Dipon Kumar Ghosh

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Google Scholar: https://scholar.google.com/citations?user=Y1p-qPcAAAAJ

CAREER OBJECTIVE

I am a motivated and dedicated postdoctoral researcher with expertise in Deep Learning and Computer Vision. My research focuses on *Event-based Vision, Depth Estimation, 3D Computer Vision, and Motion Estimation*. With a strong background in designing and conducting intensive experiments, I have contributed to state-of-the-art methodologies, leading to publications in high-impact venues. I am actively seeking academic and research opportunities where I can further develop innovative solutions and mentor the next generation of researchers in the field.

EDUCATION

Gachon University, Seongnam, South Korea
Ph.D. in Computing (AI Major), (March, 2022-February, 2025)

- CGPA: 4.3 (out of 4.5) (current)
- Research Area: *Artificial Intelligence, Machine Learning, Deep Learning, Computer Vision, Event-based Computer Vision, Neuromorphic Vison*
- Thesis: *Event-based Stereo Depth Estimation with Multi-modal Feature Fusion*

BRAC University, Dhaka, Bangladesh
M.Sc. in Computer Science and Engineering, (2019 - 2021)

- CGPA: 3.95 (out of 4.0)
- Thesis: *Efficient Spatio-temporal Feature Extraction for Human Action Recognition*

Jawaharlal Nehru Technological University Anantapur, AP, India
B.Tech. in Information Technology, (2014 - 2018)

- CGPA: 8.0 (out of 10.0)
- Thesis: *A Sentiment Analysis Engine from Online Product Reviews*

WORK EXPERIENCES

Postdoctoral Researcher
Gachon University, Seongnam, South Korea (March, 2025-Present)

- Working on Event-based object detection, and depth estimation
- Developing and implementing new event representation method for object detection
- Co-supervising master's students
- Writing Grant Proposals

Graduate Research Assistant

Gachon University, Seongnam, South Korea (March, 2022-February, 2025)

- Worked on numerous projects related to neuromorphic event-based vision
- Proposed state-of-the-art model for event-based video deblurring and published high quality journal
- Proposed state-of-the methods for event-based depth estimation methods and published in high quality journals

Graduate Teaching Assistant

Gachon University, Seongnam, South Korea (Fall 2023, and Fall 2024)

- Conducted tutorial sessions for a graduate-level Computer Vision course, providing hands-on coding support
- Supervised and mentored students through the completion of their term projects

Department Assistant

Gachon University (September 2024 – February 2025)

- Advised students on course selection aligned with their interests and career goals
- Developed and structured Computer Engineering courses for the newly established Gachon International School
- Managed departmental administrative tasks, and contributed to the efficient operation of the department.

PUBLICATIONS (*highlighted*)

[1] Event-based stereo matching for dense depth estimation with spatial-frequency domain fusion. **Ghosh D.K.**, Jung Y.J., (in preparation)

[2] Depth cue fusion for event-based stereo depth estimation. **Ghosh D.K.**, Jung Y.J., *Information Fusion [IF 14.7]* (2024)

[3] Two-stage cross-fusion network for event-based stereo depth estimation. **Ghosh D. K.**, Jung Y. J., *Expert Systems with Applications [IF 8.5]* (2023)

[4] Event-based video deblurring based on image and event feature fusion. Kim J., **Ghosh D. K.**, Jung Y. J., *Expert Systems with Applications [IF 8.5]* (2023).

[5] A Spatio-Temporal Graph Convolutional Network Model for Internet of Medical Things (IoMT). **Ghosh, D. K.**, Chakrabarty, A., Suh, D.Y. and Piran, M. J., *Sensors* (2022).

[6] Efficient Learning-driven Spatio-temporal Feature Extraction for Violence Detection in IoT Environments. **Ghosh, D. K.**, Chakrabarty, A., Mansoor, N., Suh, D. Y. and Piran, M. J., 2021 International Conference on Information and Communication Technology Convergence (ICTC), South Korea.

(more at Google Scholar)

RESEARCH PROJECTS

Neuromorphic Event Stereo Camera for Depth Sensing

- Developed three state-of-the-art model to estimate depth from event camera data
- Proposed two-stage cross fusion method for better image and event feature fusion for event-based stereo depth estimation
- Proposed a method to fuse event and image features in both spatial and frequency domain to enhance event-based stereo depth.
- Develop methods to fuse multiple depth cues for event camera for event-based stereo depth estimation
- Proposed *SpadeFormer* fusion module to combine multiple depth cues (i.e., stereo, monocular, and parallax depth) to enhance performance of event-based stereo depth estimation.

Video Deblurring with Neuromorphic Event Camera

- Developed state-of-the-art model for event-based video deblurring
- Proposed efficient event and image fusion method, and performed extensive experiments

Violence Action Detection

- Developed *Multi-dimensional Neural Network* to detect violent actions from video clips.
- The model achieved state-of-the-art accuracy in the largest violent detection dataset.
- The efficient feature-extraction method enabled the model to achieve high accuracy only from RGB frames.

Skeleton-based Action Recognition

- Developed *Redefined Spatio-temporal Graph Convolutional* network to identify actions from skeleton data.
- The model achieved competitive accuracy in challenging skeleton-based action recognition dataset despite having fewer parameters.

Sentiment Analysis

- Developed a sentiment analysis system that analyzes the sentiments of product reviews and categorizes the product according to the reviews.
- Used Bayesian Classifier algorithm to build the sentiment analysis system. The model was trained on reviews of products collected from different e-commerce websites.

SKILLS

Programming Languages

- Python, C/C++, R, MATLAB

Libraries and Frameworks

- PyTorch, Keras, TensorFlow
- Scikit-learn, OpenCV, Pillow, Scikit-image, ROS
- NumPy, Matplotlib, Seaborn, Pandas

DevOps Tools

- Git, Docker

Web Technologies

- HTML, CSS, JavaScript, Flask, Django, React

Miscellaneous

- MS Office, LaTex

MISCELLANEOUS

Academic Services

- Served as a reviewer in the following venues:
  - CVPR; AAAI;
  - TCSVT; Expert Systems with Applications; Signal, Image, and Video Processing; Scientific Reports

Awards and Scholarships

- Received **Excellent Performance Award** for contribution in AI and Computer Vision from **Gachon University**
- Received research assistantship from **Computer Vision and Image Processing Lab, Gachon University**
- Received GL Scholarship for tuition fee waiver from **Gachon University**
- Received Merit scholarship from **BRAC University**.
- Received prestigious **Indian Council for Cultural Relations** (ICCR) scholarship, which covered undergraduate tuition fees and monthly stipend.

Programming Competitions and Hackathons

- ACM-ICPC Amritapuri onsite regional contest
- Tata Consultancy Service (TCS) programming contest
- SRM Hackathon (organized by SRM, Chennai and Github)
- IndiaHacks Conference (organized by HackerEarth)