

# S M Taslim Uddin Raju

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## Career Summary

Machine Learning Engineer with 5+ years of experience in **AI for healthcare, medical imaging, and computer vision**. Specialized in **non-invasive health monitoring, signal processing, multimodal learning, and digital pathology**, with **20+ publications** in leading venues. Proven track record of delivering real-world **ML/DL** solutions and leading interdisciplinary research projects. Looking for challenging opportunities to apply my skills.

## Education

<b>University of Waterloo (UW), Waterloo, ON, Canada</b>	Sep 2023 – Apr 2025
<ul style="list-style-type: none"><li><b>MASc</b> in Electrical and Computer Engineering (ECE)   CGPA: - <b>85%</b></li><li>Fully funded thesis-based Master's program supported by <b>Graduate Research Studentship (\$65,000)</b></li></ul>	
<b>Khulna University of Engineering &amp; Technology (KUET), Khulna, Bangladesh</b>	Apr 2015 – Dec 2022
<ul style="list-style-type: none"><li><b>MSc.</b> and <b>BSc.</b> in Computer Science and Engineering (CSE)   CGPA: - <b>4.00/4.00</b> and <b>3.85/4.00</b></li></ul>	

## Technical Skill

**Technical Skills:** Python, Keras, Tensorflow, Pytorch, Scikit-learn, OpenCV, C/C++, Java

**Tool and Technologies:** Git, VS Code, LaTeX/Overleaf, Jupyter Notebooks, Docker, Azure, Spyder

**Database:** Oracle 10g, MySQL

## Experience

<b>Machine Learning Graduate Researcher</b> , Pattern Analysis and Machine Intelligence Lab, UW   <b>(1.5 yrs)</b>	Sep2023 – Apr2025
<ul style="list-style-type: none"><li>Advanced research in caption generation from histopathological <b>whole slide image (WSI)</b> through <b>Transformer</b> and <b>UNet-Based Adversarial Autoencoder</b> architectures. (<b>Published in IEEE SMC 2024, tier B conference</b>)</li><li>Specialized in <b>microscopic WSI</b> analysis, developing <b>Vision Transformers</b> and <b>Graph Neural Networks</b> for advanced digital pathology tasks, such as classification and caption generation with <b>LLMs</b> (<b>Accepted in IJCNN 2025, A* conference</b>)</li></ul>	
<b>Graduate Researcher</b> , Khulna University of Engineering & Technology   <b>(2.5 yrs)</b>	Jun 2019 – Jan 2022
<ul style="list-style-type: none"><li>Pioneered a <b>non-invasive 850 nm NIR-LED</b> wearable device integrated with a <b>smartphone</b> to capture <b>fingertip videos</b> dataset and <b>PPG signal</b> extraction.</li><li>Engineered advanced ML pipelines—leveraging <b>Deep Neural Networks (DNNs)</b> and <b>Multigene Genetic Programming (MGPP)</b>—to estimate blood glucose, hemoglobin, and creatinine levels from <b>PPG</b> extracted features (<b>Published IEEE Access, Biomedical Signal Processing and Control, Elsevier</b>)</li></ul>	
<b>Lecturer</b> , Computer Science and Engineering, Khulna University of Engineering & Technology	Dec 2020 – Aug 2023
<ul style="list-style-type: none"><li>Instructed undergraduate courses in <b>ML</b> and <b>Data Structures &amp; Algorithms</b>, focusing on theories and practical applications.</li><li>Supervised and guided lab sessions in <b>AI</b> and <b>C programming</b>, enhancing hands-on coding and problem-solving skills.</li></ul>	

## Selected Projects

<b>GNN-ViTCap: GNN-Enhanced Microscopic WSI Classification and LLMs Based Captioning</b>	Sep 2024 – Apr 2025
<ul style="list-style-type: none"><li>Designed integrated framework combining GNNs and LLMs for WSI classification and pathology captioning.</li><li>Achieved high accuracy with <b>BLEU-4 = 81.1%</b> and <b>METEOR = 56.7%</b>, with <b>BioMedGPT</b> in image captioning</li></ul>	
<b>LLM-Q&amp;A: Automated Medical Q &amp; A Systems Using Fine-Tuned Large Language Models</b>	May 2024 – Sep 2024
<ul style="list-style-type: none"><li>Implemented an automated medical Q&amp;A system by fine-tuning <b>LLM</b> models such as <b>GPT-2, Llama2, Bloom, and T5</b></li><li>Evaluated using <b>BLEU</b> and <b>ROUGE</b> metrics, with <b>T5</b> showing superior performance in generating accurate medical answers</li></ul>	
<b>TransUAAE-CapGen: Caption Generation from Histopathological Whole Slide Images</b>	Sep 2023 – Apr 2024
<ul style="list-style-type: none"><li>Developed a hybrid <b>UNet-based Adversarial Autoencoder</b> and <b>transformer</b> to generate captions for histopathological images.</li><li>Achieved high accuracy with <b>BLEU-4 = 86.8%</b> and <b>ROUGE = 89.3%</b>, outperforming traditional <b>LSTM-based</b> models.</li></ul>	
<b>Non-Invasive Blood Component Levels Estimation Using Smartphone Fingertip Video</b>	Jan 2020 – Feb 2023
<ul style="list-style-type: none"><li>Introduced a non-invasive method for monitoring <b>Glucose and Hemoglobin</b> levels using <b>Smartphone</b> video and <b>NIR LED</b> device.</li><li>Generated <b>PPG signal</b>, extracted the PPG features and fed the features to <b>DNN-based</b> models to estimate blood component levels.</li></ul>	

## Co-Curricular & Other Activities

<ul style="list-style-type: none"><li><b>Teaching Assistant</b> at <b>University of Waterloo</b> for four terms supporting AI/ML courses.</li></ul>	Jan 2024 – Apr 2025
<ul style="list-style-type: none"><li><b>Collaboration work</b> with one <b>blood organization project</b>, Petersburg, Florida, USA.</li></ul>	Jan 2021 – Dec 2022
<ul style="list-style-type: none"><li><b>Instructor</b> for workshop on <b>C Programming in SGPIC</b> (Special Group in Programming Contest).</li></ul>	May 2015 – Feb 2019