Kaynat Rana

Nationality: Pakistani **Date of birth:** 15/02/1995 **Gender:** Female

Phone: (+92) 03230539201 **Phone:** (+92) 03230539201

Email: kayynat@gmail.com **Skype:** kayynat.rana

Whatsapp Messenger: +923119811421

Facebook: https://www.facebook.com/kaynatRana01

Instagram: https://www.instagram.com/kaynatRana01

LinkedIn: https://www.linkedin.com/in/kaynatrana01

Home: New city phase 2 block A street 6 house no 50 wah cantt, 47010 wah cantt (P akistan)

ABOUT MYSELF

I completed my undergraduate studies in Electrical Engineering at Comsats University, Islamabad, Pakistan, in 2016. Following that, I pursued my Master's degree in Electrical Engineering at University of Engineering and Technology, Taxila, Pakistan specializing in Electronics in 2020. After that I attended COMSATS University, Islamabad, Pakistan, for Master's degree in Electrical Engineering specializing in Computer Engineering, which I completed in 2024. My research focuses on leveraging Machine Learning techniques for various applications such as Medical Imaging, Agricultural Imaging. I have a keen interest in nature-inspired algorithms, particularly bio-inspired optimization algorithms, which I consider as a central aspect of my research pursuits.

WORK EXPERIENCE

Lecturer

HITEC University Taxila [29/01/2023 – Current]

City: Taxila | **Country:** Pakistan

As a university lecturer, I juggle a variety of duties. These encompass creating captivating lectures for students, evaluating assignments and exams, conducting research, publishing findings in academic papers, offering guidance and mentorship to students, and participating in departmental and university activities. Moreover, I oversee graduate students, cooperate on academic committees, and engage with the broader scholarly community through conferences, workshops, and other academic interactions.

Lab Engineer

HITEC University Taxila [17/09/2017 – 29/01/2023]

City: Taxila | **Country:** Pakistan

In my role as a lab engineer, I undertook a variety of responsibilities. These included overseeing the smooth operation of laboratory equipment, ensuring adherence to safety protocols, conducting experiments and analyses, maintaining accurate records of experimental data, troubleshooting technical issues, collaborating with researchers on projects, and assisting in the development of new experimental protocols. Additionally, I was involved in training and supervising laboratory technicians, participating in quality control initiatives, and engaging with colleagues and collaborators to share insights and findings from our work.

Visiting Lecturer

TEVTA [04/09/2016 – 04/11/2016]

City: Taxila | **Country:** Pakistan

During my tenure as a visiting lecturer, my dedication was directed toward delivering high-quality education and cultivating an inclusive learning environment for all students. I brought forth a fresh perspective and specialized expertise in a particular field of study to the university community. Collaborating closely with faculty members and

administrators, I ensured that my teaching efforts were in harmony with the academic standards and objectives of the university.

EDUCATION AND TRAINING

Master of Science in Electrical Engineering

Comsats University Islamabad, Wah Campus [05/01/2022 – 17/01/2024]

City: Wah Cantt | **Country:** Pakistan | **Website:** https://cuiwah.edu.pk/ | **Field(s) of study:** Artificial Intelligence / Deep Learning | **Final grade:** 3.79 / 4.00 | **Thesis:** Skin Lesion Segmentation Using Improved Meta-Heuristic Contrast Stretching Technique

Master of Science in Electrical Engineering

University of Engineering and Technology [20/09/2016 – 21/09/2020]

City: Taxila | **Country:** Pakistan | **Website:** https://www.uettaxila.edu.pk/ | **Field(s) of study:** Artificial Intelligence / Image Processing | **Final grade:** 2.96 / 4.00 | **Thesis:** A Hybrid Active Control Model for Simultaneos Segmentation and Bias Estimation of Inhomogeneous Images

Bachelor of Science in Electrical Engineering

COMSATS Institute of Information Technology [20/08/2012 – 21/06/2016]

City: Wah Cantt | **Country:** Pakistan | **Website:** https://cuiwah.edu.pk/ | **Field(s) of study:** Artificial Intelligence | **Final grade:** 3.54 / 4.00 | **Thesis:** Highly Parallel GPU Based Motion Tracking Algorithm

Intermediate in Pre Engineering (FSC)

BISE Islamabad [08/2010 – 08/2012]

City: Wah Cantt | **Country:** Pakistan | **Website:** https://www.fbise.edu.pk/ | **Final grade:** 712 / 1100

Matriculation with Science

BISE Rawalpindi [04/2008 – 08/2010]

City: Taxila | **Country:** Pakistan | **Website:** https://www.biserawalpindi.edu.pk/ | **Final grade:** 854 / 1050

LANGUAGE SKILLS

Mother tongue(s): Urdu | Panjabi; Punjabi

Other language(s):

English

LISTENING B2 **READING** C1 **WRITING** B2

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user

DIGITAL SKILLS

Computer VIsion / Deep Learning (Tensorflow, Pytorch(basic), Jax/Flax(basic)) / Machine Learning / Artificial Intellegience / computer engineering / Programming (Python, MATLAB) / C C++ C Java

PUBLICATIONS

[2020]

Hybrid active contour based on local and global statistics parameterized by weight coefficients for inhomogeneous image segmentation

Asim Niaz, **Kaynat Rana**, Aditi Joshi, Asad Munir, Daeun Dana Kim, Hyun Chul Song, Kwang Nam Choi.

IEEE Access

[2020]

Inhomogeneous Image Segmentation Using Hybrid Active Contours Model With Application to Breast Tumor Detection

Asim Niaz, **Kaynat Ran**a, Aditi Joshi, Asad Munir, Daeun Dana Kim, Hyun Chul Song, Kwang Nam Choi.

IEEE Access

[2020]

4x4 Bit Multiplier Designs using Different CMOS Schematics, and their Comparison

Kaynat Rana, Asim Niaz, Sumbol Hanif, Muhammad Touqeer Ali.

Technical Journal UET Taxila

PROJECTS

[01/01/2023 – 01/02/2024]

Skin Lesion Segmentation Using Improved Meta-Heuristic Contrast Stretching Technique This study has introduced and evaluated a hybrid metaheuristic method (DE-BA-ABC) for the segmentation of skin cancer. The technique is combination of Differential Evolution, Bat Algorithm and Artificial Bee Colony Algorithm. MATLAB implementation is performed to test the algorithm on PH2, ISIC-2016 and ISIC-2017 images. The results indicate that the proposed method effectively enhance images and contribute to the improved accuracy of segmentation algorithms. The implications of this research are particularly noteworthy in dermatology, providing valuable automated tools for skin cancer analysis. While recognizing the study's limitations, the promising outcomes and future research recommendations set the stage for further advancements in this field. Addressing the identified limitations and exploring the suggested research directions will allow future studies to build upon this work and enhance the diagnosis and treatment of skin cancer.

[06/2019 – 09/2020]

A Hybrid Active Contour Model for Simultaneous Segmentation and Bias Estimation of Inhomogeneous Images In this thesis, a new ACM is presented, comprising both the global and local intensity functions. Length Regularization function with the Gaussian filter is used to overcome the penalty, caused by other length terms in previous ACM models. A signed pressure force function (SPF) is appended with the length term and the area term, that ensures the contour smoothness over object boundaries and also making this method robust. The proposed method also estimates and corrects the bias field for each step until convergence is achieved. The proposed model is tested on synthetic and real-life images, including the quantitative comparison performed on inhomogeneous images from the mammograms of mini-MIAS database. Simulation results reaffirms that the proposed model outclasses previous state of the art models in terms of both the CPU time and segmentation accuracy.

[09/2015 – 06/2016]

Highly Parallel GPU Based Motion Tracking Algorithm The aim of this project is to achieve speed up for embedded GPU platform. A basic tracking algorithm was selected for mapping over NVIDIA's JETSON TK1 platform. Multiple cameras were utilized for simultaneous multi object tracking in real time. Results are compared between CPU, CPU+GPU and JETSON implementation of same algorithm.

Final Year Projects (Supervised)

- Skin Cancer Detection
- Breast Cancer Detection
- Object Tracking
- Flower Classification

KEY RESPOSIBILITIES

Labs Conducted

- Computing Fundamentals
- Programming Fundamentals
- Object Oriented Programming
- Data Structures and Algorithms
- Digital Logic Design
- Signals and Systems
- Numerical Methods
- Electric Circuit Analysis

Courses Taught

- Computing Fundamentals
- Programming Fundamentals
- Electric Circuit Analysis
- Data Structures and Algorithms
- Digital Logic Design

Management Responsibilities

- Head of Departmental Management Committee (includes Timetable, Course allocation)
- Member of Outcome Based Education preparation and Monitoring committee.
- Batch Advisor of an Undergraduate Batch
- Dedicated Lab Engineer of Computing Lab and FYP Lab in the Computer Engineering Department