Shahid Shabeer Malik

My Portfolio LinkedIn E-mail: shahid.malik@slu.edu

PROFESSIONAL SUMMARY

Results-driven Computer Vision, Machine Learning, and Robotics Engineer with hands-on experience in neural networks, machine learning, and vision systems, including 3D reconstruction and real-time perception using vision sensors. Skilled in developing neural networks, integrating diverse vision sensors, and working with simulation engines to optimize dynamic perception in robotics and autonomous systems. Demonstrated expertise in software development, deep learning, neural networks, and sensor fusion, with a focus on delivering intelligent, adaptive systems for real-world applications.

EDUCATION

Ph.D. Computer Science, Saint Louis University, St. Louis, Missouri, USA (**Sept 2023 - Present)**
B.Tech. Computer Science and Engineering, Jamia Hamdard University, New Delhi, India **(Aug 2020 - Jul 2023)**
Diploma in Computer Engineering, Jamia Millia Islamia University, New Delhi, India **(Aug 2017 - May 2020)**

WORK EXPERIENCE

Graduate Research Assistant, SLUAIR Lab, Saint Louis University (Nov 2024 - Present)

- Developed real-time event-driven vision solutions for autonomous systems, including 3D reconstruction and motion compensation from event camera data. Integrated event data with traditional sensors (RGB, IMU, polarization) for improved perception in dynamic environments.
- Led research on enhancing 3D reconstruction in low-light conditions using event cameras and rotating polarization lenses, enabling more accurate pose estimation and object detection.
- Engineered a pipeline for satellite pose estimation using Structure from Motion (SfM) with event data, leveraging Multi-View Stereo (MVS) and Gaussian Splatting for dense reconstruction.
- Implemented simulation environments in Carla and Unreal Engine for sensor validation and data acquisition, using ROS for real-time data integration and control.

Teaching Assistant, Saint Louis University (Sept 2023 - May 2024)

- Assisted in Deep Learning and Applied Machine Learning courses by mentoring students in neural network implementations, providing support for troubleshooting, and guiding project development.

Project Lead, SLUAIR Lab, Saint Louis University (Project with Master's Students for Deep Learning Course)

- Led a multidisciplinary team of graduate students in developing a computer vision project for enhancing feature tracking using the fusion of event camera and RGB camera, overseeing the entire pipeline from data acquisition to model implementation.
- Guided team members through neural network design and integration, optimizing model performance for real-time applications.
- Managed project timelines, coordinated tasks, conducted regular meetings, and ensured successful project completion.

Associate Technical Support, Tech Mahindra Pvt. Ltd, Noida, India (2 months)

- Troubleshoot network issues for the Netgear project, providing technical support to USA clients.

Summer Undergraduate Research Intern, IIIT Nagpur (Jun 2022 - Aug 2022)

- Analysed and implemented skin cancer detection algorithms, comparing CNN models (InceptionV3, ResNet50, AlexNet) and segmentation methods (Otsu, Active Contour, K-means) on medical imaging datasets.
- Achieved high accuracy with Otsu's method, resulting in an Intersection over Union (IoU) of 0.80 and F1 score of 0.88.

Summer Intern, Evision Technoserve Pvt. Ltd, Noida, India (Jul 2019 - Aug 2019)

- Gained proficiency in AWS Cloud technologies, including storage, scaling, and deployment. Deployed web applications using Auto Scaling and Load Balancer on AWS.

KEY PROJECTS

Neural Networks for Event-to-Frame Reconstruction

- Designed and implemented neural networks incorporating recurrent and attention modules to convert event streams into frame-like representations.
- Optimized network architectures for real-time processing and improved accuracy in dynamic environments.

Event-Based 3D Reconstruction for Autonomous Systems

- Developed a novel approach combining rotating polarizer lenses with event cameras, enhancing perception of transparent and specular surfaces.
- Compared performance against conventional polarization cameras and implemented real-time event generation.

Satellite Pose Estimation Using Event Cameras

- Led the development of a pipeline for satellite pose estimation, combining event data with Structure from Motion techniques, resulting in accurate 3D reconstructions for space applications.

PulseCheck

- Developed a web-based feedback platform using React and TypeScript, facilitating peer evaluations and instructor monitoring in an educational setting.
- Implemented CI/CD pipelines and version control using Git to ensure streamlined development and deployment.

Roomate4U

- Created a web-platform to connect room owners with students, used by hundreds of students from Jamia Millia Islamia and Jamia Hamdard University. Presented the related conference paper.

TECHNICAL SKILLS

- **Programming**: Python, C++, Java, MATLAB, JavaScript, HTML5, CSS3, PHP
- **Frameworks**: PyTorch, TensorFlow, Keras, React, Node.js
- **Tools**: ROS, Docker, OpenCV, SQL, AWS, Unreal Engine, Carla Simulation
- **Operating Systems**: Linux, Windows

PUBLICATIONS

- **Shahid Shabeer Malik**, Maryam Moshrefizadeh, Omar Tahri, Xiaoli Bai, Erik Blasch, Vasit Sagan, Hadi AliAkbarpour. *"EvSat3D: Satellite Pose Estimation and 3D Reconstruction with Event Camera."* IEEE Access (In submission).
- **S.S. Malik**, A. Khan, Dr. Sapna Jain, "*Roomate4U- An online platform that provides accommodation facilities to college students*". I presented this research paper in the International Conference on ICT for sustainable development in Goa, India. It is published in the book series "ICT Systems and Sustainability" of Springer Nature.
- **Shahid Shabeer Malik**, "*Skin Lesion Segmentation using Active Contour, Otsu's Thresholding and K-Means Clustering: A comparative Analysis"* (Conditionally accepted for publication in IEEE Xplore).
- **Shahid Shabeer Malik**, Aneeque Khan, "*Anxiety, Depression and Stress prediction among college students using Machine Learning Algorithms"* (Published at IEEE Xplore).

AWARDS

- Best Creative Presentation, Principles of Software Development, Saint Louis University (Spring 2024)

ADDITIONAL PROFESSIONAL HIGHLIGHTS

- Received an internship offer from **Neurobus**, Paris, France, to work on implementing reinforcement learning for autonomous drone navigation using event cameras and other sensors.

LANGUAGES

- English (Fluent), Urdu (Native)