**Sumbel Ijaz (ELECT/30547)**

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**ORCID ID:** 0000-0003-1266-5838

**Experience**

**Lecturer Government College University (GCU), Lahore – Pakistan**

Served as a **faculty member** at (Electrical) Engineering Department between May 2012 and September 2019; Primary responsibilities included **UG teaching** and **supervising UG Final-Year Projects**;

**Lab Engineer/ University of Management & Technology (UMT), Lahore – Pakistan**

**Lecturer** Served as a **faculty member** at Electrical Engineering Department during (February 2011 – May 2012)

**Controls Engineer Energy Systems (Pvt.) Ltd., Lahore – Pakistan** (Aug. 2010 – Feb. 2011)

**Education**

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| --- | --- | --- | --- |
| **Qualification** | **Tenure/ Year of Passing** | **Institution** | **CGPA/ %age** |
| **Ph. D. Electrical Engineering** | 2025 | Information Technology University, Lahore – Pakistan | **3.89**/ 4.0 |
| **M. Sc.** **Electrical Engineering** | 2017 | University of Engineering & Technology, Lahore – Pakistan | **3.76**/ 4.0 |
| **B. Sc. Electrical Engineering** | 2006 – 2010 | University of Engineering & Technology, Lahore – Pakistan | **3.64**/ 4.0 |
| Higher Secondary School Certificate | 2004 – 2006 | Board of Intermediate & Secondary Education, Lahore – Pakistan | **85%** |
| Secondary School Certificate | 2002 – 2004 | Board of Intermediate & Secondary Education, Lahore – Pakistan | **77.2%** |

**Research Work/ Interests**

***Ph. D. Thesis* Design and Development of Efficient Nanostructured Metamaterials for Next Generation Thermophotovoltaics**

**M. Sc. Thesis Indoor Photovoltaic System Design & Modeling**

Modeled and simulated the working of an IPVS using OptiSystem®

**B. Sc. IP Multimedia Subsystems Implementation**

**Research Publications**

1. **S Ijaz**, D. Kang, A.S. Rana, J. Kim, M.T. Saeed Chani, M. Zubair, Q. H Abbassi, M.Q. Mehmood, J. Rho “Metasurface Absorber–Emitter Pair-Integrated High-Efficiency Thermophotovoltaic System”. *ACS Photonics*, July 3, 2025
2. **S. Ijaz**, E. Raza, Z. Ahmed, M. Zubair, M.Q. Mehmood, H. Mehmood, Y. Massoud and M. M. Rehman, “Numerical simulation to optimize the efficiency of HTM-free perovskite solar cells by ETM engineering.” *Solar Energy*, vol. 250, pp. 108-118, 2023
3. **S. Ijaz**, M.Q. Mehmood, H. Cabrera, M. Zubair, Y. Massoud, “Ultra-broadband UV–VIS–NIR absorbers via nanostructured refractory nitrides.” *MRS Energy & Sustainability,* Pages 1-17, 2024
4. **S. Ijaz**, A. S. Rana, Z. Ahmed, B. Rehman, M. Zubair and M.Q. Mehmood, “Exploiting zirconium nitride for an efficient heat-resistant absorber and emitter pair for solar thermophotovoltaic systems.” *Optics Express*, vol. 29, pp. 31537-31548, 2021.
5. **S. Ijaz**, A. S. Rana, Z. Ahmed, M. Zubair, Y. Massoud, and M.Q. Mehmood, “The Dawn of Metadevices: From Contemporary Designs to Exotic Applications.” *Advanced Devices & Instrumentation,* vol. 2022, 2022.
6. **S. Ijaz**, M. Q. Mehmood, Z. Ahmed, K. A Aljaloud, A. H Alqahtani, Y. Al-Adidi, R. Hussain, “Efficient Solar energy harvesting via thermally stable tungsten-based nanostructured solar thermophotovoltaic systems.” *Materials Today Communications*, Pages 109967, 2024
7. **S. Ijaz**, S. Noureen, B. Rehman, M. Zubair, Y. Massoud, M. Q. Mehmood, “Multi-Material Described Metasurface Solar Absorber Design with Absorption Prediction Using Machine Learning Models.” *Materials Today Communications*, Pages 106377, 2023
8. **S. Ijaz,** S. Noureen, B. Rehman, M. Zubair, M. Q. Mehmood, Y. Massoud, "A Machine Learning-based Approach to Model Highly-thermally Robust Metasurface Absorber," *Proceedings of the 2022 Conference on Lasers and Electro-Optics Pacific Rim, (31 Aug, 2022)*
9. **S. Ijaz,** A.S. Rana, M. Zubair, and M. Q. Mehmood, "Investigating sunlight trapping efficiency of an ultrathin, ultrabroadband, thermostable, zirconium nitride (ZrN)-based metasurface for solar thermophotovoltaic systems," *Proceedings Volume 12150, Photonics for Solar Energy Systems IX; 1215007 SPIE Photonics Europe, (24 May 2022),* [*https://doi.org/10.1117/12.2615502*](https://doi.org/10.1117/12.2615502)*.*
10. **S. Ijaz**, A. Zulfiqar, B. Rehman, Q.H. Abbasi, M Zubair, M. Q. Mehmood, “Machine learning for metasurfaces broadband absorber design”, *Proceedings Volume 13011, Data Science for Photonics and Biophotonics;* *SPIE Photonics Europe, 2024,* [*https://doi.org/10.1117/12.3022094*](https://doi.org/10.1117/12.3022094)
11. **S. Ijaz,** S. Noureen, B. Rehman, M. Zubair, M. Q. Mehmood, Y. Massoud, "Application of machine-learning techniques for characteristic analysis of refractory materials," *Proceedings Volume 12313, Photonics for Energy II; 1231307 SPIE/COS Photonics Asia (16 Dec, 2022)* [*https://doi.org/10.1117/12.2643946*](https://doi.org/10.1117/12.2643946).
12. **S. Ijaz**, A.S. Rana, M. Zubair, and M. Q. Mehmood, "Evaluating the most efficient 2D ZrN nanostructures for broadband metasurface absorbers," *Proceedings Volume 12004, Integrated Optics: Devices, Materials, and Technologies XXVI; 120040T SPIE OPTO, (5 March 2022),* [*https://doi.org/10.1117/12.2607885*](https://doi.org/10.1117/12.2607885)*.*
13. **S. Ijaz,** A.S. Rana, M. Zubair, and M. Q. Mehmood, "Ultra-black Pythagorean-tree metasurface antenna array based absorber and emitter for applications in solar thermophotovoltaics," *1st International Conference on Microwave, Antennas & Circuits (ICMAC)*, pp. 1-4, 2021.
14. S. Noureen, I.H. Syed, **S. Ijaz**, A. A. Abdellatif, H. Cabrera, M. Zubair, Y. Massoud d, M. Q. Mehmood “Physics-driven tandem inverse design neural network for efficient optimization of UV–Vis meta-devices.” *Applied surface science advances*, 18 (2023) 100503

**Skills**

**Programing Tools:** Python and MATLAB

**Simulation & Design Tools:** CST, Lumerical, AutoCad, SCAPS, PVSyst, Xilinx, Proteus

**Office Tools:** MS-Word, MS-Excel, MS-Power point, MS-Publisher