

Prithul Sarker

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Portfolio: <https://prithulsarker.com/> | [Google Scholar](#)

EDUCATION

University of Nevada, Reno <i>Ph.D. in Computer Science</i>	Reno, NV Jan. 2021 – Dec. 2024
University of Nevada, Reno <i>MS in Computer Science</i>	Reno, NV Jan. 2021 – May 2023
Bangladesh University of Engineering and Technology <i>BS in Electrical and Electronic Engineering, Minor in Telecommunication</i>	Dhaka, Bangladesh Feb. 2013 – Sep. 2017

RESEARCH INTEREST

My research interests lie at the intersection of artificial intelligence and healthcare. I am particularly drawn to the potential of advanced machine learning techniques. My research focuses on three key areas:

Anomaly Detection and Classification with Generative Modeling: By leveraging novel methods for identifying unusual patterns using generative models, we can detect early and classify anomalies, leading to timely interventions .

Pupillometry in Extended Reality: By exploring the potential of virtual reality and eye-tracking technology to assess neurological conditions, we can gain valuable insights into neurocognitive functions.

Artificial Intelligence in Healthcare: My research involves developing AI-powered solutions for tasks such as medical image analysis and assessment-based time series data analysis, ultimately improving patient care and healthcare delivery.

EXPERIENCE

Software Engineer <i>Google</i>	Jan. 2025 – Present <i>Mountain View, CA</i>
Developed and implemented machine learning models to enhance recommendation systems at Google Discover.	
Graduate Research Assistant <i>University of Nevada, Reno</i>	Jan. 2021 – Dec. 2024 <i>Reno, NV</i>
- Utilized machine learning and score-based generative modeling to predict concussion and quantify vision defects. - Employed transformer and score-based generative modeling to classify and segment breast mass of mammograms. - Secured a \$50,000 grant as recognition for our innovation of VR based ophthalmic assessment tool.	
Team Lead / Senior Software Quality Assurance Engineer Software Quality Assurance Engineer <i>EchoLogyx Ltd.</i>	Jan. 2020 – Dec. 2020 June 2019 – Dec. 2019 <i>Dhaka, Bangladesh</i>
- Led the team to create a positive relationship with the clients contributing to 160% company growth in year 2020. - Designed and wrote script for QA automation and scraping data from the client website.	
Product Officer <i>Loence Solution</i>	July 2018 — May 2019 <i>Dhaka, Bangladesh</i>
Assistant Engineer (Electrical) <i>Energypac Engineering Ltd.</i>	Nov. 2017 – June 2018 <i>Dhaka, Bangladesh</i>

SUMMER INTERNSHIP

Ph.D. Software Engineer Intern <i>Google Research- Health AI</i>	May 2024 – Aug. 2024 <i>Mountain View, CA</i>
Temporal modeling of geospatial data with population and environmental factors to forecast disease progression.	
Software Developer Intern <i>SGX3- Science Gateways (Texas Advanced Computing Center, University of Texas at Austin)</i>	June 2023 – Aug. 2023 <i>Austin, TX</i>
- Developed applications for Frontera- world's fastest university supercomputer and 13th fastest supercomputer. - Packaged HPC applications into docker and singularity applications and making it compatible with AI framework.	
Education Mentor <i>Army Educational Outreach Program (AEOP)</i>	May 2021 – Aug. 2021 & June 2022 – Aug. 2022 <i>Reno, NV</i>

TEACHING EXPERIENCE

Instructor- GRAD778: Elements of Research Computing <i>University of Nevada, Reno</i>	Fall 2023 <i>Reno, NV</i>
Structured lessons for 70 grad students on fundamental concepts of Linux OS and Python programming.	
Teaching Assistant- CS791 Topics: Mass Detection in Mammograms <i>University of Nevada, Reno</i>	Fall 2023 <i>Reno, NV</i>

TECHNICAL SKILLS

Languages/Platforms: Python, R, C++, MATLAB, SQL, JavaScript, Bash, Docker
Python Libraries: Tensorflow, PyTorch, JAX, Pandas, Numpy, Matplotlib, Scikit-learn, Selenium
Research Area: Time Series Analysis, Pupillometry in Virtual Reality, Applied AI in Healthcare, Computer Vision

PROJECTS

Multi-View Mammogram Classification with Swin-Transformer <i>PyTorch</i> GitHub	June 2023 - Jan 2024
Video Maker Bot <i>Python, Selenium, YouTube API, Google Text-to-Speech</i> GitHub Demo	Oct. 2022 – Present
Developed a bot that makes video in Bengali from Facebook posts using google voice and uploads in social media.	
ChatGPT Code Snippet Extension <i>JavaScript, HTML, CSS</i> GitHub	Feb 2023 – Present
Developed a chrome extension which lets you save code snippet suggested by ChatGPT in your browser.	
VR-Chess <i>C++, Unreal Engine</i> GitHub	Jan. 2022 – June 2022
Implemented an interactive chess game in VR where the user can have a 3D view from any angle of the board.	
Bangladeshi Student Association Website <i>CSS</i> GitHub Demo	Jan. 2022 – Present
Social Media Interaction Bot <i>Python, Selenium, HTML</i> GitHub	Feb. 2020 – May 2020
Created a bot that logs in social media (Twitter, Instagram, Facebook), and interacts (like, comment) with posts.	
Face Recognition in Real Time Video <i>Python, OpenCV</i> GitHub	Oct. 2019 – Mar. 2020
Implemented a python program to localize faces from real time video and recognize them with 85% accuracy.	

PUBLICATIONS

- Prithul Sarker**, Sushmita Sarker, George Bebis, Alireza Tavakkoli, “MV-Swin-T: Mammogram Classification with Multi-view Transformer”, [IEEE International Symposium on Biomedical Imaging \(Conference 2024\)](#)
- Prithul Sarker**, Nasif Zaman, Joshua Ong, Phani Paladugu, Molly Aldred, Ethan Waisberg, Andrew G. Lee, Alireza Tavakkoli, “Test-retest Reliability of Virtual Reality Devices in Quantifying for Relative Afferent Pupillary Defect”, [Translational Vision Science & Technology \(Journal 2023\)](#)
- Prithul Sarker**, Nasif Zaman, Alireza Tavakkoli, “VR-SFT: Reproducing Swinging Flashlight Test in Virtual Reality to Detect Relative Afferent Pupillary Defect”, [International Symposium on Visual Computing \(Conference 2022\)](#)
- Prithul Sarker**, Joshua Ong, Nasif Zaman, Sharif Amit Kamran, Ethan Waisberg, Phani Paladugu, Andrew G. Lee, Alireza Tavakkoli “Extended Reality Quantification of Pupil Reactivity as a Non-invasive Assessment for the Pathogenesis of Spaceflight Associated Neuro-ocular Syndrome: A Technology Validation Study for Astronaut Health”, [Life Sciences in Space Research \(Journal 2023\)](#)
- Prithul Sarker**, Khondker Fariha Hossain, Isayas Adhanom, Philip Pavilionis, Nicholas Murray, Alireza Tavakkoli, “Analysis of Smooth Pursuit Assessment in Virtual Reality and Concussion Detection using BiLSTM”, [International Symposium on Visual Computing \(Conference 2022\)](#)
- Prithul Sarker**, Sushmita Sarker, George Bebis, Alireza Tavakkoli, “ConnectedUNets++: Mass Segmentation from Whole Mammographic Images”, [International Symposium on Visual Computing \(Conference 2022\)](#)
- Prithul Sarker**, Joshua Ong, Nasif Zaman, Sharif Amit Kamran, Ethan Waisberg, Phani Paladugu, Andrew G. Lee, Alireza Tavakkoli, “Investigating the Pathogenesis of Spaceflight Associated Neuro-ocular Syndrome with Head-mounted Visualization Engineering of Pupil Reactivity” (Poster at North American Neuro-Ophthalmology Society- NANOS Annual Conference 2023)
- Prithul Sarker**, Alireza Tavakkoli, “An Arduino-based Lightweight and Reliable Solution to Detect Relative Afferent Pupillary Defect” (Poster at Optica Fall Vision Meeting 2022)

Sushmita Sarker, **Prithul Sarker**, Gunner Stone, Ryan Gorman, Alireza Tavakkoli, George Bebis, Javad Sattarvand, "A Comprehensive Overview of Deep Learning Techniques for 3D Point Cloud Classification and Semantic Segmentation", Machine Vision and Applications (Journal 2024)

Joshua Ong, Ethan Waisberg, Mouayad Masalkhi, Alex Suh, Sharif Amit Kamran, Phani Paladugu, **Prithul Sarker**, Nasif Zaman, Alireza Tavakkoli, Andrew G. Lee, "Spaceflight-to-Eye Clinic": Terrestrial Advances in Ophthalmic Healthcare Delivery from Space-Based Innovations", Life Sciences in Space Research (Journal 2024)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Sharif Amit Kamran, Nasif Zaman, **Prithul Sarker**, Andrew G Lee, Alireza Tavakkoli, "GPT-4: A New Era of Artificial Intelligence in Medicine", Irish Journal of Medical Science (2023)

Joshua Ong, Ethan Waisberg, Sharif Amit Kamran, Phani Paladugu, Nasif Zaman, **Prithul Sarker**, Alireza Tavakkoli, Andrew G. Lee, "Deep Learning Synthetic Angiograms for Individuals Unable to Undergo Contrast-guided Laser Treatment in Aggressive Retinopathy of Prematurity", Nature Eye (Journal 2023)

Ethan Waisberg, Joshua Ong, Nasif Zaman, Sharif Amit Kamran, **Prithul Sarker**, Alireza Tavakkoli, Andrew G. Lee, "GPT-4 for Triaging Ophthalmic Symptoms", Nature Eye (Journal 2023)

Nasif Zaman, **Prithul Sarker**, Alireza Tavakkoli, "Calibration of Head Mounted Displays for Vision Research with Virtual Reality", Journal of Vision

Mouayad Masalkhi, Ethan Waisberg, Joshua Ong, Nasif Zaman, **Prithul Sarker**, Andrew G Lee, Alireza Tavakkoli, "Apple Vision Pro for Ophthalmology and Medicine", Annals of Biomedical Engineering (Journal 2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Nasif Zaman, **Prithul Sarker**, Andrew G Lee, Alireza Tavakkoli, "The Future of Ophthalmology and Vision Science with the Apple Vision Pro", Nature Eye (Journal 2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Nasif Zaman, Sharif Amit Kamran, **Prithul Sarker**, Alireza Tavakkoli, Andrew G Lee, "The Case for Expanding Visual Assessments During Spaceflight", Prehospital and Disaster Medicine (Journal 2023)

Ethan Waisberg, Joshua Ong, Sharif Amit Kamran, Nasif Zaman, Phani Paladugu, **Prithul Sarker**, Alireza Tavakkoli, Andrew G. Lee, "Further Characterizing the Physiological Process of Posterior Globe Flattening in Spaceflight Associated Neuro-ocular Syndrome with Generative Adversarial Networks", Journal of Applied Physiology (2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Nasif Zaman, Sharif Amit Kamran, **Prithul Sarker**, Andrew G. Lee, Alireza Tavakkoli, "Text-to-image Artificial Intelligence to Aid Clinicians in Perceiving Unique Neuro-ophthalmic Visual Phenomena", Irish Journal of Medical Science (2023)

Joshua Ong, Ethan Waisberg, Mouayad Masalkhi, Sharif Amit Kamran, Kemper Lowry, **Prithul Sarker**, Nasif Zaman, Phani Paladugu, Alireza Tavakkoli, Andrew G Lee, "Artificial Intelligence Frameworks to Detect and Investigate the Pathophysiology of Spaceflight Associated Neuro-Ocular Syndrome (SANS)", Brain Sciences (Journal 2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Sharif Amit Kamran, Nasif Zaman, **Prithul Sarker**, Alireza Tavakkoli, Andrew G. Lee, "GPT-4 and Ophthalmology Operative Notes", Annals of Biomedical Engineering (Journal 2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Nasif Zaman, Sharif Amit Kamran, **Prithul Sarker**, Andrew G Lee, Alireza Tavakkoli, "Generative Pre-Trained Transformers (GPT) and Space Health: A Potential Frontier in Astronaut Health During Exploration Missions", Prehospital and Disaster Medicine (Journal 2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Nasif Zaman, **Prithul Sarker**, Andrew G Lee, Alireza Tavakkoli, "Apple Vision Pro and Why Extended Reality will Revolutionize the Future of Medicine", Irish Journal of Medical Science (2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Nasif Zaman, Sharif Amit Kamran, **Prithul Sarker**, Andrew G Lee, Alireza Tavakkoli, "ChatGPT and Medical Education: A New Frontier for Emerging Physicians", Canadian Medical Education Journal (2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Nasif Zaman, **Prithul Sarker**, Andrew G Lee, Alireza Tavakkoli, "Apple Vision Pro and The Advancement of Medical Education with Extended Reality", Canadian Medical Education Journal (2023)

Ethan Waisberg, Joshua Ong, Sharif Amit Kamran, Mouayad Masalkhi, Nasif Zaman, **Prithul Sarker**, Andrew G Lee, Alireza Tavakkoli, "Bridging Artificial Intelligence in Medicine with Generative Pre-trained Transformer (GPT) Technology", Journal of Medical Artificial Intelligence (2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Nasif Zaman, **Prithul Sarker**, Andrew G Lee, Alireza Tavakkoli, "Apple Vision Pro: The Future of Surgery with Advances in Virtual and Augmented Reality", Irish Journal of Medical Science (2023)

Ethan Waisberg, Joshua Ong, Nasif Zaman, Sharif Amit Kamran, **Prithul Sarker**, Alireza Tavakkoli, Andrew G Lee, "Extended Reality for Strabismus Screening in Developing Countries", Nature Eye (Journal 2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Nasif Zaman, Sharif Amit Kamran, **Prithul Sarker**, Alireza Tavakkoli, Andre G Lee, "Optical Coherence Tomography Analysis of International Space Station Astronauts", Investigative Ophthalmology & Visual Science (Abstract 2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Nasif Zaman, **Prithul Sarker**, Andrew G Lee, Alireza Tavakkoli, "Google's AI chatbot "Bard": A Side-by-side Comparison with ChatGPT and Its Utilization in Ophthalmology", Nature Eye (Journal 2023)

Alex Suh, Joshua Ong, Sharif Amit Kamran, Ethan Waisberg, Phani Paladugu, Nasif Zaman, **Prithul Sarker**, Alireza Tavakkoli, Andrew G Lee, "Retina Oculomics in Neurodegenerative Disease", Annals of Biomedical Engineering (Journal 2023)

Ethan Waisberg, Joshua Ong, Mouayad Masalkhi, Nasif Zaman, **Prithul Sarker**, Andrew G Lee, Alireza Tavakkoli, "GPT-4 to Document Ophthalmic Post-operative Complications", Nature Eye (Journal 2023)

Khondker Fariha Hossain, Sharif Amit Kamran, **Prithul Sarker**, Philip Pavilionis, Isayas Adhanom, Nicholas Murray, Alireza Tavakkoli, "Virtual-Reality based Vestibular Ocular Motor Screening for Concussion detection using Machine-learning", International Symposium on Visual Computing (Conference 2022)

AWARDS & CERTIFICATIONS

Outstanding International Graduate Student Award <i>University of Nevada, Reno - Graduate Student Association</i>	Spring 2024 <i>Reno, NV</i>
NSF National Innovation Corps (I-Corps™) program <i>Entrepreneurial Training Program (Seven weeks) (\$50,000 Awarded)</i>	July 2022 – Sep. 2022 <i>New York City, NY</i>
Undergraduate Student Merit Scholarship <i>Bangladesh University of Engineering and Technology</i>	Feb. 2013 – Sep. 2017 <i>Dhaka, Bangladesh</i>

UNDERGRADUATE THESIS

Statistical Modeling of Effluent Generated from Proposed Rampal Power Plant for Environmental Impact Assessment

Oct. 2016 – Sep. 2017

- The primary objective of the thesis was to ensure less emission of SO_x and NO_x compared to subcritical and supercritical technologies.
- Analyzed and interpreted the direction of wind of that locality to ensure the prevention of the mangrove forest from the power plant generated SO_x and NO_x emissions.