

Waseem Shariff

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CAREER OBJECTIVE

As I continue my journey as a PhD candidate and R&D Machine Learning Engineer, my ambition is to refine my expertise and establish myself in the field of computer vision, machine vision, and edge computing. I am dedicated to evolving into a proficient ML researcher with a keen focus on the design, deployment, and enhancement of intelligent systems.

EDUCATION

Ph.D., Electrical and Electronic Engineering (Specializing in Artificial Intelligence). **Sept 2022 – Jan 2025**

University of Galway

Studies on Neuromorphic-Time-Event camera based In-Cabin Cognition, Wellbeing & Non-contact Health Analytics for Drivers & Occupants

Masters in Artificial Intelligence (1:1-First class honours) **Sept 2019 - Sept 2020**

National University of Ireland Galway, Ireland

Thesis – Synthetic Face ID Generation using Generative Adversarial Network (GAN)

Major Courses Studied: Machine Learning (ML) - Deep Learning (DL) – Embedded Image Processing - Data

Visualization - Natural Language Processing - Programming and Tools for AI - Research in AI

Bachelor of Computer Science and Engineering (CGPA: 8.2/10) **Aug 2015 - May 2019**

Nagarjuna College of Engineering and Technology, India

Thesis – Image Understanding and Captioning

Major Courses Studied: Data Structures - Operating Systems – Object-Oriented-Programming using Java - Software Engineering - Micro-Controller - Database Management

WORK EXPERIENCE

“R&D-Machine Learning Engineer” at FotoNation Ltd. (Tobii) **Sept 2022- Present**

- Leading the development of innovative methods to harness neuromorphic event cameras for driver monitoring, enhancing driver safety, and promoting well-being.
- Contributed to the development of the world's first-ever neuromorphic driver monitoring system, contributing insights to the field of driver safety and well-being.
- Multiple Time-Event technology projects including driver distraction, drowsiness, drive safety-seatbelt, super resolving neuromorphic event streams, and more importantly event camera configuration with event biases.
- Mentored PhD students by providing guidance on research direction and focus, while offering additional support in experimentation and publications to senior doctoral candidates.
- Authored multiple peer-reviewed papers on neurotrophic event cameras for driver monitoring, with a focus on:
 - Advancing object detection techniques for enhanced driver safety.
 - Innovating camera calibration methods and sensitivity control using event biases.
 - Developing resource-efficient and robust neural networks, reducing computational demands while maintaining high reliability.

“Lead Teaching Assistant” at University of Galway, Ireland. **Sept 2022 – Dec 2024**

- Supervised teaching assistants and managed lab sessions, guiding students through hands-on projects involving embedded/mobile devices.
- Assisted in curriculum development and provided technical support for complex embedded system and mobile device concepts.
- Mobile Devices [2022- Lead]
- Embedded Systems [2023- Lead]
- Embedded Systems [2024- Co-Lead]

“Research Assistant” at National University of Ireland Galway **April 2021 – Aug 2022**

- Worked on ‘[HELIAUS](#)’ project funded by the European Union ECSEL program. Focused on the development of smart thermal perception systems with overall funding of 485,873.75 Euros allocated for National University of Ireland Galway.
- I contributed on building a novel large-scale thermal dataset comprising of > 35,000 distinct frames

and co-authored in three IEEE journals and Transaction Journal.

- Developed pipelines that use YOLO-v5 trained on thermal data to detect roadside objects. Further, worked to optimize the trained networks for deploying on GPU and edge platforms (such as Nvidia-Jetson Nano and Nvidia- Xavier) for onboard computer testing.
- Main contributor from university side towards the driver monitoring data acquisition for more than 100 subjects each for 24 hours. Also trained multiple data technician for the same work.
- The acquisition setup comprises four camera modules, including RGB, NIR, LWIR (thermal), and Neuromorphic Event Cameras, along with multiple health sensors such as SpO2, ECG, EEG, EOD, breathing sensors, etc. Furthermore, the frequent customer visits necessitated my role in detailing each aspect of the acquisition setup.

“R&D-Machine Learning Intern” at XPERI (FotoNation, Ireland)

May-August 2020

- This internship was part of my master’s Thesis Collaboration under the guidance of Prof Michael Schukat and Prof Peter Corcoran.
- Employed the advanced capabilities of the StyleGAN deep learning framework, which facilitated the generation of diverse, synthetic, yet highly photorealistic facial images, pushing the boundaries of digital identity creation.
- Conducted in-depth research and application of various Generative Adversarial Network (GAN) tools alongside different neural network architectures, significantly broadening the scope and effectiveness of the synthetic "Face-ID" system.
- Successfully produced a wide array of facial samples, each exhibiting unique poses, expressions, and appearances under a multitude of lighting scenarios, showcasing the versatility and realism of the generated synthetic identities.
- Throughout the project, acquired and sharpened technical skills in programming and data analysis using Python, honed image processing abilities with OpenCV, and mastered the application of key deep learning frameworks, including TensorFlow, Keras, and PyTorch, enhancing overall proficiency in machine learning and artificial intelligence applications.

“ML Fellowship” at Athens Information Technology (Athens, Greece)

June –July 2018

- During my summer internship, I engaged in two significant projects under the mentorship of Dr. Aristodemos Pnevmatikakis.
- Face Recognition with OpenCV and Deep Learning: This project focused on leveraging OpenCV and deep learning techniques for various facial recognition tasks. My responsibilities included:
 - Face Identity Classification, Age Recognition, Gender Recognition, Emotion Recognition
- Scene Understanding and Captioning Based on YOLOv3 Detection: This project aimed at interpreting scenes in images and generating descriptive captions based on the objects detected. My main contributions were:
 - Scene Explanation: Analyzing images to understand the scene context.
 - Caption Generation: Creating captions that accurately describe the scene based on the objects identified using YOLOv3 detection.

Publications

Top Open Access Journal Publications [[more](#)]

1. W. Shariff, P. Kielty, Joe Lemley and Peter Corcoran - Face Detection using Hybrid SNN-ANN to process Neuromorphic Event Stream in IEEE Access, 2025 [Lead [Paper](#)]
2. W. Shariff, MS Dilmaghani, P. Kielty, Joe Lemley and Peter Corcoran Neuromorphic Driver Monitoring Systems: A Computationally Efficient Proof-of-Concept for Driver Distraction Detection, in IEEE Open Journal of Vehicular Technology, 2023 [Lead [Paper](#)]
3. W. Shariff, MS Dilmaghani, P. Kielty, M. Moustafa, J. Lemley and Peter Corcoran Event Cameras in Automotive Sensing: A Review, in IEEE Access 2024 [Lead [Paper](#)]
4. Ryan, Cian and Elrasad, Amr and Shariff, Waseem and Lemley, Joe and Corcoran, Peter, Real-Time Multi-Task Facial Analytics with Event Cameras, in IEEE Access, 2023. [Lead [Paper](#)]
5. M. S. Dilmaghani, W. Shariff, J. Lemley and P. Corcoran, Optimization of Event Camera Bias Settings for a Neuromorphic Driver Monitoring System. [[Paper](#)]
6. P. Kielty, M. S. Dilmaghani, W. Shariff, C. Ryan, J. Lemley and P. Corcoran Neuromorphic Driver Monitoring Systems: A Proof-of-Concept for Yawn Detection and Seatbelt State Detection Using an Event Camera, in IEEE Access, 2023 [[Paper](#)]
7. M. A. Farooq, W. Shariff and P. Corcoran, Evaluation of Thermal Imaging on Embedded GPU Platforms for Application in Vehicular Assistance Systems, in IEEE Transactions on Intelligent Vehicles, 2023. [[Paper](#)]

Conference Publications

1. W. Shariff, J. Lemley, and Peter Corcoran, Event Stream Super Resolution using Sigma Delta Neural Network, accepted at European Conference of Computer Vision (**ECCV**-NeVi) workshop 2024. [Lead [Paper](#)]
2. W. Shariff, Farooq MA, Lemley J, Corcoran P. Event-based YOLO object detection: proof of concept for forward perception system. In Fifteenth International Conference on Machine Vision (ICMV 2022) 2023 [Lead [Paper](#)]
3. M. S. Dilmaghani, W. Shariff, J. Lemley and P. Corcoran, AutoBiasing Event Camera, in **ECCV**-NeVi Workshop, 2024. [[Paper](#)]
4. K.Iddrisu, W. Shariff, J. Lemley, and S. Little [[Paper](#)]
Evaluating Image -Based Face and Eye Tracking with Event Cameras in **ECCV**-NeVi Workshop, 2024.
5. W. Shariff, M. Dilmaghani, P. Keilty and Corcoran P.
Sensing Without Seeing - Event Camera Privacy. Irish Machine Vision and Image Processing Conference (IMVIP 2023) [Lead [Paper](#)]
6. Mehdi Sefidgar Dilmaghani, Waseem Shariff, Cian Ryan, Joe Lemley, Peter Corcoran
Control and evaluation of event cameras output sharpness via bias (ICMV 2022) [[Paper](#)]

Open-Source Dataset Publication

Muhammad Ali Farooq, Waseem Shariff, Faisal Khan, Peter Corcoran, Cosmin Rotariu, March 26, 2022, "C3I Thermal Automotive Dataset", IEEE Dataport, doi: <https://dx.doi.org/10.21227/jf21-rt22>.

SKILLS

Programming and Development:

- Advanced proficiency in Python, with extensive experience in data manipulation, machine learning, and image processing using libraries such as Pandas, NumPy, Scikit-Learn, OpenCV, and interactive computing with Jupyter Notebook.
- Solid understanding of design patterns in Python to enhance code efficiency, maintainability, and scalability.
- Previously demonstrated expertise in Java, C++, and C with expertise in database management.
- Competent in R programming for data visualization, skilled in GGLOT, DPLYR, CVD, and R markdown for insightful data presentations.

Machine Learning & Deep Learning Frameworks:

- Proficient in using PyTorch, TensorFlow, and Keras, for developing and deploying machine learning and deep learning models, demonstrating a strong foundation in AI technologies.
- Model deployment experience on Neuromorphic Loihi2 deployment, Nvidia-Jetson and Raspberry-Pi.

ACHIEVEMENTS

- Award holder of Irish Research Council Employment based PhD Scholarship 2022.
- Achieved a Nano degree in Computer Vision Udacity. (In the Year 2020)
- Multiple Deeplearning.ai Certifications in Neural Networks and Convolution Neural Networks.
- Certified in Machine Learning using Scikit-Learn from Data-Camp. (In the Year 2019)
- Table Tennis Champion in office level competition-2023. s