosravi, and F. Ghassemi, "Purpose-based Policy Enforcement in Actor-based Systems", in *Proc. 7th IPM International Conference on Fundamentals of Software Engineering - FSEN'17*, LNCS 10522, pp. 196-211, Springer, 2017.

[20] F. Ghassemi, and W. Fokkink, "Model Checking Mobile Ad Hoc Networks", *Formal Methods in System Design*, Vol. 49, No. 3, pp. 59-189, 2016.

[19] F. Ghassemi, and MR. Mousavi, "Product Line Process Theory"*, Journal of Logical and Algebraic Methods in Programming*, Vol. 85, No. 1, pp. 200–226, 2016.

[18] M. Ahmadi, M. Gharib, F. Ghassemi, and A. Movaghar, "Probabilistic Key Pre-Distribution for Heterogeneous Mobile Ad Hoc Networks Using Subjective Logic", in *Proc. of 29th IEEE International Conference on Advanced Information Networking and Applications- AINA' 15*, pp. 185-192, IEEE Computer Society, 2015.

[17] B. Yousefi, F. Ghassemi , and R. Khosravi, "Modeling and Efficient Verification of Broadcasting Actors", in *Proc. 6th IPM International Conference on Fundamentals of Software Engineering* - FSEN'15, Tehran, LNCS 9392, pp. 69-83, Springer-Verlag, 2015.

[16] M.Razavian, N. Yazdani and F. Ghassemi, "An Analysis of Vendor Lock-in Problem in Cloud Storage", in *Proc. 3rd International eConference on Computer and Knowledge Engineering -ICCKE 2013,* 2013

[15] F. Ghassemi, S. Ahmadi, W.J. Fokkink and A. Movaghar, "Model checking MANETs with arbitrary mobility", in *Proc. 5th IPM International Conference on Fundamentals of Software Engineering - FSEN'13*, Tehran, Vol. 8161 of LNCS, pp. 217-232, Springer, 2013

[14] F. Ghassemi, M. Talebi, A. Movaghar and W.J. Fokkink, "Stochastic Restricted Broadcast Process Theory", in *Proc. 8th European Performance Engineering Workshop - EPEW'11*, Borrowdale, UK, Vol. 6977 of LNCS, pp.72-86, Springer, 2011.

[13] F. Ghassemi, W.J. Fokkink and A. Movaghar, "Verification of Mobile Ad hoc Networks: an Algebraic Approach", *Theoretical Computer Science*, Vol. 412, No. 28, pp. 3262-3282, 2011.

[12] F. Ghassemi, W.J. Fokkink and A. Movaghar, "Equational Reasoning on Mobile Ad-hoc Networks", *Fundamenta Informaticae*, Vol. 103, No. 1, pp. 1-41, 2010.

[11] F.Ghassemi, A. Movaghar and W.J. Fokkink, "Towards Performance Evaluation of Mobile Ad hoc Network Protocols", in *Proc. 10th International Conference on Application of Concurrency to System Design - ACSD'10,* Braga, Portugal, pp. 85-92, IEEE Computer Society Press, 2010.

[10] F. Ghassemi, W.J. Fokkink and A. Movaghar, "Equational Reasoning on Ad hoc Networks", in *Proc. 3rd Conference on Fundamentals of Software Engineering - FSEN'09*, Kish Island, Iran, Vol. 5961 of LNCS, pp. 113-128, Springer, 2009.

[9] F. Ghassemi, W.J. Fokkink and A. Movaghar, "Restricted Broadcast Process Theory", in *Proc. 6th Conference on Software Engineering and Formal Methods - SEFM'08*, Cape Town, South Africa, pp. 345-354, IEEE, 2008.

[8] A. Ghassempouri, F. Ghassemi, and A. Movaghar, "A New Tool for Model Checking of Probabilistic Constraint Automata", in *Proc. 13th International Computer Conference of CSI - CSICC'08*, Kish Island, Iran, 2008 (In Persian).

[7] F. Ghassemi and A. Movaghar, "Formal Modeling Routing Protocols in Mobile Ad-hoc Networks", *CSI Journal on Computer Science and Software Engineering*, Vol. 5, No. 2&4, pp. 46-55, 2007.

[6] F. Ghassemi and A. Movaghar, "Modeling Routing Protocols in Ad hoc Networks", in *Proc. 13th International Computer Conference of CSI - CSICC'08,* Kish Island, Iran, Vol. 6, pp. 419-426, Springer, 2008.

[5] A. Shamsaie, J. Habibi and F. Ghassemi, "Tierpeer: A Three-Tier Framework for P2P Applications", *International Journal of Computer Science and Network Security,* Vol. 7, No. 2, pp. 292-301, 2007.

[4] F. Ghassemi, S. Tasharofi and M. Sirjani, "Automated Mapping of Reo to Constraint Automata", in *Proc. first International Conference on Fundamental of Software Engineering – FSEN'05*, Iran, Vol. 159 of ENTCS, pp. 99-115, Elsevier, 2006.

[3] F. Ghassemi, N. Nemat-Bakhsh, B. T. Ladani and M. Sirjani, "A Formal Model for Coordination Behavior of the Organization in Multi Agent Systems", in *Proc. second International Conference on Information & Communication Technologies: from Theory to Applications – ACTTA'6*, Syria, IEEE, 2006.

[2] F. Ghassemi, N. Nemat-Bakhsh, B. T. Ladani and M. Sirjani, "Specification and Implementation of Multi-Agent Organizations", in *Proc. second International Conference on Web Information Systems and Technologies – WEBIST'06*, Portugal, pp. 447-453, 2006.

[1] F. Ghassemi, N. Nemat-Bakhsh, B. T. Ladani and M. Sirjani, "A Formal Model for Organization of Multi-agent Systems", in *Proc. the Symposium on Information Technology Development*, Iran, 2005.

Professional Activities

● 	Publication chair of the International Symposium on Real-time and Embedded Systems and Technology (RTEST), 2018

● PC member of International Conference on Fundamentals of Software Engineering (2011, 2013, 2015, 2017, 2019, 2021,2023), The Second IFIP International Conference on Topics in Theoretical Computer Science (2017,2015), First International Workshop on Formal Methods for and on the Cloud (2016), 23rd Symposium on Formal Methods (2019, 2021), International Conference on Coordination Models and Languages (2019, 2020,2021,2022), International Conference on Formal Aspects of Component Software (2021,2023), International Conference on Formal Techniques for Distributed Objects, Components, and Systems (2022,2023), International Symposium on Real-time and Embedded Systems and Technology (2022)

● Editorial Assistant of CSI Journal on Computer Science and Engineering, (2007-2011)

● Publication chair of Iranian society of cyber-physical systems (2019-now)

Invited Talks

● Offline Automata Learning of Network Applications, Data Science and Machine Learning Summer school, Khatam University, 2019

● Behavioral Model Identification and Classification of Network Applications, Networks and Systems Summer School, Khatam University, 2018

● Towards verification and validation of IoT communicating protocols, Cybercity conference, Tehran University, 2017

Teaching:

● Fundamental Programming (under-graduate), Sharif University of Tech (Fall 2007).

● Design and Implementation of Compiler (under-graduate), Shahid Beheshti Uni.(Fall 2011), Tehran University (Spring 2006- now once each year): .

● System Analysis and Design (Software Eng. I- under-graduate), Tehran University (Spring 2012 - now, once each year).

● Process Algebra and Automata Theory (graduate), Tehran University (Spring 2012-now, once each year).

● Design of Programming Languages, Tehran University (Spring 2012 - now, once each year).

● Formal Verification of Reactive Systems (graduate), Tehran University (Fall 2012-now once each year)

References:

Prof. Dr. Marjan Sirjani, Malardalen University

Prof. Dr. Mohammad Reza Mousavi, King's College Landon

Prof. Dr. Wan Fokkink, Vrije Universiteit of Amsterdam

Prof. Dr. Ali Movaghar, Sharif Univeristy