**BIO**

Welcome to AIINS Lab. At AIINS Lab, we believe in science that inspires. Our mission is to connect talented young researchers from around the world, providing them with a platform to explore their potential and contribute to groundbreaking discoveries. We work at the intersection of Computer Vision, Artificial Intelligence, Machine Learning, Generative AI, Health Informatics, and Environmental Modelling, with a shared focus on building intelligent systems that enhance human interaction and improve lives. Our ultimate goal is global outreach, fostering collaboration, sharing knowledge, and turning innovative ideas into impactful solutions.

**News**

1. Jul, 2025 Published preprint on A Review of Fact-Checking in arXiv
2. Jul, 2025 Published preprint on Liver and Tumor Segmentation in arXiv
3. Jul, 2025 Published Q1 journal paper on Few-Shot Segmentation in Journal of Cancer Research and Clinical Oncology
4. Jun, 2025 Published Q1 journal paper on Gastrointestinal Video Classification in Engineering Applications of Artificial Intelligence (IF 8)
5. May, 2025 Published journal paper on Identifying Blood Cell Type in Biomedical Engineering Advances
6. Apr, 2025 Published Q1 journal paper on Unsupervised Skin Cancer Detection in CAAI Transactions on Intelligence Technology (IF 8.4)
7. Mar, 2025 Published Q1 journal paper on Cervical Spine Fracture Detection in Biomedical Signal Processing and Control
8. Jan, 2025 Published Q1 journal paper on Self-Supervised Classification in Scientific Reports
9. Jan, 2025 Published Q1 journal paper on Endometrial Cancer Diagnosis in Computer Methods and Programs in Biomedicine
10. Dec, 2024 Published journal paper on Respiratory Disease Diagnosis with XAI in Frontiers in Computer Science
11. Sep, 2024 Published Q1 journal paper on Otitis Media Diagnosis in Array
12. Sep, 2024 Published Q1 journal paper on Cervical Cancer Classification in Multimedia Tools and Applications
13. Jul, 2024 Published journal paper on Behavior based group recommendation in SN Computer Science
14. Jul, 2024 Published Q1 journal paper on A Systematic Review on Otitis Media in IEEE access
15. Jun, 2024 Published Q1 journal paper on Breast Tumor Mesh Reconstruction and Classification in Journal of Imaging Informatics in Medicine
16. May, 2024 Published journal paper on Malignancy Pattern Analysis of Breast in Digital Health
17. Feb, 2024, Published Q1 journal paper on A Review on LLMs in IEEE Access, Cited by 640 (as of Aug, 2025)
18. Feb, 2024 Published Q1 journal paper on Breast Cancer Classification in Journal of Imaging Informatics in Medicine
19. Nov, 2023 Published Q1 journal paper on Pixel-level image analysis on broncho-artery (BA) in Intelligent Systems with Applications
20. Aug, 2023 Published Q1 journal paper on Multi-Class Text Data Classification in IEEE Access
21. Aug, 2023 Published Q1 journal paper on Effectiveness of Deepfake Models in Journal of sensor and actuator networks
22. Jun, 2023 Published Q1 journal paper on Broncho-Arterial (Ba) Pair Segmentation in Biomedicines
23. May, 2023 Published Q1 journal paper on Diabetic Retinopathy Images Classification in Biomedicines
24. May, 2023 Published Q1 journal paper on Feature-Map Analysis in Intelligent Systems with Applications
25. May, 2023 Published Q1 journal paper on Diabetic Retinopathy Images Classification in IEEE Access
26. Jan, 2023 Published Q1 journal paper on Pulmonary Image Analysis in Biomedicines
27. Aug, 2022 Published Q1 journal paper on Skin Cancer Classification in PloS one

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<!-- Left Section -->

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<h3> Applied Artificial Intelligence and Intelligent Systems (AAIINS) Lab</h3>

<p>Professor Sami Azam</p>

<p>Discipline Chair, Information Technology</p>

<p>Faculty of Science and Technology, Charles Darwin University, Australia</p>

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<h3>Research Areas</h3>

<ul>

<li>Health Informatics</li>

<li>Machine Learning </li>

<li>Computer Vision </li>

<li>Generative AI</li>

<li>Environmental Modelling</li>

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<h3>Contact</h3>

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**AAIINS Research**

**Artificial Intelligence:** At AAIINS, we conduct research across the broad spectrum of Artificial Intelligence to build systems capable of intelligent behavior. This includes developing algorithms for reasoning, planning, natural language understanding, and decision-making. Our work combines symbolic AI with modern machine learning techniques to address real-world challenges. The goal is to advance AI systems that can collaborate with humans and improve efficiency in various industries.

**Machine Learning:** Our Machine Learning research centers on developing algorithms that enable computers to learn from data and improve over time without explicit programming. We explore supervised, unsupervised, and reinforcement learning methods using advanced deep learning architectures. We emphasize scalability and robustness of models to handle large and complex datasets. Especially, we work on interpretability and fairness in machine learning to ensure responsible AI deployment.

**Computer Vision:** Our research in Computer Vision focuses on enabling machines to interpret and understand visual data from the world. We develop advanced deep learning models for image and video analysis, object detection, recognition, and scene understanding. Our work aims to enhance applications like autonomous systems, medical imaging, and surveillance.

**Generative AI:** In Generative AI, we focus on designing models that can create new and realistic content such as images, text, audio, and even video. These models enable creative applications like content generation, data augmentation, and synthetic data creation. By improving the quality and diversity of generated content, we aim to unlock new possibilities in human-computer interaction.

**Health Informatics:** Our research in Health Informatics involves applying AI and machine learning to diverse types of healthcare data including medical images, physiological signals, electronic health records (EHR), 2D/3D scans, videos, time-series data, clinical reports, and numeric data. We develop advanced models to extract meaningful insights, support diagnosis, monitor patient health, and predict outcomes. By integrating multi-modal health data, we aim to improve personalized medicine and healthcare decision-making. Our work also focuses on natural language processing for clinical text and developing interpretable AI tools tailored to medical applications.

**Environmental Modelling:** We use AI and machine learning techniques to create models that simulate and predict environmental systems and changes. This includes climate modeling, pollution tracking, biodiversity monitoring, and ecosystem dynamics. Our research integrates data from satellites, sensors, and simulations to enhance accuracy and reliability. Our models help understand complex interactions within natural systems and anticipate future environmental impacts.

**Associate Director of Research**

**Mohaimenul Azam Khan Raiaan**

**Research Coordinator and Quality Assurance**

**Nur Mohammad Fahad**

**Sadia Sultana Chowa**

Sadia Sultana Chowa is a remote Research Assistant at Charles Darwin University, Australia, under the supervision of Prof. Sami Azam. Her research focuses on Computer Vision, Medical Image Analysis, Artificial Intelligence, and Large Language Models.

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**Research Administrator**

**Arefin Ittesafun Abian**

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**Sadi**

**Graduate Researchers**

**Wasimul Karim**

**Sayeem Been Zaman**

**Zeba**

Musarrat Zeba is an aspiring software engineer who has completed her B.Sc. in Computer Science and Engineering from United International University. Her expertise lies in backend development, building scalable and secure server-side systems, APIs, and database solutions. She has a strong interest in machine learning, artificial intelligence, and large language models, and aims to integrate these technologies to solve real-world challenges.

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**Abdullah Al Mamun**

Abdullah Al Mamun specializes in building secure, intelligent solutions for the fintech world, with core strengths in Java Spring Boot REST API development and Large Language Model (LLM) applications. He has contributed to high-impact financial systems such as BEFTN, RTGS, payment gateways, and Ababil — an Islamic Core Banking System — delivering robust backend services and seamless integration with front-end platforms. One of his notable achievements is the design of an LLM-powered Shariah Auditing System that automates compliance for Islamic banking. Abdullah holds a B.Sc. in Computer Science & Engineering with a major in Data Science from United International University, Dhaka, where he developed a strong foundation in AI, data analysis, and intelligent systems.

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**Kishoare Jahan Tithi**

Kishoar Jahan Tithee, a Software Quality Assurance Engineer with expertise in manual and automation testing across fintech and telecommunication domains who has completed her B.Sc. in Computer Science and Engineering from Daffodil International University. She has tested core banking systems and high-traffic consumer mobile applications, ensuring quality through tools like Selenium, Cypress, Appium, Postman, and JMeter, with strong proficiency in API testing. Her passion for ensuring quality, strongly motivates her in research on large language models, machine learning, and artificial intelligence to advance software testing and develop impactful, effective, and intelligent quality assurance solutions.

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**Delwar Shahadat Deepu:**

I’m Delwar Shahadat Deepu, currently working as a contractual lecturer at United International University. I’m a machine learning enthusiast, lecturer, and researcher, passionate about making complex CS topics easy and engaging for students.

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**Fatiha**

Fatiha Binta Masud is an emerging researcher and technology enthusiast with a strong interest in Machine Learning, Deep Learning, and Computer Vision. She has worked on developing advanced deep learning models that leverage attention mechanisms and multi-scale feature fusion to improve classification accuracy and localization in complex visual recognition tasks. She is currently developing a multimodal framework that integrates chest X-ray analysis with automated medical report generation, employing fusion-based deep learning and explainable AI to enhance transparency, interpretability, and diagnostic performance.

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**Arnisha**

Arnisha Akter is a tech enthusiast with a strong interest in Data Science and Software Engineering. Her work spans software development, data science, and machine learning, with a focus on multimodal approaches for medical report generation from text and images. She is currently developing a multimodal framework that integrates chest X-ray analysis with automated medical report generation, employing fusion-based deep learning and explainable AI to enhance transparency, interpretability, and diagnostic performance. She also has experience in developing and training large language models, as well as contributing to diverse software development projects over the past two years.

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**Eashrat Jahan**

**Shahil Yasar Haque**

**Undergraduate Researchers**

**Md. Adnanul Islam**

**Nahi**

I am Md Mehedi Alam Nahi, a final-year Bachelor of Science student in Computer Science and Engineering at United International University (UIU). My research interests include Computer Vision and biomedical signal processing, with a current focus on separating lung and heart sounds.

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**Noman**

Md Noman Hossain is passionate about AI applications, with core interests in Computer Vision, Semi-Supervised learning, and Large Language Models. His work focuses on integrating state-of-the-art object detection and segmentation techniques for environmental monitoring, explainable AI and information reliability challenges. He has recently worked on Marine Pollution Mapping using Deep Learning with spatial-temporal awareness.

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**Alvi**

Currently pursuing a Bachelor of Science in Computer Science and Engineering at United International University (UIU), Bangladesh, I am deeply fascinated by the transformative potential of Generative AI and Large Language Models (LLMs) in solving complex, real-world problems once thought impossible. My research interests include Computer Vision, LLMs, and Multimodal Machine Learning, with a particular curiosity for exploring the emerging and ever-evolving capabilities of LLMs. Beyond academics, I am committed to my work and studies with strong dedication, and I find inspiration through traveling, anime, animals. I aspire to contribute to cutting-edge AI innovations that bridge technical advancements with meaningful societal impact.

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**Shahed**

Ariful Haque Shahed is an undergraduate Mathematics student at Shahjalal University of Science and Technology. His work integrates mathematical modeling with AI and ML, focusing on multispectral imaging for bushfire forecasting to enhance early detection, spread prediction, and environmental resilience.

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**Abhishek Nag**

Abhishek Nag is an undergraduate student in the Department of Mathematics at Shahjalal University of Science and Technology. His primary research interests lie in the application of mathematical modeling techniques to address complex environmental challenges. He is particularly focused on integrating advanced methods from artificial intelligence (AI) and machine learning (ML) with mathematical frameworks to develop predictive models, optimize resource management, and support sustainable decision-making in environmental systems.

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