



## EMPLOYEE PROFILE

DEPARTMENT OF COMPUTER SCIENCE  
GOVERNMENT COLLEGE UNIVERSITY  
LAHORE



### **Dr. Muhammad Waqas Anwar**

Chairperson / Professor, Computer Science

#### **Area of Interest:**

- Natural Language Processing
- Computational Linguistics

**Tel # (Off):**

**HEC approved PhD Supervisor**

I, Dr. Muhammad Waqas Anwar is currently working as Chairperson /Associate Professor in the department of computer science, Government College University Lahore. I graduated from Hamdard University in 2001 and joined CUI as Lecturer in 2002. After 2.5 years, I proceeded for PhD from Harbin Institute of Technology. P.R.China and accomplished my research work in the field of Artificial Intelligence and specifically Natural Language Processing.

### **Publications:**

#### **Book Chapters:**

1. S. Naz, M. I. Razzak, K. Hayat, Waqas Anwar, S. Z. Khan (2014), "Challenges in Baseline Detection of Arabic Script Based Languages", Intelligent Systems for Science and Information Studies in Computational Intelligence, edited by: Liming Chen, Supriya Kapoor, Rahul Bhatia, published by: Springer, pp: 181-196, Standard: 978-3-319-04701-0

#### **Journal Papers:**

1. R. Rehan, U.I.Bajwa, Y. Mehmood, Waqas Anwar, M.H. Jamal (2022), "dResU-Net: 3D deep residual U-Net based brain tumor segmentation from multimodal MRI", Biomedical Signal Processing and Control, DOI: <https://doi.org/10.1016/j.bspc.2022.103861>, Impact Factor: 5.076
2. G. Gilanie, U.I. Bajwa, M.M. Waraich, Muhammad Waqas Anwar, H.Ullah (2022), "An automated and risk free WHO grading of glioma from MRI images using CNN", Multimedia Tools and Applications, DOI: <https://doi.org/10.1007/s11042-022-13415-9>, Impact Factor: 2.757
3. Waqas Ahmed, U.I.Bajwa, Waqas Anwar, M. Sajid (2022), "Reduced Complexity and Optimized Face Recognition Approach based on Facial Symmetry", Journal of Real-Time Image Processing, pp: 809–822, Vol: 19, DOI: <https://doi.org/10.1007/s11554-022-01224-0>, Impact Factor: 2.358
4. J. Iqbal, U. I.Bajwa, G. Gilanie, A. Iftikhar, Waqas Anwar (2022), "Automatic brain tumor segmentation from magnetic resonance images using superpixel-based approach",

	Multimedia Tools and Applications, DOI: <a href="https://doi.org/10.1007/s11042-022-13166-7">https://doi.org/10.1007/s11042-022-13166-7</a> , Impact Factor: 2.757
5.	T. FATIMA, RAEES UL ISLAM, WAWAS ANWAR, M. H. JAMAL, M. T. CHAUDHRY, Z. GILLANI, (2022), "STEMUR: An Automated Word Conflation Algorithm for the Urdu Language", ACM Transactions on Asian and Low-Resource Language Information Processing (TALLIP), pp: 1-20, Vol: 21, Issue: 2, DOI: <a href="https://doi.org/10.1145/3476226">https://doi.org/10.1145/3476226</a> , Impact Factor: 1.413
6.	S. Riaz, Muhammad Waqas Anwar, I. Riaz (2021), "Multiscale Image Dehazing and Restoration: An Application for Visual Surveillance", Computers, Materials & Continua, Impact Factor: 3.772
7.	Romila Aziz, Muhammad Waqas Anwar, M. H. Jamal, U. I. Bajwa (2021), "A hybrid model for spelling error detection and correction for Urdu language", Neural Computing and Applications, pp: 14707–14721, Vol: 33, DOI: <a href="https://doi.org/10.1007/s00521-021-06110-7">https://doi.org/10.1007/s00521-021-06110-7</a> , Impact Factor: 5.606
8.	Muhammad Mushtaq , Rizwan ul Haq , Waqas Anwar (2021), "A computational study of suppression of sharp wave ripple complexes by controlling calcium and gap junctions in pyramidal cells", BIOENGINEERED, pp: 2603–2615, Vol: 12, Issue: 1, ISSN: 2165-5987, DOI: <a href="https://doi.org/10.1080/21655979.2021.1936894">https://doi.org/10.1080/21655979.2021.1936894</a> , Impact Factor: 3.269
9.	Haseeb Younis, Muhammad Waqas Anwar, Muhammad U. G. Khan, A. Sikandar, U.I.Bajwa (2021), "A New Sequential Forward Feature Selection (SFFS) Algorithm for Mining Best Topological and Biological Features to Predict Protein Complexes from Protein–Protein Interaction Networks (PPINs)", Interdiscip Sci Comput Life Sci, DOI: <a href="https://doi.org/10.1007/s12539-021-00433-8">https://doi.org/10.1007/s12539-021-00433-8</a> , Impact Factor: 2.233
10.	R.Maqqood, U.I.Bajwa, G. Saleem, R. H. Raza, Muhammad Waqas Anwar (2021), "Anomaly recognition from surveillance videos using 3D convolution neural network", Multimedia Tools Applications, ISSN: 1573-7721, Impact Factor: 2.757
11.	Rafiq, M., Bajwa, U.I., Gilanie, G, Muhammad Waqas Anwar (2021), "Reconstruction of scene using corneal reflection", Multimedia Tools Applications, ISSN: 1380-7501, Impact Factor: 2.757
12.	Samia Riaz, Muhammad Waqas Anwar, I. Riaz, Y. Nam, M.A. Khan (2021), "Visibility Restoration Using Generalized Haze-Lines", Information Technology and Control, pp: 188-207, Vol: 50, Issue: 1, Standard: 1392-124X, Impact Factor: 0.905
13.	G. Gilanie, U.I. Bajwa, M. M. Waraich, Muhammad Waqas Anwar (2021), "Risk-free WHO grading of astrocytoma using convolutional neural networks from MRI images", Multimedia Tools Applications, pp: 4295–4306, Vol: 80, DOI: <a href="https://doi.org/10.1007/s11042-020-09970-8">https://doi.org/10.1007/s11042-020-09970-8</a> , Impact Factor: 2.757
14.	S. Alam, U.I.Bajwa, N. Haq, N. Ratyal Waqas Anwar (2020), "Skin Disease Classification using Neural Network", Current Medical Imaging, pp: 711-719, Vol: 16, Issue: 6, ISSN: 1573-4056, DOI: 10.2174/1573405615666190422152926, Impact Factor: 0.812
15.	Misba Sikarndar ; Waqas Anwar ; A. Almogren, Ikram Ud Din, N.Guizani (2020), "IoMT-Based Association Rule Mining for the Prediction of Human Protein Complexes", IEEE Access, pp: 6226 - 6237, Vol: 8, Standard: 2169-3536, Impact Factor: 3.745
16.	M.T.Chaudhary. M. H. Jamal. Waqas Anwar, M. Salman (2020), "Thermal-benchmarking for cloud hosting green data centers", Sustainable Computing: Informatics and Systems, Vol: 25, Impact Factor: 2.798
17.	A.Sikandar, Waqas Anwar, M.Sikandar (2019), "Combining Sequence Entropy and Subgraph Topology for Complex Prediction in Protein Protein Interaction (PPI)

	Network", Current Bioinformatics, pp: 516-523, Vol: 14, Issue: 6, ISSN: 1574-8936, DOI: <a href="https://doi.org/10.2174/1574893614666190103100026">https://doi.org/10.2174/1574893614666190103100026</a> , Impact Factor: 1.198
18.	N. Khan, Waqas Anwar, U. I. Bajwa, F.Ahmad (2019), "Statistical machine translation of Indian languages: a survey", Journal of Neural Computing and Applications, pp: 2455–2467, Issue: 31, ISSN: 0941-0643, DOI: <a href="https://doi.org/10.1007/s00521-017-3206-2">https://doi.org/10.1007/s00521-017-3206-2</a> , Impact Factor: 4.213
19.	R. Irfan, Z. Rehman, A. Abro, Camelia Chira , Waqas Anwar (2019), "Ontology Learning in Text Mining for Handling Big Data in Healthcare Systems", Journal of Medical Imaging and Health Informatics, pp: 649-661, Vol: 9, Issue: 4, ISSN: 2156-7018, DOI: <a href="https://doi.org/10.1166/jmihi.2019.2681">https://doi.org/10.1166/jmihi.2019.2681</a> , Impact Factor: 0.659
20.	A.Sikandar ; Waqas Anwar ; U.I.Bajwa ; X.Wang, M.Sikandar (2018), "Decision Tree Based Approaches for Detecting Protein Complex in Protein Protein Interaction Network (PPI) via Link and Sequence Analysis", IEEE Access, pp: 22108-22120, Vol: 6, ISSN: 1531-1309, DOI: 10.1109/ACCESS.2018.2807811, Impact Factor: 3.557
21.	U.I. B, A.A.Shah, Waqas Anwar, (2018), "Computer-Aided Detection (CADe) System for Detection of Malignant Lung Nodules in CT Slices - a Key for Early Lung Cancer Detection", Current Medical Imaging Reviews, pp: 422-429, Vol: 14, Issue: 3, Standard: 1573-4056, Impact Factor: 1.059
22.	Muhammad A.H.N., M.Majdinasab,U.Latif, M.Nasir, G.Gokce, Waqas Anwar. A.Hayat (2018), "Development of a disposable electrochemical sensor for detection of cholesterol using differential pulse voltammetry", Journal of Pharmaceutical and Biomedical Analysis, pp: 398-405, Vol: 159, Standard: 0731-7085, Impact Factor: 2.831
23.	S. Raj, Z. Rehman, S. Rauf, R. Siddique, Waqas Anwar (2015), "An Artificial Neural Network Approach for Sentence Boundary Disambiguation in Urdu Language Text", The International Arab Journal of Information Technology, pp: 395-400, Vol: 12, Issue: 4, Standard: 1683-3198, Impact Factor: 0.582
24.	Lin Yao, Hong Liu, Yi Liu, Xinxin Li, Waqas Anwar (2015), "Biomedical Named Entity Recognition based on Deep Neutral Network", International Journal of Hybrid Information Technology, pp: 279-288 , Vol: 8, Issue: 8, Standard: 1738-9968
25.	E.U.Munir, S.Ijaz, S. Ahmad, A.N. Khan, Waqas Anwar (2015), "Novel Approaches for Scheduling Task Graphs in Heterogeneous Distributed Computing Environment", The International Arab Journal of Information Technology, pp: 270-277, Vol: 12, Issue: 3, Standard: 1683-3198, Impact Factor: 0.582
26.	Salah-ud-Din Ayubi, U.I.Bajwa, Waqas Anwar (2015), "Super-Resolution Based Enhancement of Cardiac MR Images", Current Medical Imaging Reviews,, pp: 105-113, Vol: 11, Issue: 2, Standard: 1573-4056, Impact Factor: 1.059
27.	S.A.Khan, Waqas Anwar, U.I.Bajwa, X. Wang (2015), "Template Based Affix Stemmer for a Morphologically Rich Language", The International Arab Journal of Information Technology, pp: 146-154, Vol: 12, Issue: 2, Standard: 1683-3198, Impact Factor: 0.582
28.	Zili Zhang, Xuan Wang, Waqas Anwar, and Zoe L. Jiang (2014), "A Comparison of Moments-based Logo Recognition Methods", Abstract and Applied Analysis, Vol: 2014, Issue: Article ID 854516, Standard: 1085-3375, Impact Factor: 1.274
29.	A. Sadiq, F.Ahmad, S.A. Khan, J.Carlos, T. Naz, Waqas Anwar (2014), "Modeling and analysis of departure routine in Air Traffic Control based on Petri Net", Journal of Neural Computing and Applications, pp: 1099-1109, Vol: 25, Issue: 5, Standard: 0941-0643, Impact Factor: 1.763
30.	S. Naz, K. Hayat, M.I. Razzak, Waqas Anwar, S. A. Madani, S. U. Khan (2014), "The Optical Character Recognition of Urdu-like Cursive Scripts", Pattern Recognition, pp: 1229-1248, Vol: 47, Issue: 3, Standard: 0031-3203, Impact Factor: 2.632

31.	U.I.Bajwa, I.A.Taj, Waqas Anwar, X. Wang (2013), "A Multifaceted Independent Performance Analysis of Facial Subspace Recognition Algorithms", PLoS ONE, pp: e56510, Vol: 8, Issue: 2, Standard: 1932-6203, Impact Factor: 4.092
32.	.Ijaz, E.U.Munir, Waqas Anwar, W.Nisar (2013), "Efficient Scheduling Strategy for Task Graphs in Heterogeneous Computing Environment", The International Arab Journal of Information Technology, pp: 486-492, Vol: 10, Issue: 5, Standard: 1683-3198, Impact Factor: 0.39
33.	Zobia Rehman, Waqas Anwar, U.I.Bajwa, X. Wang (2013), "Morpheme Matching Based Text Tokenization for a Scarce Resourced Language", PLoS ONE, pp: e68178, Vol: 8, Issue: 8, Standard: 1932-6203, Impact Factor: 4.092
34.	L. Xinxin, X. Wang, Waqas Anwar (2013), "Simple Semi-supervised Learning for Chinese Word Segmentation and Pos Tagging", Information Technology Journal, pp: 5955-5961, Vol: 12, Issue: 20
35.	U.I.Bajwa, I.A.Taj, Waqas Anwar (2012), "A Unified Classifier for Robust Face Recognition Based on Combining Multiple Subspace Algorithms", Optics Communications, pp: 4324-2332, Vol: 285, Issue: 21-22, Standard: 0030-4018, Impact Factor: 1.486
36.	Zobia Rehman, Waqas Anwar (2012), "Hybrid Approach for Urdu Sentence Boundary Disambiguation", The International Arab Journal of Information Technology, pp: 250-255, Vol: 9, Issue: 3, Standard: 1683-3198, Impact Factor: 0.582

#### Conference Papers:

1.	Shahid Iqbal, M.U.S.Khan, Waqas Anwar (2020) "English to Urdu: Optimizing Sequence Learning in Neural Machine Translation", 3rd International Conference on Computing, Mathematics and Engineering Technologies (iCoMET), Standard: 978-1-7281-4970-7
2.	Fatima Riaz ; Muhammad Waqas Anwar ; H.Muqades (2020) "Maximum Entropy based Urdu Named Entity Recognition ", International Conference on Engineering and Emerging Technologies (ICEET), Standard: 978-1-7281-4581-5
3.	Usman Mohy Ud Din, Waqas Anwar and G. A. Mallah (2020) "Maximum Entropy Based Urdu Part of Speech Tagging", International Conference on Intelligent Technologies and Applications, Standard: 978-981-15-5231-1
4.	S. Rani, Waqas Anwar (2020) "Resource Creation and Evaluation of Aspect Based Sentiment Analysis in Urdu", Proceedings of the 1st Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics and the 10th International Joint Conference on Natural Language Processing: Student Research Workshop
5.	Tayyaba Fatima, Raees Ul Islam, Muhammad Waqas Anwar (2018) "Morphological and Orthographic Challenges in Urdu Language Processing: A Review", 11th edition of the Language Resources and Evaluation Conference, pp: 44-51, Standard: 979-10-95546-24-5
6.	F. Ahmad, A. Sadiq, A. M. M. Enríquez, A. Muhammad, Waqas Anwar, U.I Bajwa, M. Naseer (2017) "Component Based Architecture for the Control of Crossing Regions in Railway Networks", 16th IEEE International Conference on Machine Learning and Applications, pp: 540-545, Standard: 978-1-5386-1419-8
7.	Sabahat Mir, Safdar Zaman, Muhammad Waqas Anwar (2015) "Printed Urdu Nastalique Script Recognition Using Analytical Approach", 13th International Conference on Frontiers of Information Technology, pp: 334-340, Standard: 978-1-4673-9666-0
8.	S.Naz, K.Hayat, M.I.Razzak, Waqas Anwar, H. Akbar (2013) "Arabic script based character segmentation: A review", 2013 World Congress on Computer and Information Technology, pp: 1-7, Standard: 978-1-4799-0462-4

9.	S.Naz, K.Hayat, M.I.Razzak, Waqas Anwar, H. Akbar (2013) "Arabic script based language character recognition: Nasta'liq vs Naskh analysis", 2013 World Congress on Computer and Information Technology (WCCIT), pp: 1-7, Standard: 978-1-4799-0462-4
10.	S.Naz, K.Hayat, M.I.Razzak, Waqas Anwar, H. Akbar (2013) "Challenges in Baseline Detection of Cursive Script Languages", Science and Information (SAI) Conference
11.	N Khan, Waqas Anwar, U.I Bajwa, N. Durrani (2013) "English to Urdu Hierarchical Phrase-based Statistical Machine Translation", Proceedings of the IJCNLP-13 Workshop on South and Southeast Asian Natural Language Processing, pp: 72-76
12.	S. Iqbal, Waqas Anwar, U.I. Bajwa, Z. Rehman (2013) "Urdu Spell Checking: Reverse Edit Distance Approach", Proceedings of the IJCNLP-13 Workshop on South and Southeast Asian Natural Language Processing (WSSANLP), Vol: 58-65
13.	S.A.Khan, Waqas Anwar, U.I.Bajwa, X. Wang (2012) "A Light Weight Stemmer for Urdu Language: A Scarce Resourced Language", Proceedings of the COLING-12, 3rd Workshop on South and Southeast Asian Natural Language Processing (WSSANLP), pp: 69-78
14.	F. Jahangir, Waqas Anwar, U.I.Bajwa, X. Wang (2012) "N-gram and Gazetteer List Based Named Entity Recognition for Urdu: A Scarce Resourced Language", Proceedings of the COLING-12, 10th Workshop on Asian Language Resources (ALR)
15.	Z. Zhang, X. Wang, Waqas Anwar, U.I,Bajwa (2012) "Two Problems of Circle in Image", 10th International Conference on Frontiers of Information Technology, pp: 91-95
16.	Sajjad A.Khan, Waqas Anwar,U.I.Bajwa (2011) "Challenges in Developing a Rule based Urdu Stemmer", Proceedings of the IJCNLP-11 Workshop on South and Southeast Asian Natural Language Processing (WSSANLP), pp: 46-51
17.	Zobia Rehman, Waqas Anwar, U.I.Bajwa (2011) "Challenges in Urdu Text Tokenization and Sentence Boundary Disambiguation", Proceedings of the IJCNLP-11 Workshop on South and Southeast Asian Natural Language Processing (WSSANLP), pp: 40-45
18.	F. Ahmad, Hejiao Huang, Wang Xiao-long,Waqas Anwar (2008) "A Technique for Generating the Reduces Reachability Graph of Petri Net Models", International Conference on Systems, Man, and Cybernetics
19.	Waqas Anwar, Xuan Wang, Lu Li, Xiao-long Wang (2007) "A Statistical Based Part-of-Speech tagger for Urdu Language", International Conference on Machine Learning and Cybernetics, Standard: 978-1-4244-0972-3
20.	Xuan Wang, Lu-Li, Lin Yao, Waqas Anwar (2006) "A Maximum Entropy Approach to Chinese Pin Yin-To-Character Conversion", IEEE International Conference on Systems, Man and Cybernetics, Standard: 1-4244-0099-6

## Qualification:

*Ph.D.*

Harbin Institute of Technology, P.R.China

*2004 to 2008*

## Experience:

Associate Professor/Head of Department  
Department of Computer Science Government College University Lahore  
May 2023 to Date



Associate Professor/Head of Department COMSATS University Islamabad, Lahore Campus Mar 2021 to 2023
Associate Professor COMSATS University Islamabad, Lahore Campus 2016 to 2021
Associate Professor/Head of Department COMSATS Institute of Information Technology 2013 to 2016
Associate Professor COMSATS Institute of Information Technology 2012 to 2013
Assistant Professor COMSATS Institute of Information Technology 2008 to 2012
Lecturer COMSATS Institute of Information Technology 2002 to 2008