Amit Adate

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Research Interests

Machine Learning, Deep Learning, Computer Vision, Optimization

Education

2020 – 2026 (Expected) — **Northwestern University, USA**.
Ph.D. in Computer Engineering
Co Advisors: Dr. Aggelos K Katsaggelos and Dr Alan V Sahakian

2018 – 2020 — **Northwestern University, USA**.
Masters of Science in Computer Science
Co Advisors: Dr Kristian J Hammond and Dr. Aggelos K Katsaggelos

2014 – 2018 — **Vellore Institute of Technology, India**.
Bachelor of Technology in Computer Science
Advisor: Dr. B. K. Tripathy

Professional Experience

Sep 2020 – Present — **Graduate Research Assistant**, *Image and Video Processing Lab*.
Northwestern University
Guide: Dr Aggelos K Katsaggelos

Sept 2021 – Dec 2021 — **Teaching Assistant EE 375-475**, *Machine Learning: Foundations, Applications, and Algorithms*.
Northwestern University
Instructor: Dr Aggelos K Katsaggelos

August 2017 – July 2018 — **Undergraduate Research Assistant**, *Soft Computing Lab*.
VIT University
Guide: Dr B K Tripathy

May 2017 – July 2017 — **Research Intern**, *CISCO Systems, Inc.*
Advanced Services Team
Worked on Large Scale Parallel Parsing (XML)

Projects

Nov 2024 – Present — **AI-assisted Early Skin Cancer Detection in Complex Wounds**.
Research Project: Developing deep learning models for early detection of cutaneous squamous cell carcinoma in patients with complex wounds. Collaboration with Northwestern Medicine and Feinberg School of Medicine. Presented at Annual General Internal Medicine Research Day, November 2025.

July 2024 – Present — **Multi-Modal Ensemble Learning for Rare Disease Diagnosis**.
Research Project: Building ensemble learning frameworks to detect cutaneous squamous cell carcinoma in Recessive Dystrophic Epidermolysis Bullosa patients using multi-modal medical imaging data. Presented at NUCATS I.AIM Informatics & Data Science Forum, July 2025.

April 2022 – Dec 2024 — **Using Deep Learning for Early Detection of Squamous Cell Carcinoma (SCC) in EB**.
Research Project: Built end-to-end machine learning models for classification and segmentation of skin cancer lesions within curated images of patients with Epidermolysis Bullosa (EB).

2023 – 2024 — **Intracranial Hemorrhage Detection on Head CT Scans**.
Research Project: Developed weakly supervised deep learning models for automatic detection and localization of image-level intracranial hemorrhage using study-level labels. Published in Radiology: Artificial Intelligence, 2024.

January 2021 – March 2022	**Detecting Screen Presence within Egocentric Videos**. Research Project: Detected screen-watching behavior in longitudinal studies using activity-oriented cameras. Achieved 30% improvement over state-of-the-art. Presented at IEEE PerCom 2022.
Jan 2020 – Sep 2020	**Latent Space Optimization Framework for Conditional Generative Models**. Research Project: Optimization aspects of conditional generative networks towards controlled image synthesis. Submitted to Transactions on Neural Networks and Learning Systems.
June 2017 – April 2018	**S-LSTM-GAN: Shared Recurrent Neural Networks with Adversarial Training**. Combined Long-Short-Term-Memory models with generative modeling for image generation. Published at ICDECT 2017

Selected Publications

Nov 2025	*AI-assisted Early Skin Cancer Detection in Complex Wounds.* **A Adate***, AN Kho, AK Katsaggelos, AS Paller, A Reimer-Taschenbrecker, A Furmanchuk - Annual General Internal Medicine Research Day, Chicago, IL
July 2025	*Multi-Modal Ensemble Learning for Rare Disease Diagnosis: Detecting Cutaneous Squamous Cell Carcinoma in Recessive Dystrophic Epidermolysis Bullosa.* A Furmanchuk, **A Adate***, B Nardone, A Reimer-Taschenbrecker, A Paller, A Kho, A Katsaggelos - NUCATS I.AIM Informatics & Data Science Forum, Chicago, IL
Radiology AI - 2024	*Precise image-level localization of intracranial hemorrhage on head CT scans with deep learning models trained on study-level labels.* Y Wu, M Iorga, S Badhe, J Zhang, DR Cantrell, EJ Tanhehco, N Szrama, AM Naidech, M Drakopoulos, ST Hasan, KM Patel, TA Hijaz, EJ Russell, S Lalvani, **A Adate**, TB Parrish, AK Katsaggelos, VB Hill - Radiology: Artificial Intelligence, Volume 6, Issue 6, 2024 **[Link]**
PERCOM - 2022	*Detecting Screen Presence with Activity-Oriented RGB Camera in Egocentric Videos.* **A Adate**, S Shahi, R Alharbi, S Sen, Y Gao, AK Katsaggelos, N Alshurafa - IEEE International Conference on Pervasive Computing and Communications, 2022 **[Link]**

Technical Skills

Programming

Python, Matlab, C, C++, LaTeX

Frameworks / Libraries

PyTorch, TensorFlow, scikit-learn, OpenCV, Keras

CUDA : Low-level kernel programming (SIMT), parallel algorithms, GPU optimization

Gurobi, Jupyter, Git

Notable Graduate Coursework

Deep Learning: Foundations, Applications, and Algorithms (Prof. Aggelos Katsaggelos)

Advanced Computer Vision (Prof. Ying Wu)

Advanced Computer Architecture (Prof. Nikos Hardavellas)

Massively Parallel Programming with CUDA (Prof. Nikos Hardavellas)

Statistical Machine Learning (Prof. Han Liu)

Computational Photography (Prof. Oliver Cossairt)

Integer Programming (Prof. Simge Kucukyavuz)

References

Available upon request