TAWSIF AHMED

AI Researcher
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An Artificial Intelligence researcher. I have 3 years of experience in Artificial intelligence, mainly in the field of Natural Language Processing and Computer Vision. In the past, I have developed advanced neural network architecture for prestigious academic institutions, promising startups and personal projects. Proven success in neural net architecture, datasets preparations, mathematical functions (activations, optimizer and loss) and scalability of models. A strong understanding in NLP, CV and quite recently, Quantum Computing.

PROFESSIONAL EXPERIENCE

LEAD AI RESEARCHER
HARVARD GAMI, HAVRARD UNIVERSITY, Cambridge, MA
September 2022–Present (Full-time)

- Currently, developing state of the art artificial intelligence solutions to detect cancer in its early stages via medical scans.
- Combined grid search and second derivative optimizers to achieve high accuracy
- Developed two fully automated and semi-automated masking solutions, through FAIR's SAM and QuPath models to annotated the datasets
- Benchmarked models between first derivative and second derivative optimizer trained models
- Collaborating with *Dr. Anna Yaraslovsky (University of Massachusetts Lowell)* and *Dr. Victor Neel (Massachusetts General Hospital)* to deploy it for clinical trials in Massachusetts General Hospital by the fall.

TECHNICAL CONSULTANT
CAPVISION, New York City, New York
May 2023–Present (Part-time)

- Signed with CapVision to provide feedback to their multi-million-dollar clients at 400$ per hour rate.

LEAD AI RESEARCHER
THE PLASTIC PROJECT, Kirkland, Washington
April 2023–Present (Part-time)

- Helped high schoolers to develop a DIY powerful image classifier using Lobe.ai
- (Reverse Engineered + re-wrote WasteNet) (UK Government's waste management DL model) to classify garbage adhering to Kirkland laws.
- Working alongside the local government for the deployment of our solutions in the community and through governmental recycling applications.
- Packaged the website in PWA.

CO-FOUNDER
PINK AI, Miami, Florida
April 2023-Present (Part-time)

- Developing custom LLaMa model to tackle mental health therapy conversations

- PaLM 2, model (medical variation) to answer user's medical questions and provide a diagnosis about their mental health.
- Researching a multi-modal solution where the user can get diagnosis on their mental health and therapy through images, texts, voice and touch.
- Applying to investment to different startup competitions and seed fundings.

UI/UX DESIGNER & DEVOPS
OCTOML, Seattle, Washington
October 2022-November 2022 (Contractor)
- Provided feedback & advise to improve the platform for fast deployment by AI researchers and people will little knowledge in DevOps
- Pointed out flaws and unrequired complexities of both the UI and the DevOps portion of the platform.

BEAMLINE FOR SCHOOLS COACH
PAKISTAN ATOMIC ENERGY COMMISSION, PAKISTAN
January 2023-Present
- Taught high school students high energy physics and Machine Learning
- Helped them to develop both idea and proposal for Beamline for Schools
- Helped the students to create a Quantum Algorithm to recognise faint sounds produced by particles while they collide and recognise particles based upon that

SOFTWARE/ALGORITHM TESTER
TARTEEL AI, San Francisco, California
August 2020-September 2020 (Part-time)
1. Tasked to test app UI and voice recognition Algorithm

VOLUNTEER LECTURER
ARTE, The Open Lab, Yale University, New Haven, Connecticut
October 2021-October 2021 (2 weeks)
2. Taught New Haven School Students Electrical Physics (performing Circuits and switch making & experiments)

RESEARCH COLLABORATION
IFJ PAN INSTITUTE OF NUCLEAR PHYSICS POLISH ACADEMY OF SCIENCES
December 2021-March 2022
3. Collaborated with Krzysztof Woźniak to create DIY Neutrino Detector for Beamline for Schools competition

EDUCATION

DHAKA CITY COLLEGE, Dhanmondi, Dhaka
September 2020 – February 2023

High School Degree in (Literature + Pure Science + Maths + Computer Science),
Grade: A *(Taking a Gap Year)*
Key Points:
- Studied introductory Quantum Mechanics and advanced Mathematics
- ICT aka Computer courses included courses in Circuits, programming in C++ & web development
- Selected to be club president in two different clubs i.e. Debate & English
- Active member in all the clubs most notably being English & Art
- Worked as volunteer & planner in English club's national festival

WOLFRAM SUMMER SCHOOL, Boston, Massachusetts
June 2023-July 2023 (3 weeks)

Key Points:

- Received 100% Financial Aid (3000$) to participate in the program

Note: It is still on-going!

TAKE ACTION LAB, GLOBAL CITIZEN YEAR PROGRAM, Cape Town, South Africa
August 2023-December 2023 (3 months in South Africa)

Note: it is still on-going

SUMMER CAMPS

TECH & JOURNALISM CAMP, THE STANFORD DAILY, STANFORD UNIVERSITY, CA
September 2021-September 2021 (3 weeks)

- Accepted as one of 10 participants
- Studied fundamental knowledge of JavaScript and web development
- Studied responsible journalism and ethics
- Received 100% Scholarship

SYNTHETIC BIOLOGY CAMP, STANFORD UNIVERSITY, CA
September 2022-October 2022 (3/4 weeks)

- Studied Genetic engineering and DNA
- Performed DNA modification and Analysis using Software
- Studied Bioinformatics Algorithms and wrote them.

COLLEGE CREDITS

4TH ANNUAL CONFERENCE ON DISABILITY IN HEALTHCARE AND MEDICINE, STANFORD MEDICINE, STANFORD UNIVERSITY, CA

- Received 6.00 AMA PRA Category 1 Credit(s)TM for the live activity

COURSES

COMPUTATIONAL NEUROSCIENCE, NEUROMATCH ACADEMY
July 2023-July 2023 (3 weeks)

- Received 100% Financial Aid

Note: It is still on-going

ACTIVISM ACTIVITIES

MENTORSHIP FOR PROJECTS ADDRESSING TO SOLVE SOCIAL INJUSTICE IN ASIA/OCENIA, PEACE FIRST, Boston, MA
May 2023-June 2023

- Received 1:1 mentorship for my project
- Selected as one of the top 10 projects from their application pool in South East Asia/Oceania
- Opportunity to meet impactful changemakers and learn the process of activism and changemaking from them.

CONFERENCE & ACTIVITIES

NATIONAL IQ TEST
December 2020-December 2020 (1 week)
- Secured 3rd position among 250 high school seniors from top schools in Bangladesh

INTERNATIONAL CONFERENCE FOR LEARNING REPRESENTATION (ICLR), Virtual
May 2021-May 2021 (1 week) – 2 times (2021 & 2022)
- Web testing, monitoring the website & looking for bugs and errors.
- Helping Authors and moderators with video infrastructure software & monitoring chat rooms for code of conduct violation
- Conducting Q&A sessions after Orals with moderators, and helping them to select important questions and forward them.
- Answering questions on technical issues in the helpdesk

INTERNATIONAL CONFERENCE FOR MACHINE LEARNING (ICML), Virtual
July 2021-July 2021 (1 week)
- Conducting 3 Orals as the youngest moderator in ICML history (high school junior)
- Web testing, monitoring the website & looking for bugs and errors.
- Helping Authors and moderators with video infrastructure software & monitoring chat rooms for code of conduct violation
- Conducting Q&A sessions after Orals with moderators, and helping them to select important questions and forward them

CONFERENCE ON NEURAL INFORMATION PROCESSING SYSTEMS (NEURIPS), Virtual
December 2021-December 2021 (1 week)
- Web testing, monitoring the website & looking for bugs and errors.
- Helping Authors and moderators with video infrastructure software & monitoring chat rooms for code of conduct violation
- Conducting Q&A sessions after Orals with moderators, and helping them to select important questions and forward them.

OX-WSDC , THE OXFORD UNION, Oxford, England
April 2021-June 2021
- Selected as one of the 10 independent teams among 100 total selected team for highly prestigious debate competition for high school students
- Competed against sixth forms like Eton College.
- Praised by the judges for gifted logical and reasoning skills.
- Received partial 80% scholarship

HARVARD SCIENCE AND RESEARCH CONFERENCE (HSRC), MA, Cambridge
October 2021-October 2021 (3 days)
- Selected among one of the 250 participants from 1000+ applications as one of the advanced high school students
- Received the chance to learn key academic qualities from Harvard Professors
- Received 100% scholarship

INTERNATIONAL ASTRONOMY AND ASTROPHYSICS COMPETITION (IAAC), Virtual
April 2021 (1 month)
- Received a Bronze award in the competition

FEMTECH BERKELEY 2022
April 2022-April 2022 (1 day)
- Had the opportunity to learn scalability and best software practices from industry experts
- Developed a project using lobe.ai to detect nail styles and tell its name

HARVARD COLLEGE VISION PROGRAM, Cambridge, MA
March 2022-March 2022 (1 week)
One of the 30 students selected from an application pool of 1000s
Learned Medical Leadership and activities
Participated in Case Study
Received 100% scholarship

HARVARD UNICEF CONFERENCE, Cambridge, MA
February 2022-February 2022 (3 days)

- Accepted for the Conference and participated as one of the 30 few individuals
- Participated in Environment and Climate Change Project
- Accepted in both 2022 & 2023 Conferences with 100% scholarship
- In 2023, served as an Ambassador for the Conference

IMMERSIVE ESSAY COMPETITION, UK
January 2022-February 2022

- Accepted into their program with 20% scholarship

HARVARD UNDERGRADUATE INTERNATIONAL RELATIONS SCHOLARS PROGRAM, Cambridge, MA
May 2023-June 2023 (2 months approx.)

- Accepted to Harvard's Prestigious International Relations program as a gap year student
- Considered as one of the best applicants they received in 2023 application pool
- Full scholarship was awarded

PROGRAMMING LANGUAGES

1. Python
    - Primary programming language
    - Advanced level expertise
    - 3+ years of experience developing advanced software, data analysis and artificial intelligence
2. C
    - Secondary programming language
    - Intermediate level expertise
    - 2 years of experience writing algorithms
3. Wolfram Language
    - Favourite functional programming language
    - Intermediate level expertise
    - 6 months of experience writing algorithms, data analysis and artificial intelligence
4. Julia
    - Hobbyist programming language
    - Intermediate experience and can use Julia notebooks
    - 1.5 years of experience performing data analysis
5. LaTeX
    - 2 years of experience in LaTeX by using Texmaker

FRAMEWORKS

1. **DEEP LEARNING FRAMEWORKS**

    - Tensorflow (Advanced level)
    - Pytorch (Intermediate level)
    - Jax (Intermediate level)
    - PyBrain (Intermediate level)

2. **MATHEMATICS & DATA ANALYSIS**

    - Numpy (Advanced level)
    - Pandas (Advanced level)
    - SciPy (Advanced level)
    - Scikit-learn (Advanced level)
    - Matplotlib (Advanced level)

3. **SOFTWARE ENGINEERING/WEB-DEVELOPMENT & DATABASE**

    - Django (Intermediate level)
    - Flask (Advanced level)

4. **QUANTUM COMPUTING & QUANTUM ARTIFICIAL INTELLIGENCE**

    - Qiskit (Advanced level)
    - PennyLane (Advanced level)
    - lambeq (Advanced level)
    - DisCoPy (Advanced level)

GITHUB PROJECTS

WasteNet
- Reverse engineered UK's government's leading waste classification deep learning model.
- It uses a new technique, introduced in the paper i.e. Hybrid Tuning
- Wrote this from scratch using Tensorflow

Wolfram Challenge
- I upload solutions for trending and competitive programming challenges available on Wolfram Challenges in this repo.

Siamese Neural Networks
- From scratch wrote siamese neural networks using triplet functions and cosine distance.
- Trained on Cifar-10 dataset

VQC Algorithm
- Taught myself writing Variational Quantum Circuit through PennyLane
- It helps to tap into the advanced and custom algorithm space in the Quantum field. Most notably, Quantum LSTM Network.

Barren Plateaus
- A phenomenon in variational circuits where the cost function landscape is flat.
- This means that a variational circuit initialised in one of these areas will be untrainable using any gradient-based algorithm.

- Written this in PennyLane

Shallow Quantum Neural Model

- A model inspired on the principles of shallow learning, much like LeNet5
- Written in Pytorch and PennyLane

Superoptimizer

- Read through this wonderful programming concept known as superoptimizer and tried writing it.
- Went through University notes to write this concept.

Note: Kindly, take into consideration, the above mentioned projects are always being updated and sometimes, this list is not relevant to my github profile. Please, refer to my github profile instead and I am shifting towards teaching and advanced projects (few in quantity) to show on my github profile. And most repositories I write are private.

LANGUAGE SKILLS

1. English (Native Speaker + First Language) + (Both speak, read + write)
2. Bengali (Native Speaker) + (Both speak, read + write)
3. Hindi (Native Speaker) + (Only speak)
4. Urdu (Native Speaker) (Only Speak)
5. German (Intermediate Speaker) (Both speak, read + write)
6. Spanish (beginner Speaker) + (Both speak, read + write)

SOFT SKILLS

- Friendly and calm attitude with strong leadership skills. And led about 30 teams in deep learning which consisted of master's and PhD students from Ivy league universities and top universities around the world.
- Expert networking and connecting skills
- Experienced in marketing and promotion. And worked as a salesman for 6 months while in middle school.