

S. Mohammad Mostafavi I. – Applied AI Research Scientist (Senior)

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Interests

- Computational Pathology (Cell Detection, Tissue Segmentation, Sub-cell Models).
- Event-based (Neuromorphic) Cameras/Vision (Reconstruction, Super-resolution, Depth/Flow estimation).
- Super-resolution (RNNs for Event-cameras, weighted patches for Facial images).
- Generative Models (Diffusion-based, Bridging, CTMs, and GANs).

Education

- Gwangju Institute of Science and Technology (GIST) – 2015 ~ 2021 – South Korea, Gwangju.
 - Ph.D. in electrical engineering and computer science (Presidential Excellence Award).
 - Doctoral Dissertation: **Event-based vision**: Image reconstruction, Super-resolution, Depth estimation.
 - Advisors: [Prof. Jonghyun Choi \(GIST\)](#), and [Prof. Kuk-Jin Yoon \(KAIST\)](#).
- Hakim Sabzevari University – 2009 ~ 2011 – Iran, Sabzevar.
 - M.Sc. in Electrical Engineering and Electronics.
 - Thesis: Facial Image Super-Resolution Using Weighted Patch Pairs.
 - Advisors: [Prof. Javad Haddadnia](#) (Hakim Sabzevari Uni.), and [Prof. Payman Moallem](#) (Uni. of Esfahan).

Selected Experiences

- [Lunit Inc.](#) – **Research Scientist (Senior)** (Jun. 2021 – Mar. 2024) and **Team Leader** (Mar. 2023 – Mar. 2024).
 - Oncology Model-Centric AI Research – Led a team of 3~4 members.
 - Performance improvement for the main products (SCOPE) and pharma-requested models/bakeoffs.
 - Deep-learning-based cell detection and tissue segmentation models for SCOPE ([IO](#), [PD-L1](#)), and UIHC.
 - Taskforce leading in 4 out of 8 model development periods.
 - Establishing, persuading, and developing further product-oriented research directions.
 - Universal IHC models [[A1](#), [J5](#)], Sub-cellular models [[P1](#)], WSI synthesis, and End-point mutations.
 - Sharing recent CV/ML trends through study groups and weekly research seminars.
 - Publishing the findings, practices, and resources in Computational Pathology and PathOmics.
 - Abstracts [[A1](#)~[A4](#)], Journals [[J3](#), [J4](#)], Patents [[P1](#)], and Challenges [[S4](#)].
 - Collaborating across pathology, biomedical engineering, product engineering, and business development.
- [GIST](#) – **Research Assistant and Ph.D. student** (Sep. 2015 – Jun. 2021).
 - Proposing novel deep-learning approaches on the event-based vision for image reconstruction [[J1](#), [C3](#)], super-resolution [[J2](#), [C4](#)], and depth estimation [[C1](#), [C2](#)].
 - Publishing in top-tier journals (TPAMI/IJCV [[J1](#), [J2](#)]), conferences (CVPR/IJCV [[C1](#)~[C4](#)] – **1 oral CVPR** [[C3](#)]), and registered a Patent [[P2](#)].
 - Mentoring a master's student, from teaching basic concepts to publishing in a CVPR paper [[C1](#)].
 - Reaching **Rank #1** in the [CVPRW Event-based Vision](#) Competition (2021).
 - Contributing to the research community by releasing 2 code repos on GitHub from papers:
 - <https://github.com/gistvision/e2sri> ★ 50 [[C3](#)] (as of Dec 2024).
 - <https://github.com/yonseivnl/se-cff> ★ 39 [[C1](#)] (as of Dec 2024).
- **Others**
 - **PostDoc** – Medical University of Isfahan, Medical Image and Signal Processing Center (Jun. 2024– Ongoing).
 - **Researcher** – Seoul National University – Machine Perception and Reasoning lab. (Mar. 2024– Ongoing).
 - Mentoring two MSc. candidates on Event Cameras and Continuous Trajectory Models.

- Research paper contribution (under review NeurIPS'24).
- **Instrumentation supervisor** - Esfahan Petrochemical Company (Spring 2013 - Fall 2015).
- **Researcher** - Isfahan University of Technology (Fall 2012 - Spring 2013), Subsea R&D center.
- **Instructor** - Islamic Azad University, Mobarakeh Branch (2011 and 2013).

Selected Publications - * indicates equal contribution across the marked authors | Full list at my [Google Scholar](#) [NNvELCcAAAAJ](#) - No. of citations: 514 and h-index: 8 as of Dec 2024. | [ORCID 0000-0002-5883-3844](#) | [Scopus 40461500600](#)

Conferences *on Computer Vision / Machine Learning*

- [C1] [“Stereo Depth from Event Cameras: Concentrate and Focus on the Future”](#) - Y Nam*, **M Mostafavi***, KJ Yoon, JH Choi - *equal contribution - CVF/IEEE - **CVPR 2022** (25.33% accept. rate) [[Code](#)]
- [C2] [“Event-Intensity Stereo: Estimating Depth by the Best of Both Worlds”](#) - **M Mostafavi**, KJ Yoon, J Choi - CVF/IEEE - **ICCV 2021** (25.9% accept. rate)
- [C3] 🏆 [“Learning to Super Resolve Intensity Images from Events”](#) - **M Mostafavi**, J Choi, KJ Yoon - CVF/IEEE - **CVPR 2020** (5% accept. rate) [[Oral](#)][[Code](#)]
- [C4] [“Event-based high dynamic range image and very high frame rate video generation using conditional generative adversarial networks”](#) - L Wang*, **M Mostafavi***, YS Ho, and KJ Yoon - *equal contribution CVF/IEEE - **CVPR 2019** (25.2% accept. rate)

Journals *on Computer Vision / Machine Learning*

- [J1] 🏆 [“E2SRI: Learning to Super-Resolve Intensity Images from Events”](#) - **M Mostafavi**, Y Nam, J Choi, KJ Yoon - IEEE-Transactions on Pattern Analysis and Machine Intelligence - **TPAMI 2021** (IF 24.31)
- [J2] [“Learning to reconstruct HDR images from events, with applications to depth and flow”](#) - **M Mostafavi**, L Wang, KJ Yoon - Springer- International Journal of Computer Vision - **IJCV 2021** (IF 11.54)

Journals *on AI-assisted oncology and Computational Pathology*

- [J3] [“Artificial intelligence-powered spatial analysis of tumor-infiltrating lymphocytes as a predictive biomarker for axitinib in adenoid cystic carcinoma”](#) - DH Kim, Y Lim, C-Y Ock, G Park, S Park, H Song, M Ma, **M Mostafavi**, EJ Kang, M-J Ahn, K-W Lee, JH Kwon, Y Yang, YH Choi, MK Kim, JH Ji, T Yun, S-B Kim, B Keam - **Head & Neck 2023** (IF 2.9)
- [J4] [“Artificial intelligence-powered whole-slide image analyzer reveals a distinctive distribution of tumor-infiltrating lymphocytes in neuroendocrine neoplasms”](#) - HG Cho, SI Cho, S Choi, W Jung, J Shin, G Park, J Moon, M Ma, H Song, **M Mostafavi**, M Kang, S Pereira, K Paeng, D Yoo, CY Ock, S Kim - **MDPI Diagnostics 2022** (IF 3.99)
- [J5] [“A universal immunohistochemistry analyzer for generalizing AI-driven assessment of immunohistochemistry across immunostains and cancer types”](#) - B Brattoli*, **M Mostafavi***, T Lee*, W Jung, J Ryu, S Park, J Park, S Pereira, S Shin, S Choi, H Kim, D Yoo, SM Ali, K Paeng, CY Ock, SI Cho, S Kim - **npj precision oncology 2024** (IF 6.8)

Abstracts *on AI-assisted oncology and Computational Pathology*

- [A1] 🏆 [“Universal immunohistochemistry positivity classification of cancer cells across multiple cancer types and antibodies using artificial intelligence”](#) - B Brattoli*, **M Mostafavi***, S Choi, T Lee, S Kim, W Jung, SI Cho, J Lee, K Chung, J Ryu, S Park, S Pereira, S Shin, CY Ock - **AACR Annual Meeting Abstracts 2023**
- [A2] [“1293 Fragmented pattern of tumor mass is related to fibroblast activation mitigating spatial interaction between tumor and immune cells”](#) - S Kim, S Song, S Kim, M Kang, **M Mostafavi**, D Yoo, CH Ahn, S Ali, C-Y Ock - **SITC Meeting Abstracts 2023**
- [A3] [“123P Artificial intelligence \(AI\)-powered analysis of human epidermal growth factor receptor-2 \(HER2\) and tumor-infiltrating lymphocytes \(TILs\) in advanced biliary tract cancer \(BTC\)”](#) - G Kim, C Kim, B Kang, S Shin, T Lee, S Song, S Kim, **M Mostafavi**, H Song, S Pereira, H Chon - **ESMO Congress Abstracts 2023**
- [A4] [“Performance validation of an artificial intelligence-powered PD-L1 combined positive score analyzer in six](#)

cancer types” - T Lee, SI Cho, S Choi, S Kim, W Jung, D Lee, S Lee, **M Mostafavi**, S Park, J Lee, J Shin, S Kim, K Paeng, CY Ock- ASCO Annual Meeting Abstracts 2023

Patents

- [P1] A method and apparatus for analyzing IHC stained images using an AI model - 2024 - B Brattoli, **M Mostafavi**, Y Lee, CH Ahn, T Lee, and J Ryu. Korean Patent {AI 모델을 이용한 IHC 염색 슬라이드 이미지 분석 방법 및 장치}.
- [P2] A method and apparatus for generating super resolve intensity image - 2020 - J Choi, **SM Mostafavi I**, and KJ Yoon. [Korean Patent \(102366187\)](#) {고해상도 강도 이미지 생성 방법 및 장치}.

Honors and Awards

- 🏆 Presidential Excellence Award - Best Ph.D. Dissertation - GIST (2021).
- 🏆 Rank #1 CVPRW Event-based vision competition for depth estimation from event cameras (2021).
- Outstanding RA Award - GIST (2020).
- Doctoral Consortiums: IEEE CVPR (2020 - USA, Virtual) and KCCV (2020 - Korea).
- Best paper awards: KSC (2019 - Korea), IPIU Bronze (2019 - Korea).
- Scholarships: Korean Gov. (2015-2019), Global Uni. Project (2015), Iranian Gov. Scholarship (2009-2011).

Languages

- English: Bilingual fluency, Farsi: Native, Korean: Low-Intermediate.

Programming Skills and Tools

- Programming Languages: Python, MATLAB, C++, Bash. ■ Libs. : PyTorch, OpenCV, TensorFlow, Keras.
- Tools: GNU Linux, Google GCP, Docker, ROS, Git, Meshlab, LaTeX, Confluence, Jira, Notion.

Services

- [S1] Reviewer - MICCAI'24 workshops: [COMPAYL](#), [CaPTion](#), [MOVI](#), and [MLMI](#).
- [S2] Challenge organizer - [Advances in Neuromorphic Vision](#) - ICME 2024 [In progress].
- [S3] Volume Editor - MICCAI 2023 satellite events proceedings - Springer LNCS 2024 [In progress].
- [S4] Challenge organizer - [OCELOT 2023: Cell Detection from Cell-Tissue Interaction](#) - MICCAI 2023.
- [S5] Reviewer of CVPR, ECCV, ICCV | MICCAI | Springer: IJCV | IEEE: TIM, TCI | IET: IP.
- [S6] First [Manager of IEEE Young Prof. Affinity Group](#) in Gwangju Korea (2016).

Management Skills

- Performance management, One-on-one meetings, Roadmaps / OKRs (Objective, Key Results) management.
- Lunit research interview committee (Sep 2021 - Feb 2024) - 80+ screening and 20+ live technical interviews.

Teaching

- Course Designer and Lecturer - MUI (Fall 2024 ~ Contd.) Special series on AI for medical practitioners (Pathology, Dentistry, Cardiology, Pharmacy, Ophthalmology)
- Teaching Assistant - GIST- Korea (Spring 2020) Visual Recognition and Reasoning.
- Teaching Assistant - GIST- Korea (Spring 2017) Digital Signal Processing.
- Lecturer - Islamic Azad University - Mobarakeh - Iran (Fall 2011 ~ Spring 2013) Electronic circuits, and 6 labs.

References

Available on request.