Aniket Konkar
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PUBLICATIONS

H. Kumar, **A. Konkar**. *Simple Transformer with Single Leaky Neuron for Event Vision.* **Feb 2025**
Proceedings of the Winter Conference on Applications of Computer Vision (WACV) Workshops, 2025, pp. 928-934

A. Konkar, X. Qu. *A Review of Transformer-Based and Hybrid Deep Learning Approaches for EEG Analysis.* **Jun 2025**
International Conference on Human-Computer Interaction (HCI International) 2025.

EDUCATION

Master of Science in Computer Science **May 2025**
The George Washington University | GPA: 3.71/4.00 Washington, DC
Thesis: Enhancing EEG-Based Gaze Prediction with Transformers on EEGEyeNet
Relevant Courses: Computational Linear Algebra, Machine Learning, Neural Networks & Deep Learning, Computer Vision

Bachelor of Engineering in Information Technology **Oct 2020**
University of Mumbai Mumbai, India

RESEARCH AND WORK EXPERIENCE

Resarch Assistant **Oct 2025 – Present**
GW Vision Lab Washington, DC

- Creating a dataset of event camera recordings of various objects responding to sound stimuli, where audio not recorded.
- Since event cameras can capture tiny, rapid brightness changes, sound becomes visible in the form of motion as it physically vibrates objects. Checkout this post to view more information: See Motion from Sound with Event Cameras.
- Investigating methods to reconstruct acoustic signals from event-based visual input. Research Advisor: Dr. Robert Pless.

Software Engineer (Volunteer) **Mar 2025 – Present**
National Collegiate Table Tennis Association (NCTTA) Remote

- Developing and maintaining core features for the NCTTA web application using .NET Core MVC.
- Improved backend performance by 20% by optimizing inefficient SQL queries, removing duplicate data-fetch operations, introducing proper indexing, and streamlining model–controller data flow to reduce unnecessary server load.
- Created extensive documentation covering framework updates, architectural decisions, and new feature behaviors.

Research Assistant **Nov 2023 – Oct 2025**
GW Institute of Public Policy Washington, DC

- Performed statistical data analysis, modeling to evaluate the impact of career pathway programs. PI: Dr. Robert Olsen.
- Developed robust data cleaning and transformation pipelines for multi-site program evaluation datasets.
- Applied statistical modeling and A/B testing to measure treatment effects, using FIRC regression and empirical Bayes estimators. Built Python automation pipelines that parsed the generated descriptive statistics and automatically produced structured analysis reports.

Software Engineer **Aug 2020 – Jun 2022**
Larsen & Toubro Infotech Mumbai, India

- Developed Spring Boot microservices and implemented Selenium-based test automation for an internal Capital Markets platform for our client, Citi Bank, ensuring compliance with corporate QA standards.
- Saved 8 hours of manual testing effort per week by automating complex end-to-end test scenarios using Java & TestNG.
- Optimized SQL queries and improved API efficiency, contributing to a 25% reduction in data retrieval time. Collaborated with cross-functional teams to translate functional specifications into modular, maintainable software components.

TEACHING & TUTORING EXPERIENCE

Teaching Assistant – CSCI 1011. Introduction to Software Development, GW **May 2025 – Aug 2025**
Teaching Assistant – CSCI 1112. Algorithms and Data Structures, GW **May 2025 – Aug 2025**
Teaching Assistant – CSCI 2113. Software Engineering, GW **May 2025 – Aug 2025**
Student Tutor – GW Athletics **Sep 2023 – May 2025**

- MATH 1221. Calculus with Precalculus II.
- MATH 1232. Single-Variable Calculus II.
- MATH 3125. Linear Algebra II.
- CSCI 1011. Introduction to Programming with Java.
- CSCI 1112. Algorithms and Data Structures.

SELECTED PROJECTS

From-Scratch Implementation of a Low-Level Image Classification Network – Python [*Report*] GitHub

- Developed a complete neural network training pipeline in Python (without using deep learning libraries).
- Implemented manual forward pass, backpropagation, gradient updates, and weight initialization.
- Built custom image preprocessing modules (posterization, enhancement, feature extraction) to improve data quality and model performance.

Right Whale Individual Identification – PyTorch GitHub

- Developed a deep learning-based solution to identify individual Right Whales from images. See Kaggle task details here.
- Preprocessed raw whale images by resizing & training a localization network to extract whale heads. Trained a secondary neural network to detect blowhead & bonnet coordinates, applying affine transformations for consistent head alignment.
- Trained a pretrained Vision Transformer model from Hugging Face, conducted inference using the image classification pipeline to distinguish individual whales accurately. Credits: Preprocessing approach was followed from here.

Landmark Recognition – Python, Streamlit GitHub

- Developed a landmark recognition web application that predicts landmarks from images, retrieves their full address with latitude/longitude, and visualizes them on an interactive map for exploration.
- Leveraged a pretrained tensorflow-hub model, trained on the Google Landmarks Dataset V2.

Real-Time Person Detection & Tracking – Python GitHub

- Developed a real-time person detection and tracking pipeline using YOLOv8x for detection and DeepSORT for tracking.
- Evaluated multiple tracking methods (IOU, SORT, DeepSORT). Tested on an NVIDIA RTX 3070.

Forecasting Hourly Electricity Demand and Assessing Grid Resilience – Python [*Report*]

- Fine-tuned machine learning models (LSTM and Prophet) to predict hourly electricity demand from national grid data.
- Evaluated how major disruptions (like storms or accidents) influence grid performance, turning data-driven insights into recommendations for stronger energy systems.

TECHNICAL SKILLS

Programming Languages: C, C++, Embedded C, Python, MATLAB, R, SQL, Java, JavaScript
Frameworks & Libraries: PyTorch, Keras, Tensorflow, NumPy, Pandas, OpenCV, Scikit-learn, Matplotlib
DL Architectures: MLP, CNN, RNN, LSTM, Self-Attention, Transformers, Attention-Based Fusion, VAE, GAN, LLM
Computer Vision: Image formation & camera optics, Camera calibration & geometry, Feature tracking, Optical flow, Pose estimation, SfM, Visual Odometry, SLAM
Domain Skills: Event-Based Vision, Spiking Neural Networks, Robot control, State estimation, Sensor fusion, Motion planning, ROS, CUDA, ONNX, TensorRT, Linux, BASH

REFERENCES

Robert Pless, *Arnold C. Meltzer Endowed Professor of Computer Science, GW* (pless@gwu.edu)
Robert Olsen, *Research Professor, GW Institute of Public Policy* (robolsen@gwu.edu)
Rahul Simha, *Professor of Computer Science, GW* (simha@gwu.edu)