





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

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## Interests

- **Generative Models** (Diffusion-based, Bridging, CTMs, and GANs).
- **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).

## 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], 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 [S3].
  - 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 May 2024).
    - <https://github.com/yonseivnl/se-cff> ★ 37 [C1] (as of May 2024).

## ■ Others

- **Researcher** – Seoul National University – Machine Perception and Reasoning lab. (Mar. – May 2024).
  - 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: 441 and h-index: 8 as of May 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)

## *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)

## 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 Congres 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] Challenge organizer – [Advances in Neuromorphic Vision](#) – ICME 2024 [In progress].
- [S2] Volume Editor – MICCAI 2023 satellite events proceedings – Springer LNCS 2024 [In progress].
- [S3] Challenge organizer – [OCELOT 2023: Cell Detection from Cell-Tissue Interaction](#) – MICCAI 2023.
- [S4] Reviewer of IEEE: CVPR, ECCV, ICCV | MICCAI | IEEE TIM, TCI | IET IP | Iranian J. of Medical Physics.
- [S5] First [Manager of IEEE Young Prof. Affinity Group](#) in Gwangju Korea (2016).

## Management Skills

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

## Teaching

- 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.