

# Muhammad Toseef

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RESEARCH INTERESTS	Biomedical Informatics, Large Language Models, Computational Biology, Machine Learning, Data Science	
EDUCATION	City University of Hong Kong, Hong Kong SAR <b>PhD Computer Science</b> , Sep 2020 – Aug 2025 <i>Thesis</i> : Transfer Learning for Mitigating Data Inequalities and Bias in Biomedical Informatics <i>Supervisor</i> : <a href="#">Ka-Chun Wong</a>  South China University of Technology, Guangzhou, China <b>MS Software Engineering</b> , Sep 2018 – Aug 2020 83% – CGPA 3.4 <i>Thesis</i> : A Novel Sentiment Analysis approach based on CPSO-LSTM <i>Supervisor</i> : <a href="#">Qian Tao</a>  University of Bradford, United Kingdom <b>BEng Software Engineering</b> , Sep 2010 – June 2014 2:1 – CGPA 3.7 <i>Thesis</i> : Intelligent Framework for Diagnosis of Crop Diseases using Fuzzy Inference System <i>Supervisor</i> : <a href="#">Malik Jahan Khan</a>	
EMPLOYMENT AND ACADEMIC POSITIONS	<b>Harvard Medical School – Brigham and Women’s Hospital, Boston, MA, USA</b> <i>Visiting Research Trainee</i> <b>December, 2023 - June, 2024</b>  <ul style="list-style-type: none"><li>• Worked under the supervision of <a href="#">Martin Hemberg</a>, for the analysis of spatial transcriptomics (ST) datasets such as NanoString, 10x Visium.</li><li>• Studied and analyzed the perineural invasion (PNI) (cancer malignant cells and nerve cells interaction) for PDAC patients.</li></ul> <b>Department of Computer Science – City University of Hong Kong, Hong Kong SAR</b> <i>Teaching Assistant</i> <b>January, 2021 - Aug 2024</b>  Undergraduate and postgraduate level courses  <ul style="list-style-type: none"><li>• CS3422 Software Design – Spring 2023, Spring 2022, Spring 2021</li><li>• CS4480 Data-Intensive Computing – Fall 2022, Fall 2021</li><li>• CS5488 Big Data Algorithms and Techniques – Fall 2022, Fall 2021</li></ul> <b>Department of Computer Science – Namal University, Mianwali, Pakistan</b> <i>Senior Software Engineer</i> <b>February, 2017 - January, 2018</b>  <ul style="list-style-type: none"><li>• Worked on an intelligent disease diagnosis system for livestock in rural Pakistan.</li><li>• Easy-to-use localized web and Android-based applications to timely diagnose livestock diseases.</li><li>• Leveraged hybrid fuzzy-Case Based Reasoning (fuzzy-CBR) technique for inferences.</li></ul>	

Department of Computer Science and Information Technology – University Of Sargodha, Pakistan

Visiting Faculty

February, 2016 - June, 2016

Taught Software Engineering and Information Systems, and other departmental duties.

Department of Computer Science – Namal University, Mianwali, Pakistan

Research Associate

July, 2014 - March, 2016

1. *Optimized crop distribution for enhanced productivity*
  - developed an Android application in English and Urdu language to help the rural farmer communities using Linear Programming (LP).
2. *Disease diagnosis system of crop using Fuzzy Inference System*
  - developed an Android app for disease diagnosis using English and Urdu Language for the crop disease diagnosis using Fuzzy Fuzzy Inference System in MATLAB.

Namal University, Mianwali, Department of Computer Science

Intern Research Assistant

June, 2013 - May, 2014

PUBLICATIONS  
(SORTED BY RELEVANCE)

- **Muhammad Toseef**, Li, X., & Wong, K. C. (2022). Reducing healthcare disparities using multiple multiethnic data distributions with fine-tuning of transfer learning. *Briefings in Bioinformatics*, 23(3), bbac078.
- **Muhammad Toseef**, Olayemi Petinrin, O., Wang, F., Rahaman, S., Liu, Z., Li, X., & Wong, K. C. (2023). Deep transfer learning for clinical decision-making based on high-throughput data: comprehensive survey with benchmark results. *Briefings in Bioinformatics*, bbad254.
- **Muhammad Toseef**, Malik Jahan Khan, Saifur Rahaman, Atta Ullah, Olutomi-layo Olayemi Petinrin, Xiangtao Li, Ka-Chun Wong, "Addressing Capture Bias in Tomato Disease Classification with Deep Transfer Learning", accepted in ICONIP, 2025.
- **Muhammad Toseef**, Olutomilayo Olayemi Petinrin, Xiangtao Li, Ka-Chun Wong (2024), "Malignant cell annotations via domain generalization for brain cancer spatial transcriptomics", *The International Conference on Neural Information Processing (ICONIP)*, 2024.
- Fuzhou Wang, Tingxiao Gao, Jiecong Lin, Zetian Zheng, Lei Huang, **Muhammad Toseef**, Xiangtao Li, and Ka-Chun Wong. "GILoop: robust chromatin loop calling across multiple sequencing depths on Hi-C data." *iScience* (2022): 105535.
- Rahaman, Saifur, Peter Wang, Jun Yu, Tania Rahman, **Muhammad Toseef**, Ibrahim Mohammed Sayem, Xiangtao Li, and Ka-Chun Wong. "Precision oncology informatics for anti-cancer drug combination responses: A systematic review." *Computers in Biology and Medicine* 196 (2025): 110788.
- Petinrin, O. O., Saeed, F., **Muhammad Toseef**, Liu, Z., Basurra, S., Muyide, I. O., Li, X & Wong, K. C. (2023). Machine Learning in Metastatic Cancer Research: Potentials, Possibilities, and Prospects. *Computational and Structural Biotechnology Journal*.
- Liu, Z., Petinrin, O. O., **Muhammad Toseef**, Chen, N., & Wong, K. C. (2023). Construction of Immune Infiltration-Related LncRNA Signatures Based on Machine Learning for the Prognosis in Colon Cancer. *Biochemical Genetics*, 1-28.
- Petinrin, O. O., Saeed, F., Salim, N., **Muhammad Toseef**, Liu, Z., & Muyide, I. O. (2023). Dimension Reduction and Classifier-Based Feature Selection for Oversampled Gene Expression Data and Cancer Classification. *Processes*, 11(7), 1940.
- Solyman, A., Zhenyu, W., Qian, T., Elhag, A. A. **Muhammad Toseef**, and Aleibeid, Z. (2021). Synthetic data with neural machine translation for automatic correction in Arabic grammar. *Egyptian Informatics Journal*, 22(3), 303-315.
- **Muhammad Toseef** and Khan, M. J. (2018). An intelligent mobile application for diagnosis of crop diseases in Pakistan using fuzzy inference system. *Computers and Electronics in Agriculture*, 153, 1-11

- **Muhammad Toseef**, Malik Jahan Khan, Saifur Rahaman, Atta Ullah, Olutomilayo Olayemi Petinrin, Xiangtao Li, Ka-Chun Wong, "Addressing Capture Bias in Tomato Disease Classification with Deep Transfer Learning", *ICONIP*, 2025.

TECHNICAL SKILLS

- **Programming Languages:** Python, R, Java
- **Tools:** Slurm, Hadoop, Weka, UML Tools
- **Operating Systems:** Linux, macOS, Windows

PROFESSIONAL SERVICES

**Review Service**

- Computational and Structural Biotechnology Journal
- Heliyon
- BioData Mining
- PeerJ Computer Science
- IEEE BigData Conference (2022)
- International Conference on Intelligent Systems, Metaheuristics & Swarm Intelligence (ISMSI 2021, ISMSI 2020)

SCHOLARSHIPS / AWARDS

- 4 years UGC funded studentship for PhD degree at City University of Hong Kong
- 4 years merit scholarship at Namal University Mianwali Pakistan
- PEEF (Government of Punjab, Pakistan) Scholarship at SSC level

REFERENCE

**Martin Hemberg, PhD**  
Associate Professor of Immunology  
GeneLay Institute of Immunology and Inflammation  
Harvard Medical School and Brigham and Women's Hospital  
mhemberg@bwh.harvard.edu

**Malik Jahan Khan, PhD**  
Associate Professor  
Lahore University of Management Sciences  
jahan@lums.edu.pk

**Shahid Hussain, PhD**  
Assistant Professor  
Penn State Behrend  
sjh6561@psu.edu