Reza Safabakhsh

Professor

Computer Engineering Department
Amirkabir University of Technology (AUT)

Google Scholar:
https://scholar.google.com/citations?user=zFsdqo8AAAAJ&hl=en

Research Interests

Deep Learning, Reinforcement Learning, Computer Vision, Financial Engineering.

Teachings

Has taught the following courses over the past 30 years:

- Undergraduate: Logic Design, Technical Research and Presentation Methods.
- Graduate: Neural Networks, Computer Vision, Digital Image Processing, Advanced Artificial Intelligence, Fuzzy Methods and Systems, Neural Computing and Deep Learning, Graduate Seminar, Advanced Topics in Computer Vision, Advanced Topics in Neural Computing and Deep Learning, Advanced Topics in AI.

Research Supervision

- Has supervised many B.S. Final Projects in Computer engineering.
- Has supervised over 100 M.S. theses in Computer engineering (Artificial Intelligence).
- Has supervised more than 25 Ph.D. dissertations in Computer engineering (Artificial Intelligence).

Education

- Ph.D. in Electrical and Computer Engineering, The University of Tennessee, Knoxville, USA, 1986. Worked under supervision of Professor R. C. Gonzalez.
- M.S. in Electrical and Computer Engineering, The University of Tennessee, Knoxville, USA, 1980.
- B.S. in Electrical Engineering, Sharif University of Technology, Tehran, Iran, 1976.

Books

- *Research and Presentation in Engineering,* in Farsi, Amirkabir University Press, 2013, 2018.
- *Principles of Writing Scientific Technical Papers,* in Farsi, Amirkabir University Press, 2021.
- Book Chapters:

1. Asadi, A. and R. Safabakhsh, “The Encode-Decoder Framework and its Applications,” in *Deep Learning:*

Concepts and Architectures, W. Pedrycz &SM Chen, Ed., Springer, 2020, pp. 133-167.

2. Nickabadi, A., R. Safabakhsh and M.M. Ebadzadeh, "Inertia weight control strategies for PSO algorithms," in Swarm Intelligence: Principles, current algorithms and methods, Volume 1, *Y. Tan, Ed., IET, 2018, pp. 169-198.*

Faculty Member Positions

1988- 1998	❖ Assistant Prof., Computer Engineering Department, AUT.
1998-2003	❖ Associate Prof., Computer Engineering Department, AUT.
2003- Present	❖ Professor, Computer Engineering Department, AUT.

Administative Positions

2024- Present	❖ Project Manager, Intelligent Assistant for The Ministry of Roads and Urban Design.
2023- 2025	❖ Chairman, Computer Engineering Department, AUT.
2023- Present	❖ Associate Member, Electrical and Computer Engineering Group, Iranian Academy of Sciences.
2014-2023	❖ Invited Member, Electrical and Computer Engineering Group, Iranian Academy of Sciences.
2008-2013	❖ Member, Faculty Employment Steering Committee, AUT.
2005-2010	❖ Vice President for Research and Technology, AUT.
2003-2011	❖ Member, Scientific Journal Accreditation Board, Ministry of Sciences, Research and Technology.
2000- 2024	❖ Member, Faculty Promotion Board, AUT.
1998- 2024	❖ Member, Technical Committee, Faculty Promotion Board, AUT.
1996- 2024	❖ Member, Computer Engineering Committee, Program Planning Council, Minstry of Sciences, Research and Technology.
1993-1994	❖ Member, Founding Committee of the Computer Society of Iran.
1994-1998	❖ President of the Computer Society of Iran.
1992-1997	❖ Chairman, Computer Engineering Department, AUT.
1989-1992	❖ Deputy Chairman for Education, Computer Engineering Department, AUT.
1997-2002	❖ Deputy Chairman for Graduate Studies, Computer Engineering Department, AUT.
2002-2005	❖ Director of the Artificial Intelligence Group, Computer Engineering Department, AUT.

Journal Papers

Has published the following 81 Journal papers:

- Barati, R., R. Safabakhsh, M. Rahmati, "On Continuity of Robust and Accurate Classifiers," *IEEE Transactions on Neural Networks and Learning Systems,* pp.1-15, Nov. 2025.
- Asadi, A. and R. Safabakhsh, "Transformer-based actor-critic for adaptive cryptocurrency portfolio rebalancing," *Applied Soft Computing 185*, pp.1-13, Sep. 2025.
- Goldani, M.H., S. Momtazi, R. Safabakhsh, "Fighting Misinformation in Health News: DCNN-CapsNet for Cross-Domain Health Misinformation Detection," ACM Transactions on Intelligent Systems and Technology, 2025.
- Goldani, M.H., S. Momtazi, R. Safabakhsh, "Multilingual COVID-19 Fake News Detection with Hybrid Capsule Neural Networks," Journal of Artificial Intelligence and Data Mining, vol. 13, no. 4, pp. 427-440, 2025.
- Pourmohammadbagher, N., F. Ayar, A. Nickabadi, R. Safabakhsh, "Identity-preserving editing of multiple facial attributes by learning global edit directions and local adjustments," Computer Vision and Image Understanding, 246, 104047, 2024.
- Ziaeetabar, F., R. Safabakhsh, S. Momtazi, , "Multi sentence description of complex manipulation action videos," *Machine Vision and Applications,* vol. 35, no. 64, 2024.
- Shokri Asri, H. and R. Safabakhsh, "Advanced Visual and Textual Co-context Aware Attention Network with Dependent Multimodal Fusion Block for Visual Question Answering," *Multimedia Tools and Applications,* 40, pp. 87959-87986, 2024.
- Ghasemi Naraghi Z., A. Nickabadi, and R. Safabakhsh, "Towards Reliable Multi-Person Pose Estimation Using Conditional Random Fields," *Pattern Recognition Letters,* 175, pp. 59-65, 2023.
- Ghasemi Naraghi Z., A. Nickabadi, and R. Safabakhsh, "Multi-Task Learning Using Uncertainty for Realtime Multi-Person Pose Estimation," Journal of Electrical and Computer Engineering Innovations (JECEI), vol. 12, no. 1, pp. 147-162, 2023.
- Taghizadeh, S.and R. Safabakhsh, "An Integrated INS/GNSS system with an attention-based hierarchical LSTM during GNSS outage, *GPS Solutions,* vol. 27, no. 2, 2023.
- Taghizadeh, S.and R. Safabakhsh, "Low-cost integrated INS/GNSS using adaptive H∞ Cubature Kalman Filter," Journal of Navigation, 76, pp. 1-19, 2023.
- Taghian Jazi, M., A. Asadi, and R. Safabakhsh, "A Reinforcement Learning-based Encoder-Decoder Framework for Learning Stock Trading Rules," *Journal of Artificial Intelligence and Data Mining,* vol. 11, no. 1, pp. 103-118, 2023.
- Taghian Jazi, M., A. Asadi, and R. Safabakhsh, "Learning financial asset-specific trading rules via deep reinforcement learning," *Expert Systems with Applications,* 195, 116523, 2022.
- Taghizadeh, S.and R. Safabakhsh, "A low-cost integrated navigation system based on factor graph nonlinear optimization for autonomous fight," *GPS Solutions,* vol. 26, no. 3, 2022.
- Ghasemi Naraghi Z., A. Nickabadi, and R. Safabakhsh, "LogSE: An Uncertainty-Based Multi-Task Loss Function for Learning Two Regression Tasks," Journal of Universal Computer Science, vol. 28, no. 2, pp.

141-159, 2022.

- Talebi M. et al. “Forest road planning to improve tourism accessibility: a comparison of different methods applied in a real case study,” *Geocarto International*, vol. 37, no. 25, 2022.

- Abdi A. and R. Safabakhsh, “An Automatic Graphic Pattern Generation Algorithm and its Application to the Multipurpose Camouflage Pattern Design,” *IEEE Transactions on Cybernetics,* vol. 53, pp. 4748-4762, 2022.

- Malek, H., M.M. Ebadzadeh, R. Safabakhsh and A. Razavi, “Mathematical analysis of the role of pituitary-adrenal interactions in ultradian rhythms of the HPA axis,” *Computers in Biology and Medicine*, v. 135, 2021.

- Pourfard, M., T. Hosseinian, R. Saeidi, S. A. Motamedi, M. J. Abdollahifard, R. Mansoori, R. Safabakhsh, “KAZE-SAR: SAR Image Registration Using KAZE Detector and Modified SURF Descriptor for Tackling Speckle Noise,” *IEEE Transactions on Geoscience and Remote Sensing,* vol. 60, Art no. 5207612, pp. 1-12, 2021.

- Goldani, M.H., S. Momtazi, and R. Safabakhsh, “Detecting fake news with capsule neural networks,” *Applied Soft Computing,* v. 101, 106991, 2021.

- Mohammadreza, E., and R. Safabakhsh, “Lecture quality assessment based on the audience reactions using machine learning and neural networks,” *Computers and Education: Artificial Intelligence*, v. 2, 100022, pp.1-10, 2021.

- Sohrabi Nasrabadi, M. and R. Safabakhsh, “3D object recognition with a linear time-varying system of overlay layers,” *IET Computer Vision*, vol. 15, no. 5, pp. 380-391, 2021.

- Goldani, M.H., R. Safabakhsh, and S. Momtazi, “Convolutional neural network with margin loss for fake news detection,” *Information Processing & Management*, v.58, no. 1, 102418, 2021.

- Majd, M. and R. Safabakhsh “Correlational convolutional LSTM for human action recognition,” *Neurocomputing*, v. 396, pp. 224-229, 2020.

- Ghanbarian, A., G. Ghiasi, R. Safabakhsh, N. Arastouie, “Writer identification with *n*-tuple direction feature from contour,” *IET Image Processing*, v. 14, no. 6, 1101-1109, 2020.

- Bakhshaei, S., R. Safabakhsh, and S. Khadivi, “Matching Graph, a Method for Extracting Parallel Information from Comparable Corpora,” *ACM Transactions on Asian and Low-Resource Language Information Processing (TALLIP),* v. 19, no. 1, pp. 1-29, 2019.

- Fakhredanesh, M. M. Rahmati, and R. Safabakhsh, “Steganography in discrete wavelet transform based on human visual system and cover model,” *Multimedia Tools and Applications*, v. 78, no. 13, pp. 18475-18502, 2019.

- Jalali Moghaddam M., M. Hosseini, and R. Safabakhsh, “Fuzzy Q-learning traffic light control based on traffic flow and pedestrian number estimated from visual information,” *Computer and Knowledge Engineering,* v. 2, no. 1, pp. 1-10, 2019.

- Majd, M. and R. Safabakhsh, “A motion-aware ConvLSTM network for action recognition,” *Applied Intelligence*, v. 49, no. 7, pp. 2515-2521, 2019.

- Shojaedini, E., M. Majd and R. Safabakhsh, “Novel adaptive genetic algorithm sample consensus,” *Applied Soft Computing* 77, 635-642, 2019.

- Bakhshaei, S., R. Safabakhsh, and S. Khadivi, "Extracting parallel fragments from comparable documents using a generative model," *Computer Speech & Language* 53, 25-42, 2019.

- Torkaman, A. and R. Safabakhsh, "Robust Opponent Modeling in Real-Time Strategy Games using Bayesian Networks," *Journal of AI and Data Mining* 7 (1), 149-159, 2019.

- Kaashki, N. and R. Safabakhsh, "RGB-D face recognition under various conditions via 3D constrained local model," *Journal of Visual Communication and Image Representation* 52, 66-8, 2018.

- PourMohammadBagher, L., M.M. Ebadzadeh, and R. Safabakhsh, "Graphical model based continuous estimation of distribution algorithm," *Applied Soft Computing* 58, 388-400, 2017.

- Jafari, A., M.M. Ebadzadeh, and R. Safabakhsh, "Independent base vector representation to address endmember variability in hyperspectral unmixing," *Journal of the Indian Society of Remote Sensing* 45 (3), 417-42, 2017.

- Jafari, A., R. Safabakhsh, and M.M. Ebadzadeh, "Endmember orthonormal mapping in hyperspectral mixture analysis to address endmember variability," *Earth Science Informatics* 9 (3), 291-307, 2016.

- Kamkar, S. and R. Safabakhsh, "Vehicle detection, counting and classification in various conditions," *IET Intelligent Transport Systems* 10 (6), 406-413, 2016.

- Parsa, P. and R. Safabakhsh, "A New Method for Image Segmentation based on Multi-Objective Differential Evolution Fuzzy Clustering," *Journal of Iranian Association of Electrical and Electronics Engineers* 13 (2), 2016.

- Taherkhani, M., and R. Safabakhsh, "A novel stability-based adaptive inertia weight for particle swarm optimization," *Applied Soft Computing* 38, 281-295, 2016.

- Malek, H., M.M. Ebadzadeh, R. Safabakhsh, A. Razavi, and J. Zaringhalam, "Dynamics of the HPA axis and inflammatory cytokines: Insights from mathematical modeling," *Computers in Biology and Medicine* 67, 1-12, 2015.

- Varposhti, M., M. Dehghan, and R. Safabakhsh, "A Distributed homological approach to location-independent area coverage in wireless sensor networks," *Wireless personal communications* 83 (4), 3075-3089, 2015.

- Bakhshaei, S., R. Safabakhsh, and S. Khadivi, "Density-Based K-Nearest Neighbor Active Learning for Improving Farsi-English Statistical Machine Translation System," *International Journal of Information and Communication Technology Research* 7, 2015.

- Qazanfari, K. and R. Safabakhsh, "A new steganography method which preserves histogram: Generalization of LSB++," *Information Sciences*, vol. 277, pp. 90-101, 2014.

- Fakhredanesh, M., R. Safabakhsh, and M. Rahmati, "A Model-Based Image Steganography Method Using Watson's Visual Model," *ETRI Journal*, vol. 36, no. 3, pp. 479-489, June 2014.

- Iranpour, M. and R. Safabakhsh, "Reducing the embedding impact in steganography using Hamiltonian paths and writing on wet paper," *Multimedia Tools and Applications*, vol. 69, no. 1, March 2014.

- Fakhredanesh, M., M. Rahmati, and R. Safabakhsh, "Adaptive Image Steganography using Contourlet Transform," *J. of Electronic Imaging*, 22(4), 043007 (Oct–Dec 2013).

- Qazanfari, K. and R. Safabakhsh, "High capacity method for hiding data in the discrete cosine transform domain," *J. of Electronic Imaging*, 22(4), 043009 (Oct–Dec 2013)

- Ghiasi G. and Safabakhsh R., "Offline Text-Independent Writer Identification Using Codebook and Efficient Code Extraction Methods," *Image and Vision Computing*, vol. 31, no. 5, pp. 379-391, 2013.

- Karami, M., Safabakhsh, R. and Rahmati, M., "Modular Cellular Neural Network Structure for Wave-Computing-Based Image Processing," *ETRI Journal*, vol. 35, no. 2, April 2013.

- Karami, M., M. Rahmati, and R. Safabakhsh, "A diffusion Based Wave Computing Algorithm for Real Time Edge detection," *International Journal of Circuites Systems and Signal Processing,* vol. 6, no. 2, pp. 131-142, 2012.

- Nickabadi, A., M.M. Ebadzadeh, and R. Safabakhsh, "A competitive clustering particle swarm optimizer for dynamic optimization problems," *Swarm Intelligence,* (2012) 6:177–206

- Ghazanfari, K and R. Safabakhsh, "Adaptive method for hiding data in images," *Journal of Electronic Imaging* 21(1), 013022 (Jan–Mar 2012).

- Sadeghi, F., H. Izadinia, and R. Safabakhsh, "A new active contour model based on the Conscience, Archiving and Mean-Movement mechanisms and the SOM," *Pattern Recognition Letters,* 2011. **32**(12): p. 1622-1634.

- Montazeri, H., S. Moradi, and R. Safabakhsh, "Continuous state/action reinforcement learning: A growing self-organizing map approach," *Neurocomputing,* 2011. **74**(7): p. 1069-1082.

- Nickabadi, A., M.M. Ebadzadeh, and R. Safabakhsh, *A novel particle swarm optimization algorithm with adaptive inertia weight. Applied Soft Computing*, 2011. **11**(4): p. 3658-3670.

- Safabakhsh, R. and F. Tafazzoli, "Model-based human gait recognition using leg and arm movements," *Engineering Applications of Artificial Intelligence,* 2010. **23**(8): p. 1246-73.

- Ghiasi-Shirazi, K., R. Safabakhsh, and M. Shamsi, *Learning Translation Invariant Kernels for Classification. Journal of Machine Learning Research,* 2010. **11**: p. 1353-1390.

- Izadi, M. and R. Safabakhsh, *An improved time-adaptive self-organizing map for high-speed shape modeling,* Pattern Recognition, 2009. **42**(7,S.): p. 1361-1370.

- Mirzaei, A. and R. Safabakhsh, *Optimal matching by the transiently chaotic neural network.* Applied Soft Computing, 2009. **9**(3): p. 863-873.

- Adibi, P. and R. Safabakhsh, *Information Maximization in a Linear Manifold Topographic Map.* Neural Processing Letters, 2009. **29**(3): p. 155-178.

- Ghiasi Shirazi, S.K. and R. Safabakhsh, *Omnidirectional edge detection.* Computer Vision and Image Understanding, 2009. **113**(4): p. 556-564.

- Adibi, P. and R. Safabakhsh, *Linear manifold topographic map formation based on an energy function with on-line adaptation rules.* Neurocomputing, 2009. **72**(7-9): p. 1817-1825.

- Bafghi, A.G., R. Safabakhsh, and B. Sadeghiyan, "*Finding the differential characteristics of block ciphers with neural networks.* Information Sciences, 2008. **178**(15): p. 3118-3132.

- Khosravi, M.H. and R. Safabakhsh, *Human eye sclera detection and tracking using a modified time-adaptive self-organizing map.* Pattern Recognition, 2008. **41**(8): p. 2571-2593.

- شاهمیری، امیرشهاب، صفابخش، رضا و دژکام، رسول، **"تصحیح خودکار غلط‌های تایپی فارسی به‌کمک شبکهٔ عصبی مصنوعی ترکیبی،" مجله مهندسین برق و الکترونیک ایران، ۱۳۸۷**

- Mirzaei A., Zaboli H., and Safabakhsh R., "A Neural Network String Matcher," LNCS: Computer Analysis of Images and Patterns, pp. 784-791, Springer, 2007.

- قائمی بافقی، عباس، صادقیان،بابک و صفابخش، رضا، "تعیین مشخصه تفاضلی در الگوریتم‌های رمز قطعه‌ای با شبکه هاپفیلد و ماشین بوتزمن،" مجله علمی پژوهشی مدرس، شماره ۲۲، زمستان ۱۳۸۴، ص ۴۹-۶۷، ۱۳۸۴.

- P. Adibi, and R. Safabakhsh, "Nastaaligh Hand written Word Recognition Using A Continuous_ Density Variable_ Duration HMM," Arabian journal for science and engineering, 2005.

- P. Adibi, M.R. Meybodi, and R. Safabakhsh, "Unsupervised Learning of Synaptic Delays based on Learning Automata hn an RBF-like Network of Spiking Neurons for Data Clustering," *Neurocomputing* 64, pp. 337-357, 2005.

- تهرانی زاده، محسن، صفابخش، رضا، و آقابراتی، حسن، "کاربرد شبکه های عصبی در تعیین پارامتر و تشخیص خسارت،" نشریه بنا، شماره شانزدهم و هفدهم، ص ۱۵۰-۱۶۴، آذرماه ۱۳۸۲.

- حقیقت، پیمان، و صفابخش، رضا، "ردگیری اشیاء در دنباله تصاویر" علوم و مهندسی کامپیوتر، مجلد ۱، شماره ۳ (الف)، ص ۴۳-۶۸، پائیز ۱۳۸۲.

- صفابخش، رضا و ادیبی، پیمان، "شناسائی کلمات دستنویس نستعلیق فارسی با استفاده از تقطیع مبتنی بر کانتور بالائی کلمات و مدل پنهانی مارکف،" نشریه علمی پژوهشی امیرکبیر، تابستان ۱۳۸۲.

- Shah-Hosseini H. and Safabakhsh R., "A TASOM-based Algorithm for Active Contour Modeling," *Pattern Recognition Letters*, vol. 24, no. 9, 2003.

- Shah-Hosseini H. and Safabakhsh R., "TASOM: A New Time Adaptive Self-Organizing Map," *IEEE Trans. SMC-B*, vol. 33, no. 2, 2003.

- Shah-Hosseini H. and Safabakhsh R., "Automatic Multilevel Thresholding for Image Segmentation by the Growing Time Adaptive Self-Organizing Map*," IEEE Trans. PAMI*, vol. 24, no. 10, 2002.

- Shah-Hosseini H. and Safabakhsh R., "Automatic Adjustment of Learning Rates of the Self-Organizing Feature Map," *Scientia Iranica*, vol. 8, no. 4, pp. 277-286, 2001.

- Shah-Hosseini H. and Safabakhsh R., "The Time Adaptive Self-Organizing Map for Distribution Estimation," *International Journal of Engineering*, vol. 15, no. 1, pp. 23-34, 2001.

- صفابخش، رضا و عبادزاده، محمدمهدی، "اتوماسیون آنالیز سفالومتری جهت تشخیص ناهنجاری های اسکلتی- صورتی،" امیرکبیر، سال دهم، شماره ۴۰، ص ۳۱-۳۲۶، ۱۳۷۸.

- صفابخش، رضا و دست پاک، وحدت، "جداسازی و شناسائی حروف تایپی فارسی با استفاده از گشتاورهای مقیاس شده و روش جستجوی ستون به ستون،" امیرکبیر، سال هشتم، شماره ۲۸، ۱۳۷۴.

- Gonzalez R. C. and Safabakhsh, R., "Computer Vision Techniques for Industrial Applications and Robot Control, " IEEE Computer, vol. 15, no. 12, pp. 17-32, 1982.

- Gonzalez R. C. and Safabakhsh, R., "Computer Vision Techniques for Industrial Inspection and Robot Control: A Tutorial, " IEEE Tutorial on Robotics (2 Widely distributed editions), pp. 400-424, 1986, 1982.

Conference Papers

Has published over 200 conference papers.