Kunwar Muhammed Saaim

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EDUCATION

Aligarh Muslim University (AMU) 📅 Aug. 2017 – June 2021
Bachelor of Technology in Computer Engineering – 9.02/10 CPI 📍 *Aligarh, India*

EXPERIENCE

<u>Junior Research Fellow</u> - IIT Delhi 🔗 📅 Sep. 2021 - Present
Assistech lab (Project Lead) 📍 *New Delhi, India*

- Developing Intelligent Edge Device that aids in the mobility of visually impaired pedestrians by tackling challenges like Safety, Social Inclusion, and Navigation.
- Working on real-time face and object detection networks for Raspberry Pi accelerated using Intel Neural Compute Stick.
- Porting TensorFlow/PyTorch model to OpenVINO and integrating it into a multi-threaded control system.

<u>Research Intern</u> - IIIT Allahabad 🔗 📅 Dec. 2020 – Feb. 2021
Interactive Technologies and Multimedia Research Lab 📍 *Allahabad, India (Remote)*

- Worked on the development of Explainable AI model for Seizure Detection using EEG data.
- Reviewed literature on Explainable AI techniques.
- Designed Attention Aware Depthwise convolution based architecture for seizure detection.

<u>Research Intern</u> - KFUPM 🔗 📅 June – Nov. 2020
Dependable and Secure System Lab 📍 *Dhahran, KSA (Remote)*

- Worked on File Fragment Classification which is part of digital forensics and data carving.
- Developed a Depthwise Separable Convolution based architecture for efficient classification of data fragments; the developed model is 24 times faster than the current state-of-the-art.

<u>Undergrad Researcher</u> - AMU 🔗 📅 Dec. 2019 – March 2020
Interdisciplinary Biotechnology Unit 📍 *Aligarh, India*

- Worked on the classification of Disordered Residues in Intrinsically Disordered Proteins given in Fasta format using residual ConvLSTM network.
- Reviewed literature on deep learning techniques for drug repurposing specifically for Covid-19.

Web Development Intern 📅 June – August 2019
Olcademy 📍 *New Delhi (Remote)*

- Developed course card for e-learning platform with course title, subtitle, and ratings dynamically fetched from SQL database.
- Build signup form, with various input data validations, checked through JavaScript.

<u>Management Intern</u> 📅 April – May 2019
Arabic Computer Systems 📍 *Riyadh, KSA (Remote)*

- Acted as an intermediate for business partnership between Arabic Computer Systems and other MNCs.
- Collected partnership requirements and benefits of various companies and presented them to make better business partnership decisions.

PROJECTS

Nowcasting of Multi-spectral Satellite Imagery using Neural Networks COC4980 Grade: A+ 🔗

- Developed a novel neural network architecture based on 3D Convolutions and ConvLSTM with multi-level feature fusion in the temporal domain.
- The data for this project was provided by the Indian Space Research Organisation(ISRO) from their geostationary satellite INSAT-3D, which consists of 6 channel multi-spectral Imager and 19 channel Sounder.

In Search of Best Automated Model: Explaining Nanoparticle TEM Image Segmentation 🔗

- The study focused on finding the best segmentation model, which achieves high metrics and is robust to microscopy parameters.

- For this purpose, eight different models had been compared, i.e. U-Net, R2U-Net, Attention U-Net, BDC U-Net, U-Net ++, U-Net 3+, Attention W-Net, and k-means clustering.
- Further, the black-box neural network is also explained by visualizing the layer gradients using Grad-cam.

Retinal Image Generation and Segmentation using Generative Adversarial Networks COC3950 Grade: A+⚭
- Used progressive GAN to generate Retinal vessel segmentation maps and further used unsupervised image-to-image translation model, Cycle GAN, to translate vessel maps to fundus images.
- A paired data of fundus images and vessel segmentation masks were generated, these could be used to tackle data scarcity in bio-medical images.

Deep learning based GUI apps
- Trained a Mobile-Net architecture to predict Pneumonia in chest X-ray images with an accuracy of 97 percent, deployed it as a web app using Flask. ⭕
- Used TensorFlow object detection API to develop GUI based object detection app using PyQt5. ⭕

PUBLICATIONS

- **K.M. Saaim**, S.K. Afridi, M. Nisar, and S. Islam, In search of best automated model: Explaining nanoparticle TEM image segmentation, Ultramicroscopy (2021), doi: https://doi.org/10.1016/j.ultramic.2021.113437.
- **K. M. Saaim**, S. AlSaleh, M Felemban, A. Al-Mulhem. "Efficient File Fragment Classification using Depthwise Separable Convolutions." under review in FPS 2021.
- M. H. Khan, **K. M. Saaim**. "Markerless Pose Estimation of Aquatic Animals in Visual feed." In MTS TECHSYM-2020, IIT, Madras, February 27-29, 2020. [POSTER]

TECHNICAL SKILLS

Languages: Python, C/C++, SQL, JavaScript, HTML/CSS, MATLAB
Libraries: PyTorch, Keras, TensorFlow, OpenCV, OpenVINO, JAX, NumPy, Pandas, Matplotlib/Plotly, Rasterio, Flask, PyQt5
Developer Tools: Git, VS Code, Visual Studio, PyCharm

ACHIEVEMENTS

- Winner of best concept note award in IEEE OES and MTS Student's Symposium on Marine Technology, Indian Institute of Technology (IIT), Delhi.
- Fully sponsored by Marine Technology Society (MTS) India section to attend and present my research at a conference based on its novelty.
- Made it to the grand finale of India's Biggest Hackathon, the Smart India Hackathon (SIH).

SYMPOSIUM/WORKSHOPS/HACKATHONS ATTENDED

- Participated in **SAMHAR-COVID19 Hackathon** conducted by the Department of Science and Technology, Government of India, May 8, 2020. Presented a concept titled **"Learning Drug-Target Embedding Using Graph Neural Networks."**
- Participated in SAMADHAN online challenge conducted by the Ministry of Education innovation cell, April 15, 2020. Presented a video concept titled **"COVID-19 Hot-spot Identification and Screening Test using a Smartphone."** [VIDEO]
- Participated in three day **Smart India Hackathon (SIH)** conducted by the Ministry of Education, August 1-3, 2020. Solved problem statement for the **Indian Space Research Organization (ISRO)** on the nowcasting of satellite images. [Certificate]
- **MTS Technical Symposium on Advances in Engineering and Technology (TECHSYM-2020)**, organized by MTS India Section and Department of Ocean Engineering, Indian Institute of Technology, Madras, February 27-29, 2020 [Certificate]
- **IEEE OES and MTS Student's Symposium on Marine Technology**, organized by Indian Institute of Technology, Delhi, February 7 2020
- Participated in **hackCBS 2.0** conducted in partnership with Major League Hacking (MLH), October 19-20, 2019 [Certificate]
- Participated in **HackAMU** powered by **FOSS ASIA**, conducted by Zakir Husain College of Engineering and Technology, April 12, 2019 [Certificate]

- Attended two days' workshop on **"Machine Learning and Artificial Intelligence,"** organized by Cognizant, Indian Institute of Technology, Roorkee, March 16-17, 2019.
- Attended a two-week workshop on **"Data Analytics with Machine Learning in Python"** conducted by the Mechanical Engineering Department, Aligarh Muslim University, February 2019.

PROFESSIONAL DEVELOPMENT

Deep Learning [Certificate]   📅 Aug. – Sept. 2019
Deeplearning.ai, Coursera 'Specialisation'   📍 *Remote*
- Five-course specialization covering Convolutional Neural Networks and Sequence Models.

Machine Learning [Certificate]   📅 June – July 2019
Coding Elements   📍 *New Delhi*
- This two months offline classroom course covered hands-on machine learning and deep learning project implementation.

VOLUNTEER EXPERIENCE

Actively volunteered in 20th International Conference on **Autonomous Agents and Multiagent Systems (AAMAS2021)**   📅 3 – 7 May 2021

Google Code-in 19 Mentor at TensorFlow   📅 Nov. 2019 – Jan 2020

Member of AMU-OSS – A Group of open source enthusiasts.   📅 Aug. 2018 – Present