

# Muhammad Zain Amin

## PERSONAL INFORMATION

**Email:** Muhammad-Zain\_Amin@etu.u-bourgogne.fr

**Github:** <https://github.com/ZainAmin>

**Personal Website:** <https://zainamin.github.io/>

**Google Scholar:** <https://scholar.google.com/citations?user=f3uZ9NsAAAAJ&hl=en>

## RESEARCH INTERESTS

My research focuses on weakly/semi/self-supervised learning with applications on medical imaging, and computer vision. I am also passionate about applying neuroimaging strategies to prevent and diagnose brain disorders.

## EDUCATION AND TRAINING

### Erasmus Mundus Joint Master Degree in Medical Imaging and Applications (MAIA)

2022 - Present

 **University of Girona (UdG)**

SPAIN

- 30 ECTS in 3rd Semester, supervised by Prof. Robert Martí, and Prof. Arnau Oliver.

 **University of Cassino and Southern Lazio (UNICAS)**

ITALY

- Earned 30 ECTS in 2nd Semester, supervised by Prof. Mario Molinara, Prof. Mario Guarracino, and Prof. Alessandra di Freca.

 **University of Texas Health Science Center (UTHealth)**

USA

- Post 1st Semester Associate Training, supervised by Giancardo Lab of UTHealth.

 **Université de Bourgogne (uB)**

FRANCE

- Earned 30 ECTS in 1st Semester, supervised by Prof. Alain Lalande, Prof. Olivier Laligant, and Prof. Eric Fauvet.

### Bachelor of Science in Computer Science (BSc)

2015 - 2019

 **University of Engineering and Technology Lahore (UET Lahore)**

PAKISTAN

- Supervised by Prof. Amna Yasin, RANK: 4/37, GRADE: 3.50/4.00

## WORK EXPERIENCE

### Italian National Research Council

ITALY

*Graduate Student Researcher*

May 2023 - June 2023

- Supervised by Prof. Mario Rosario Guarracino.
- Researched on the classification of Alzheimer's Disease using MRIs and Gene Expression Data.

### University of Warwick

UNITED KINGDOM

*Visiting Student Fellow*

Sep 2022 - Jan 2023

- Supervised by Prof. Yu Guan, and Prof. Yongjian Hu.
- Researched on exposing DeepFake frames through spectral analysis of colour channels in the frequency domain.

### Wavy AI Research

CHINA

*Machine Learning Researcher*

June 2020 - April 2021

- Researched and implemented lungs X-ray images segmentation using U-Nets.
- Research on methodologies to minimise the impact of batch effects in classification studies using X-ray image datasets.

### United Nations Development Programme (UNDP)

PAKISTAN

*Data Science Coordinator*

Sep 2019 - Nov 2019

- Submitted the measurement of economic goals of healthcare interrelations tailored to Faisalabad.
- Documented over 28 thousand potential relations and ranked them using graph theory methods.

### NFC Institute

PAKISTAN

*Machine Learning Intern*

Jan 2018 - Aug 2019

- Supervised by Prof. Amna Yasin.

- Implemented a machine learning-based healthcare decision making-system for Cesarean Section surgery.

### Google Summer of Code Programme, University of Tokyo

JAPAN

*Student Developer*

April 2016 - Aug 2016

- Worked on a project regarding the prediction of robotics execution failures using erroneous data.

RESEARCH PROJECTS

University of Girona

- MRI and image analysis of human blood flow using deep learning techniques

University of Cassino and Southern Lazio

- Breast mass detection and segmentation using multi-scale morphological sifting and k-means clustering
- Two-step hierarchical classification of skin lesions using transfer learning and machine learning techniques
- Regression analysis challenge based on parametric and non parametric approaches
- Classification challenge on Alzheimer's disease using MRIs and gene expression data (Proposed by Italian National Research Council and UNICAS)

University of Texas Health Science Center

- Image analysis for CTA endovascular stroke therapy

Université de Bourgogne

- Automated detection and diagnosis of diabetic retinopathy
- Detection of Parkinson's disease using automated tunable Q wavelet transform technique with EEG signals
- Comparative analysis of eight direction Sobel Edge Detection algorithm for brain tumor MRI images

HONOURS AND AWARDS

▪ 1st Position, Alzheimer's Disease Classification Challenge Winner by the Italian National Research Council	2023
▪ Erasmus Mundus Scholarship for joint MAIA Master Degree by the European Union (7th out of 869 applicants worldwide)	2022
▪ GREAT Scholarship for Digital Health Master Degree by the UK government and the British Council	2022
▪ Think Big Grant for Health Economics and Policy Analysis Degree by the University of Bristol, UK	2021
▪ Best Graduation Thesis Award during undergraduate studies, 14th graduation projects ceremony	2019
▪ Pakistan's National ICT Research Grant by the Ministry of Information Technology and Telecommunications	2019
▪ High Honors Student for 8 semesters by the dean of UET Lahore Engineering Faculty, Pakistan	2019
▪ Semifinalists in the Pakistan's National ICT Project Exhibition Contest. Featured on National Television News	2019
▪ Teaching Assistant Award by the Department of Computer Science and Engineering, UET Lahore	2018
▪ Best Paper Award at National Conference on AI and Neural Information Processing System, UET Lahore	2018

PUBLICATIONS

BIBLIOMETRICS ( Google Scholar )

Citations: 96	H index: 4	i10-index: 2
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POSTERS

Comparative Analysis of Eight Direction Sobel Edge Detection Algorithm for Brain Tumor MRI Images

Final Presentation on Image Processing, MAIA Medical Imaging and Applications, Université de Bourgogne, France, 2022.

Detection of Parkinson's Disease Using Automated Tunable Q Wavelet Transform Technique with EEG Signals

Final Presentation on Digital Signal Processing, MAIA Medical Imaging and Applications, Université de Bourgogne, France, 2022.

CONFERENCE & TECHNICAL PAPERS

Exposing Deepfake Frames through Spectral Analysis of Color Channels in Frequency Domain

Muhammad Ahmad Amin, Yongjian Hu, Huimin She, Jicheng Li, Yu Guan, Muhammad Zain Amin  
In proceedings of the 11th IEEE International Workshop on Biometrics and Forensics (IWBF), Barcelona, Spain, 2023.

Conversational AI Chatbot Based on Encoder-Decoder Architectures with Attention Mechanism

Amir Ali, Muhammad Zain Amin  
Oral Presentation at National AI Conference, NED University of Engineering and Technology, Karachi, Pakistan, 2019.

Convolutional Neural Network: Text Classification Model for Open Domain Question Answering System

Muhammad Zain Amin, Noman Nadeem  
ArXiv preprint arxiv: 1809.02479, Cornell University, USA, 2018.

Performance Evaluation of Supervised Machine Learning Classifiers for Predicting Healthcare Operational Decisions

Muhammad Zain Amin, Amir Ali  
In proceedings of the National Conference on Artificial Intelligence and Neural Information Processing System (AINIP), University of Engineering and Technology, Lahore, Pakistan, 2017.  
\*Caesarian Section Classification Dataset published in UCI Machine Learning Repository, University of California, Irvine, USA, 2017.

## **Application of Multilayer Perceptron for Data Mining in Healthcare Operations**

**Muhammad Zain Amin**, Amir Ali

Oral presentation at 3rd International Conference on Biotechnology (ICB), University of South Asia, Lahore, Pakistan, 2017.

## **InceptFood: A CNN based Classification Approach for Recognizing Food Images**

**Muhammad Zain Amin**, Amir Ali

In proceedings of National Conference on Emerging Trends in Computing, Statistics and Mathematical Sciences, Peshawar, Pakistan, 2017.

## **TECHNICAL SKILLS**

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**Frameworks** - Tensorflow, Keras, Scikit-Learn, Matplotlib, Numpy, Pandas, OpenCV, Flask

**Programming languages** - Python, C++, Javascript, R

**Online Courses** -

- Applied Data Science (**University of Michigan**).
- Machine Learning (**Stanford University**).
- Neural Networks and Deep Learning (**Andrew Ng**).

## **OPEN DAYS**

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- Attended the MAIA days' thesis and poster presentation sessions and received introductions to the latest medical imaging research activities from MAIA industrial partners, Gaeta, Italy (2023).
- Attended the EIPHI days, and received introductions about research activities, tutoring, mentoring, and doctoral schools at the University Burgundy Franche-Comté in Besançon, France (2022).
- Attended the Project Exhibition Contest "Village de science", Le Creusot, France (2022).

## **SERVICES**

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### **CONFERENCE WORKSHOPS ORGANIZED**

- Adaptive and Multitask Learning Workshop at AINIP Conference (2017).

### **LEADERSHIP AND VOLUNTEERING ACTIVITIES**

- Member of the Erasmus Mundus Association, Brussels, Belgium (2022 - present).
- Senior Member and GREAT Scholar for "Study UK campaign" at the British Council, London, UK (2022 - present).
- Dataset Donor in Life Sciences, UCI Machine Learning Repository, University of California, Irvine, USA (2018 - present).