Ali Nawaz

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Education

Master's in Software Engineering Sep 2017 – Aug 2020
University of Engineering and Technology *Taxila, Pakistan*
- Major in Medical Imaging/ Machine & Deep Learning

BSc in Software Engineering Sep 2012 – Oct 2016
University of Science and Technology Bannu *Lahore, Pakistan*

Experience

Lead Artificial Intelligence Engineer| Horizon Tech, Pakistan. |July 2022- Present
Role: Leading two main products as team lead related to AI based Media Suit and developing ASR.

- Proficient in **Python** for developing efficient code.
- Expertise in data manipulation, statistical analysis, machine, and deep learning algorithms.
- Strong grasp of **Django** for developing APIs and web applications.
- Experienced in building deep learning models using **TensorFlow** and **PyTorch**.
- Proficient in database management systems such as **SQLite3** and **PostgreSQL**, ensuring secure, scalable, and efficient data management.
- Committed to utilizing these technologies to build innovative and efficient solutions for complex AI engineering projects.

Artificial Intelligence Engineer | Xylexa, Pakistan | Dec 2020- June 2022
Role: Worked as Artificial Intelligence Engineer on complete medical imaging pipeline.

- Advanced models for Real-time **Breast Cancer** Detection, Disease Detection, and Localization from **Chest X-rays**.
- Data Annotation and Patient **Meta Data Analysis** for Disease Classification
- Innovative solutions in disease detection and localization from Chest X-rays and Breast Cancer Detection.
- Technical and product support for **Assistive Technology Project** (Opti Key) benefiting disabled individuals.
- Volunteer experience in **Bacteria Cell Counter** project aiding biotechnologists in cell counting experiments.
- Continuously expanding my skillset by mastering various tools like **OpenCV**, **TensorFlow**, **Pytorch**, and **Keras**.
- Performing advanced data wrangling, analysis, and optimization using high-performance libraries like **Pandas**, **Numba**, **SciPy**, and **Numpy**.

Research Assistant (TA) | UET Taxila, Pakistan| March 2019- June 2020

- Application of advanced AI and machine learning techniques for **medical imaging** analysis
- Utilization of state-of-the-art deep learning algorithms for the classification and diagnosis of medical conditions using MRI data
- Hands-on experience in implementing cutting-edge AI techniques for medical image analysis in 2D and 3D imaging modalities.

Internee | National Internship Program, CMC Karak Pakistan. | March 2017- March 2018

- Worked in a Software Industry in collaboration with IT Board Peshawar KPK, Pakistan
- Served as a senior ICT Instructor at Cambridge Model College Karak KPK Pakistan

Internee | KP IT Board Internship Program, DYNIMAX Intermedia Pakistan. | Jan 2017- June 2017

- Participated in the KP IT Board Internship Program at DYNIMAX Intermedia
- Gained experience in graphic design, video editing, photography, 2D, 3D, and video production.

- Worked on diverse projects including local, government, and international projects.
- Developed proficiency in graphic design tools such as Photoshop, Illustrator, Corel Draw, and Sony Vegas.

Publications

Journals

- **A Nawaz,** SM Anwar, JA Khan “Refining Saliency Maps through Region Proposals for Improved Weakly-Supervised Thoracic Disease Localization and Classification ", journal of Biomedical and Health Informatics. Status is Submitted.
- Sohail Manzoor, Huma Qayyum, Farman Hassan, Asad Ullah, **Ali Nawaz**, Auliya Ur Rahman, "Melanoma Detection Using a Deep Learning Approach." International Journal of Innovations in Science & Technology 4.1 (2022): 222-232. [URL: https://journal.50sea.com/index.php/IJIST/article/view/191]

Peer-reviewed conferences

- **A. Nawaz**, S. M. Anwar, R. Liaqat, J. Iqbal, U. Bagci and M. Majid, "Deep Convolutional Neural Network based Classification of Alzheimer's Disease using MRI Data," 2020 IEEE 23rd International Multitopic Conference (INMIC), Bahawalpur, Pakistan, 2020, pp. 1-6. [DOI: 10.1109/INMIC50486.2020.9318172]
- Akhyar Ali Khan; Huma Qayyum; Rehan Liaqat; Fawad Ahmad; **Ali Nawaz**; Babar Younis. "Optimized Prediction Model for Type 2 Diabetes Mellitus Using Gradient Boosting Algorithm." 2021 Mohammad Ali Jinnah University International Conference on Computing (MAJICC). IEEE, 2021. [DOI: 10.1109/MAJICC53071.2021.9526257]
- J. Iqbal, M. M. Iqbal, U. Khadam and **A. Nawaz**, "Ordinary Learning Method for Heart Disease Detection using Clinical Data," 2020 3rd International Conference on Computing, Mathematics and Engineering Technologies (iCoMET), Sukkur, Pakistan, 2020, pp. 1-6, [DOI: 10.1109/iCoMET48670.2020.9074056]
- F. Ahmad, H. Ayub, R. Liaqat, A. A. Khan, **A. Nawaz** and B. Younis, "Mortality Prediction in ICU Patients Using Machine Learning Models," 2021 International Bhurban Conference on Applied Sciences and Technologies (IBCAST), Islamabad, Pakistan, 2021, pp. 372-376. [DOI: 10.1109/IBCAST51254.2021.9393012]

Projects

AI based Intelligent Media Suit (As Team Lead)

- **Python** was the primary programming language used to develop the application, leveraging its
- flexibility and ease of use.
- The **Django** framework was utilized to build the backend of the application, providing a modular
- and scalable architecture.
- **PostgreSQL** was used to store and manage the data generated by the AI-based Media Suite, allowing for efficient access and retrieval of critical media events.
- **TensorFlow** was utilized extensively to build the **deep learning** models for the electronic, social, and print media analysis.
- **PyTorch** was also used in some cases for specific model development needs.
- **Pandas** and **NumPy** were utilized for data wrangling, manipulation, and optimization, enabling efficient data processing and analysis.

Automatic Speech Recognition (ASR) system for low-resource languages

- Developed an ASR system for low-resource languages using **Python** and **PyTorch**, with a pre-trained Whisper model.
- Utilized **Pandas** and **NumPy** for data wrangling, manipulation, and optimization for accurate speech recognition.
- Built the **ASR** system with a modular architecture in **Django**, making it flexible and easy to integrate with other technologies and applications.
- Employed **SQL** as the database management system to store and manage the data generated by the ASR system.

- Conducted fine-tuning of the pre-trained **Whisper** model using **PyTorch**, enabling further optimization and adaptation to low-resource languages.

Real-Time Breast Cancer Detection

- Developed end-to-end industrial pipeline for automatic localization and classification of various breast types.
- Developed advanced models for real-time breast cancer detection using Python and TensorFlow.
- Leveraged deep learning algorithms to analyze medical images and detect signs of breast cancer.
- Utilized data annotation and patient metadata analysis to enhance the accuracy of the models.
- Achieved efficient disease classification from metadata, aiding in early detection and localization.

Region Proposals for Improved Weakly-Supervised Thoracic Disease Localization and Classification

- Developed innovative techniques to refine saliency maps through region proposals.
- Implemented advanced algorithms using Python and Pytorch to enhance weakly-supervised thoracic disease localization.
- Improved disease classification accuracy by integrating refined saliency maps into the classification pipeline.

Deep Convolutional Neural Network-based Classification of Alzheimer's Disease using MRI Data

- Built deep convolutional neural network models using Python and TensorFlow for the classification of Alzheimer's disease.
- Analyzed MRI data to detect patterns and biomarkers associated with Alzheimer's disease.
- Leveraged advanced machine learning techniques to achieve accurate disease classification.
- Contributed to the development of tools for early detection and intervention of Alzheimer's disease.

Note: There are many mini projects related to computer vision and data science are available on my GitHub.

Technical Skills

- **Languages**: C, C++, Python, HTML, CSS, JS, jQuery
- **Notable Frameworks/Libraries**:
- **Python Liabraries**: PyTorch, NumPy, OpenCV, Scikit-Image/learn/multi-label, Matplotlib, Tensor-flow/Keras, Pandas NumPy, Selenium, Matplotlib, OpenCV, Seaborn, SciPy
- **,** NumPy, Spacy, Beautiful Soup, TKinter, NLTK
- **Coding Environments**: Conda, Jupyter Notebook, PyCharm, VS Code,
- **Project Management:** Experienced in Agile and Scrum Project Management utilizing Jira Software and Microsoft Planner
- **Developer Tools**: Git, GitHub, AWS, Gitlab
- **Graphic Designing**: Adobe Photoshop, Adobe Illustrator, Sony Vagas, CorelDraw, Wonder Share video creator, Photography, Video Making and Mixing.

Awards and Honors

- **Fauji Foundation Scholarship**
  - University of Science and Technology, Bannu, Pakistan | 2012-2016
  - University of Engineering and Technology, Taxila Pakistan | 2017-2019.
- **Diya Need Base Scholarship**
  - University of Science and Technology, Bannu, Pakistan | 2013-2015
  - University of Engineering and Technology, Taxila Pakistan | 2018-2019
- **Prime Minister Laptop Scheme Winner (2017)**
  - I was in the top 5% of our batch across all majors in Department of Software Engineering

Courses & Certifications

- Machine and Deep Learning (DICE Analytics - Dec 2019)

- Deep Learning using Pytorch (Udacity - April 2020)
- Artificial Intelligence [Machine and Deep Learning] (Khamyab Jawan Program - March 2020)
- Deep Learning Specialization (Coursera - May 2020)
- National Freelancing Training Program (MITT - July 2020)
- Professional Python Programming (PSEB - August 2020)
- SCRUM Product Owner (PSEB - August 2020)
- E-Rozgaar on Creative Design (PITB - September 2020)
- AI for Medical Diagnosis (Coursera - May 2020)
- Python for Data Science Chilla (Codanics - February 2022)
- ChatGPT Prompt Engineering for Developers (Deeplearning.ai 2023)

Courses & References

- **Academics:** Associate. Prof. Engr. Dr. Syed M. Anwar, Medical Image & Signal Processing, BCI, University of Engineering and Technology, Taxila (UET), Pakistan. Email: s.anwar@uettaxila.edu.pk Contact: +92-300-5044036, Faculty Profile Page: [Link]
- **Academics:** Engr. Dr. Javed Ali Khan, Crowd Requirements Engineering, Argumentation Theory, University of Science and Technology, Bannu, Email: engr_javed501@yahoo.com Contact: 0334 8806021, Faculty Profile Page: [Link]
- **Professional:** Akif Ullah Khan CEO of DYNIMAX Intermedia SMC-PVT-LTD,
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- **Professional:** Shahid Abassi Co-Founder of XYLEXA, Email: shahid.abbasi@yahoo.com
- Contact: 0333 4506666, Website: [Link]
- **Professional:** Saher Tariq Senior A.I Engineer, NUST (NSTP), Islamabad, Email: sahertariq07@gmail.com, Contact: +92-310-9059143 Website: [Link]