

Md Maklachur Rahman

Final Year PhD Student in Computer Science
Texas A&M University, College Station, TX, USA
U.S. Permanent Resident

maklachur@tamu.edu
maklachur@gmail.com
[Google Scholar](#) | [LinkedIn](#) | [GitHub](#) | [Portfolio](#)

EDUCATION

Texas A&M University (TAMU)

PhD in Computer Science | *Expected Spring 2027*
CGPA: 4.0/4.0

College Station, TX, USA

Jan 2022–Present

Kyungpook National University (KNU)

MS in Computer Science & Engineering
Outstanding MS Thesis Award - 2020

Daegu, South Korea

Sep 2018–Aug 2020

SELECTED PUBLICATIONS

1. **Md Maklachur Rahman**, Soon Ki Jung, and Tracy Hammond. “MambaLiteUNet: Cross-Gated Adaptive Feature Fusion for Robust Skin Lesion Segmentation.” In *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2026)*.
2. **Md Maklachur Rahman** and Tracy Hammond. “Dual-Domain Cross-Modal Decoding for Clinical Text-Guided Medical Image Segmentation.” Accepted at the *29th International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI 2026)*.
3. **Md Maklachur Rahman**, Md Hasan Al Banna, and Tracy Hammond. “GET: Generative Embedding Translation for Medical Image Segmentation.” Accepted at the *BioImage Computing (BIC) Workshop at the 19th European Conference on Computer Vision (ECCV 2026)*.
4. **Md Maklachur Rahman**, Md Hasan Al Banna, Saraf Anjum, Assame Arnob, and Tracy Hammond. “Multimodal Routing and Region Refinement for Language-Guided Medical Image Segmentation.” Accepted at *TIA @29th International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI 2026)*.
5. Md Hasan Al Banna, **Md Maklachur Rahman**, and Tracy Hammond. “Too Tight or Too Loose: How VLM Persona Committees Miscalibrate Inter-Rater Ambiguity in Medical Image Segmentation.” Accepted for **Oral Presentation** at *AgenticMed @29th International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI 2026)*.
6. **Md Maklachur Rahman**, Soon Ki Jung, and Tracy Hammond. “AULUNet: An Adaptive Ultra-Lightweight U-Net Framework for Efficient Skin Lesion Segmentation in Resource-Constrained Environments.” In *The 36th British Machine Vision Conference (BMVC 2025)*, **Oral**, Top 3%.
7. Meet Arvindbhai Monpara, **Md Maklachur Rahman**, Tauhidul Alam, Jiangjiang Liu, and Jing Zhang. “Stranded Human Detection in Flooded Environments From UAV Imagery.” In *2025 International Conference on Robotic Computing and Communication (RoboticCC 2025)*.
8. **Md Maklachur Rahman**, Abdullah Aman Tutul, Ankur Nath, Lamyamba Laishram, Soon Ki Jung, and Tracy Hammond. “Mamba in Vision: A Comprehensive Survey of Techniques and Applications.” arXiv preprint, 2024.
9. Deblina Mazumder Setu, Tania Islam, **Md Maklachur Rahman**, and Samrat Kumar Dey. “Towards Enhancing Healthcare Data Privacy: Integrating BioClinicalBERT With Polyalphabetic Cipher for Entity Recognition and Anonymization.” *Engineering Reports*, 8(3), 2026.
10. **Md Maklachur Rahman**. “Target Focused Shallow Transformer Framework for Efficient Visual Tracking.” In *Doctoral Consortium of the 38th AAAI Conference on Artificial Intelligence (AAAI 2024)*, Vancouver, Canada.
11. **Md Maklachur Rahman** and Tracy Hammond. “Learning Random Noise Salient Feature Fusion Siamese Network for Low-Resolution Object Tracking.” In *Student Abstract and Poster Program of the 38th AAAI Conference on Artificial Intelligence (AAAI 2024)*, Vancouver, Canada.

12. **Md Maklachur Rahman** and Soon Ki Jung. “Siamese-Based Attention Learning Networks for Robust Visual Object Tracking.” In *Visual Object Tracking in Challenging Situations*. IntechOpen, 2022. [Book Chapter]
13. **Md Maklachur Rahman**, Md Rishad Ahmed, Lamyamba Laishram, Seock Ho Kim, and Soon Ki Jung. “Siamese High-Level Feature Refine Network for Visual Object Tracking.” *Electronics*, 2020.
14. **Md Maklachur Rahman**, Mustansar Fiaz, and Soon Ki Jung. “Efficient Visual Tracking with Stacked Channel-Spatial Attention Learning.” *IEEE Access*, 2020.
15. Mustansar Fiaz, **Md Maklachur Rahman**, Arif Mahmood, Sehar Shahzad Farooq, Ki Yeol Baek, and Soon Ki Jung. “Adaptive Feature Selection Siamese Networks for Visual Tracking.” In *26th International Workshop on Frontiers of Computer Vision (IW-FCV 2020)*, Ibusuki, Japan. **Oral. [Best Student Paper Award]**

Full publication list: [Google Scholar](#)

MANUSCRIPTS UNDER REVIEW

1. **Md Maklachur Rahman**, Soon Ki Jung, and Tracy Hammond. “An Ultra-Lightweight U-Net for Skin Lesion Segmentation under Dataset Shift with Inference Scaling.” Under review at *International Journal of Computer Vision (IJCV)*.

RESEARCH AND PROFESSIONAL EXPERIENCE

Sketch Recognition Lab, Texas A&M University
Graduate Research Assistant / PhD Student

College Station, TX, USA
Jan 2022–Present

- Conduct research in medical image segmentation, computer vision, efficient and lightweight AI, and multimodal learning, with current work spanning text-guided, generative, and skin lesion segmentation.
- Develop compact segmentation frameworks for robust medical image analysis under dataset shift and limited-compute settings, leading to publications in CVPR 2026 and BMVC 2025, with ongoing work in clinical text-guided and generative segmentation.
- Mentor BS, MS, and junior PhD students on several research projects, including medical imaging, segmentation, and computer vision.

Center for Embedded Software Technology, Kyungpook National University
Researcher

Daegu, South Korea
Sep 2021–Dec 2021

- Developed an edge-oriented traffic perception pipeline for vehicle and pedestrian detection, tracking, and counting from intersection-camera imagery.
- Estimated position and velocity for two target classes across roadway, sidewalk, and crosswalk regions to support practical traffic-monitoring applications.

Visual AI Lab, Kyungpook National University
Research Assistant
Researcher

Daegu, South Korea
Sep 2018–Aug 2020
Sep 2020–Aug 2021

- Developed Siamese, attention, and sequence-modeling-based frameworks for robust visual object tracking under different challenges, such as occlusion, appearance variation, deformation, scaling, and background clutter.
- Contributed to tracking systems published in IEEE Access, Electronics, and IW-FCV, with emphasis on target discrimination and real-time-friendly inference.

Samsung Research Bangladesh, Samsung Electronics
Software Engineer

Dhaka, Bangladesh
Oct 2013–Jul 2016

- Worked on software validation, verification, and automation in an industrial R&D environment.
- Contributed to Tizen IDE verification and IoT/SWC/DMC test framework development to improve repeatability, reliability, and efficiency in system-level quality assurance.

TEACHING EXPERIENCE

Texas A&M University

Graduate Teaching Assistant | Programming Languages (CSCE 314)

College Station, TX, USA

Jan 2024–Present

- Supported instruction in Haskell and Java for an upper-level programming languages course.
- Designed and managed grading workflows and score distributions for quizzes, assignments, and exams.
- Held office hours and guided students on course concepts, debugging, and programming assignments.

HONORS AND AWARDS

- CVPR Broadening Participation Award, CVPR 2026 Apr 2026
- Outstanding Reviewer, BMVC 2025 Nov 2025
- TAMU CS Department Travel Grant Nov 2025; June 2026
- IEFS Graduate Scholarship, TAMU Aug 2025
- AAAI 2024 Travel Award Feb 2024
- Outstanding MS Thesis Award, KNU Aug 2020
- Best Student Paper Award, IW-FCV 2020 Feb 2020
- Brain Korea 21 Plus (BK21) Scholarship Sep 2018 – Aug 2020
- KNU International Graduate Scholarship (Full KINGS) Sep 2018 – Aug 2020
- University Merit Scholarship, CUET Mar 2009 – Sep 2013

PROFESSIONAL SERVICE

- **Conference Reviewer:** NeurIPS, CVPR, ECCV, AAAI, WACV, BMVC, Graphics Interface
- **Journal Reviewer:** Pattern Recognition, Pattern Recognition Letters, Computers in Human Behavior, Displays, Electronics, Entropy, IEEE Access, Neurocomputing

SELECTED PROJECTS

- **Post-Training for Segmentation Output Refinement** [Mar 2026–Present]
Developing segmentation-specific post-training strategies using SFT, GRPO- and DSO-style preference optimization to select and refine correct masks from ambiguous candidate generations, targeting more accurate and clinically reliable final segmentations.
Methods & Skills: Post-Training, SFT, GRPO, DSO, Reinforcement Learning, Preference Optimization, Medical Image Segmentation.
- **Parameter-Efficient Fine-Tuning for Language-Guided Medical Segmentation** [Jan 2026–Present]
Developed a LoRA-based PEFT framework for clinical text-guided medical image segmentation, reducing trainable parameters by 83.9% (47.77M $\rightarrow$ 7.68M) and GFLOPs by 62.8% (20.31G $\rightarrow$ 7.55G), achieving 90.94 Dice / 83.38 mIoU on QaTa-COV19 and 81.71 Dice / 69.08 mIoU on MosMedData+, within 0.52 Dice / 0.88 mIoU and 0.24 Dice / 0.34 mIoU of the full DD-CMD baseline (MICCAI 2026 submitted).
Methods & Skills: LoRA/PEFT, Vision-Language Models, Multimodal Learning, Medical Image Segmentation.
- **Vision-Language Modeling for Medical Image Segmentation** [Oct 2025–Present]
Developed a clinical text-guided segmentation framework integrating spatial cross-attention and frequency-aware text modulation, improving performance by 1.96 Dice and 2.67 mIoU over the strongest baselines on QaTa-COV19 and MosMedData+.
Methods & Skills: PyTorch, Vision-Language Models, Multimodal Learning, Medical Image Segmentation.
- **Generative Modeling for Medical Image Segmentation** [Apr 2025–Present]
Developed a lightweight latent-to-latent generative segmentation framework with 1.07M trainable parameters, outperforming GMS by 0.93 Dice, 1.26 IoU, and 0.81 px HD95, with an additional 3.51 Dice gain on BUS/BUSI cross-domain evaluation.
Methods & Skills: PyTorch, Generative Modeling, Semantic Segmentation, Diffusion/VAE-Based Representation.

- **Ultra-Lightweight Architectures for Medical Image Segmentation** [Mar 2024–Present]
Designed efficient segmentation architectures for resource-constrained skin lesion analysis, producing AULUNet and MambaLiteUNet with up to 85.32% mIoU / 92.08% DSC on ISIC2017 using only 0.029M parameters and 0.069 GFLOPs, and 93.09% average Dice across four dermoscopy benchmarks.
Methods & Skills: PyTorch, Efficient AI, Deep Learning, Semantic Segmentation.
- **Efficient Visual Object Tracking under Challenging Conditions** [Mar 2019–Feb 2024]
Developed Siamese-, attention-, and sequence-modeling-based tracking frameworks for robust target tracking under occlusion, appearance change, deformation, and background clutter, evaluated on OTB50/100, VOT2017, VOT2018, TC-128, and UAV123.
Methods & Skills: PyTorch, Siamese Tracking, Attention Mechanisms, Visual Object Tracking.
- **Edge-Based Traffic Object Detection and Motion Estimation** [Sep 2021–Dec 2021]
Developed an edge-oriented traffic perception pipeline for vehicle and pedestrian detection, tracking, and motion estimation from intersection-camera imagery, supporting position and velocity estimation across roadway, sidewalk, and crosswalk regions.
Methods & Skills: Edge AI, Object Detection, Object and Lane Tracking.

STUDENT MENTORING

- **Current and Recent Student Mentoring**
 - **Group Mentoring**, Sketch Recognition Lab (SRL), TAMU, Jan. 2026–Present.
 - * **Group 1**, Nitya Khurana, Harrison Li, Yuqing Cao, and Ayaan Budhwani. Topic: Gender Bias in AI Models.
 - * **Group 2**, Fawwaz Memon, Nethum Weerasinghe, Armaan Khatwani, and Vidhu Karthik. Topic: Segment Anything Model (SAM) for Medical Image Segmentation.
 - * **Group 3**, Kaarthi Vedere, Ore Olayinka, Rivan Adhikari, and Rohan Doshi. Topic: Cross-Modality Translation (CT-to-MRI Generation).
 - **Rachit Patel**, BS in CS, TAMU, Sep. 2025–Present. Topic: Efficient Architectures for Medical Image Analysis.
 - **Phillip Ronin**, BS in CS, TAMU, Sep. 2025–Dec. 2025. Topic: Early-stage Guidance in ML, DL, and CV for Real-world Projects.
 - **Sayok Bose**, BS in CS, TAMU, Sep. 2025–Dec. 2025. Topic: Deep Learning Architectures for Medical Image Segmentation.
 - **Arunima Chowdhury**, MS in CS, TAMU, May. 2025–Dec. 2025. Topic: Transformer-based Models for Polyp Segmentation.
 - **Ashwin Parameswaran**, BS in CS, TAMU, Jun. 2024–Oct. 2025. Topic: Polyp Segmentation with Boundary-aware Feature Extraction.
- **Mentoring with Publication Outcomes**
 - **Hemish Radadiya**, MS in CS, Lamar University, Co-mentoring, Jul. 2025–Dec. 2025. Outcomes: *IEEE COINS*.
 - **Deblina Mazumder Setu**, MS in CS, University of Barishal, Bangladesh, Co-mentoring, 2024–2026. Outcomes: *Engineering Reports* (2026), *Franklin Open* (2025), and *IEEE ICCIT* (2024).
 - **Meet Arvindbhai Monpara**, MS in CS, Lamar University, Co-mentoring, Jul. 2025–Dec. 2025. Outcome: *RoboticCC* (2025).
 - **Afrin Hayat**, BS in CS, University of Barishal, Bangladesh, Co-mentoring, 2024. Outcome: *IEEE ICCIT* (2024).
 - **Abhyudaya Singh Tak**, Visual AI Lab, Kyungpook National University, South Korea, Co-mentoring, 2022. Outcome: *MITA* (2022).