Dr. Sajid Muhaimin Choudhury

Associate Professor, Department of EEE, BUET

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Brief Biography

Dr. Sajid Choudhury is working as an Associate Professor in the Department of EEE, BUET. Dr. Choudhury completed his Ph.D. from the School of Electrical and Computer Engineering in Purdue University. Dr. Choudhury had the privilege of acquiring skills of both experimental and numerical approaches to solve problems related to photonics. His current research interest is in Photonic Quantum Computing, Flat Optics with Metasurface, Photonic Devices with Phase Change Materials, Embedded Systems Design. He seeks to solve fundamental and high-impact research questions of photonics and quantum computing, as well as to design practical solutions to meet the needs of Bangladesh. Dr. Choudhury is a member of the Department of EEE, BUET Self Assessment Committee, seeking to improve and excel the educational quality of the department. He actively engages and volunteers in Professional societies. Dr. Choudhury is the Educational Activities Chair of IEEE Bangladesh Section, Chair, IEEE Photonics Society Bangladesh Chapter and founding President, The Optica Bangladesh Section. Dr. Choudhury is a senior member of the IEEE and member of Optica. He is a member of the National Young Academy of Bangladesh (NYAB).

Education

Ph.D. — **Purdue University**, West Lafayette, IN, USA — Aug 2013 – Aug 2019
School of Electrical and Computer Engineering

- **Ph.D. Thesis:** WAVEFRONT MANIPULATION WITH META-SURFACES BASED ON NEW MATERIALS
- **Ph.D. Co-supervisor(s):** Alexandra Boltasseva and Alexander Kildishev

M.Sc. — **Bangladesh University of Engineeing and Technology (BUET)** — Aug 2011 – 2013
Department of Electrical and Electronic Engineering

- **M.Sc. Engg. Thesis:** Design of a Fractal Antenna based on Hexaflake Fractal Structure
- **M.Sc. Engg. Supervisor:** Dr. M. A. Matin

B.Sc. — **Bangladesh University of Engineeing and Technology (BUET)** — Dec 2004 – Aug 2010
Department of Electrical and Electronic Engineering

- CGPA: 3.94/4.0
- **Undergraduate Thesis:** Design and Analysis of a Multiband Dual Feed Axially Symmetric Cassegrain Antenna System
- **Undergraduate Supervisor:** Dr. M. A. Matin

H.S.C. — **Notre Dame College**, Dhaka — 2004

- GPA: 5.00/5.00

S.S.C. — **Udayan Uchchya Madhyamic Bidyalaya**, Dhaka — 2002

- GPA: 5.00/5.00

Experience

Associate Professor, Department of Electrical and Electronic Engineering (EEE) — July 2022 – to date
Bangladesh University of Engineering and Technology (BUET)

Assistant Professor, Department of Electrical and Electronic Engineering (EEE) — June 2013 – July 2022
Bangladesh University of Engineering and Technology (BUET)

Lecturer, Department of Electrical and Electronic Engineering (EEE) Jan 2010 – June 2013
Bangladesh University of Engineering and Technology (BUET)

Lecturer, Institute of Information and Communication Technology (IICT) Nov 2011 – Jan 2010
Bangladesh University of Engineering and Technology (BUET)

Publications

Journal Articles

[J24] M. M. Haque, M. R. Islam, and S. M. Choudhury. "Investigation of the physical properties through strain effect of monolayer silicon carbide material: DFT analysis". In: *Physica B: Condensed Matter* 697 (2025), p. 416670. DOI: 10.1016/j.physb.2024.416670. URL: https://www.sciencedirect.com/science/article/pii/S0921452624010111.

[J23] M. E. Karim, M. R. Karim, and S. M. Choudhury. "Synergizing deep learning and phase change materials for four-state broadband multifunctional metasurfaces in the visible range". In: *Optics & Laser Technology* 181 (2025), p. 111730. DOI: 10.1016/j.optlastec.2024.111730. URL: https://www.sciencedirect.com/science/article/pii/S0030399224011885.

[J22] M. A. H. Bhuiyan, P. Das, and S. M. Choudhury. "Polarization insensitive electrically reconfigurable metalens for the 2 $\mu mwavelength$". In: *Opt. Mater. Express* 14.12 (Dec. 2024), pp. 2830–2843. DOI: 10.1364/OME.540435. URL: https://opg.optica.org/ome/abstract.cfm?URI=ome-14-12-2830.

[J21] M. E. Karim and S. M. Choudhury. "Sb2S3/AlGaAs based Reconfigurable Metasurface for Dynamic Polarization and Directionality Control of Quantum Emitter Emission". In: *RSC Advances* 40 (2024). DOI: 10.1039/D4RA03726J. URL: https://doi.org/10.1039/D4RA03726J.

[J20] P. Mahmud, K. F. Supti, and S. M. Choudhury. "Lithium niobate photonic topological insulator-based multi-wavelength optical demultiplexer with piezoelectric switch-off". In: *Opt. Express* 32.26 (Dec. 2024), pp. 45786–45800. DOI: 10.1364/OE.541271. URL: https://opg.optica.org/oe/abstract.cfm?URI=oe-32-26-45786.

[J19] M. H. Himel, B. Sikder, T. Ahmed, and S. M. Choudhury. "Biomimicry in Nanotechnology: A Comprehensive Review". In: *NanoScale Advances* 5 (2023), pp. 595–614. DOI: 10.1039/D2NA00571A. URL: https://doi.org/10.1039/D2NA00571A.

[J18] M. E. Karim and S. M. Choudhury. "Reconfigurable Broadband Metasurface with Switchable Functionalities in the Visible Range". In: *Optical Materials Express* 13.5 (2023), pp. 1409–1423. URL: 10.1364/OME.489981.

[J17] M. A. H. Bhuiyan, S. A. Mitu, and S. M. Choudhury. "TiN-GST-TiN all-optical reflection modulator for the $2\mu mwavebandreaching85\%efficiency$". In: *Applied Optics* 61 (2022), pp. 9262–9270. DOI: 10.1364/AO.470247.

[J16] H. Roy, E. Karim, S. Mondal, and S. M. Choudhury. "Custom Gold-Patterned Rewritable Optical Disc based Plasmonic Sensor for Blood Hemoglobin Detection". In: *Optics Continuum* 1.10 (2022). DOI: 10.1364/OPTCON.473106.

[J15] Y. F. Abed, M. A. H. Bhuiyan, and S. M. Choudhury. "T Grating on Nano-Cavity Array based Refractive Index Sensor". In: *J. Opt. Soc. Am. B* 39.9 (2021). DOI: 10.1364/JOSAB.426526.

[J14] M. M. Hassan, F. S. Sium, F. Islam, and S. M. Choudhury. "A Review on Plasmonic Nano-biosensors for Virus Detection with a Focus on Coronavirus". In: *Sensing and Biosensing Research* 33 (2021), p. 100429. DOI: 10.1016/j.sbsr.2021.100429.

[J13] A. Sarker, S. A. Mitu, P. Das, and S. M. Choudhury. "Structurally Tunable Gear-Shaped Plasmonic Sensor". In: *Optics Express* 28.24 (2020), pp. 36070–36083. DOI: 10.1364/OE.410123.

[J12] H. Jiang, S. Choudhury, Z. A. Kudyshev, D. Wang, P. Xiao, Y. Jiang, and A. V. Kildishev. "Enhancing sensitivity to ambient refractive index with tunable few-layer graphene/hBN nanoribbons". In: *Photonics Research* 7.7 (2019), pp. 815–822. URL: 10.1364/PRJ.7.000815.

[J11] H. Jiang, H. Reddy, D. Shah, Z. A. Kudyshev, S. Choudhury, D. Wang, Y. Jiang, and A. V. Kildishev. "Modulating Phase by Metasurfaces with Gated Ultra-thin TiN Films". In: *Nanoscale* 11 (2019), pp. 11167–11172. DOI: 10.1039/C9NR00205G. URL: https://pubs.rsc.org/en/content/articlehtml/2019/nr/c9nr00205g.

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[J7] S. Choudhury, U. Guler, A. Shaltout, V. M. Shalaev, A. V. Kildishev, and A. Boltasseva. "Pancharatnam–Berry Phase Manipulating Metasurface for Visible Color Hologram Based on Low Loss Silver Thin Film". In: *Advanced Optical Materials* 5 (2017), p. 1700196. URL: 10.1002/adom.201700196.

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[J5] J. Kim, S. Choudhury, C. DeVault, Y. Zhao, A. V. Kildishev, V. M. Shalaev, A. Alù, and A. Boltasseva. "Controlling the Polarization State of Light with Plasmonic Metal Oxide Metasurface". In: *ACS Nano* 10.10 (2016), pp. 9326–9333. URL: http://pubs.acs.org/doi/full/10.1021/acsnano.6b03937.

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Conference Proceedings

[C23] M. T. Alam, Y. Mahmud, Z. J. Nikita, and S. M. Choudhury. "Gesture Controlled Bot with Temperature & Humidity (TH) Sensing Features". In: *2024 2nd International Conference on Information and Communication Technology (ICICT)*. 2024, pp. 36–40. DOI: 10.1109/ICICT64387.2024.10839649.

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[C21] S. A. Khan, S. T. Azad, T. Mondal, A. J. Bin Iqbal, and S. M. Choudhury. "Development of an Internet of Things based Bangla Calendar Clock". In: *2023 26th International Conference on Computer and Information Technology (ICCIT)*. 2023, pp. 1–6. DOI: 10.1109/ICCIT60459.2023.10441436.

[C20] A. Mukit, M. S. H. Bijoy, S. M. Choudhury, and M. T. Mahmud. "Discrete Modulated Continuous-Variable Quantum Key Distribution: Security and Noise Tolerance Enhanced by Decoy States and Effective Error Correction Protocol Integration". In: *2023 IEEE International Conference on Telecommunications and Photonics (ICTP)*. 2023, pp. 1–5. DOI: 10.1109/ICTP60248.2023.10490525.

[C19] K. R. Pritom, M. E. Karim, and S. M. Choudhury. "A Polarization Insensitive Achromatic Metalens Operating at Two Wavelengths in Visible Regime". In: *2023 IEEE International Conference on Telecommunications and Photonics (ICTP)*. 2023, pp. 01–05. DOI: 10.1109/ICTP60248.2023.10491019.

[C18] S. Sarkar and S. M. Choudhury. "Design and Performance Analysis of a c-Si Thin-Film Solar Cell Using Plasmonic Ag Nanostructures". In: *2023 IEEE International Conference on Telecommunications and Photonics (ICTP)*. 2023, pp. 01–05. DOI: 10.1109/ICTP60248.2023.10490886.

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[C16] Z. A. Kudyshev, L. J. Prokopeva, M. Song, S. Choudhury, and A. V. Kildishev. "Bi-anisotropic homogenization for efficient metasurface design (invited)". In: *2018 International Applied Computational Electromagnetics Society Symposium (ACES)*. 2018, pp. 1–2. DOI: 10.23919/ROPACES.2018.8364134.

[C15] S. Choudhury, V. A. Zenin, S. Saha, V. M. Shalaev, S. Bozhevolnyi, and A. Boltasseva. "Novel Hard Mask Fabrication Method for Hybrid Plasmonic Waveguide and Metasurfaces". In: *Frontiers in Optics 2017*. Optica Publishing Group, 2017, JTu2A.12. DOI: 10.1364/FIO.2017.JTu2A.12. URL: https://opg.optica.org/abstract.cfm?URI=FiO-2017-JTu2A.12.

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[C12] P. Ahmmed, Z. Ahmed, M. I. J. Rafee, M. A. Awal, and S. M. Choudhury. "Self-localization of a mobile robot using monocular vision of a chessboard pattern". In: *8th International Conference on Electrical and Computer Engineering*. 2014, pp. 753–756. DOI: 10.1109/ICECE.2014.7026828.

[C11] J. Kim, B. Memarzadeh, A. Dutta, S. M. Choudhury, A. V. Kildishev, H. Mosallaei, and A. Boltasseva. "GZO/ZnO Multilayered nanodisk metasurface to engineer the plasma frequency". In: *CLEO: 2014*. Optica Publishing Group, 2014, FW1K.4. DOI: 10.1364/CLEO_QELS.2014.FW1K.4. URL: https://opg.optica.org/abstract.cfm?URI=CLEO_QELS-2014-FW1K.4.

[C10] J. Kim, Y. Zhao, A. Dutta, S. M. Choudhury, A. V. Kildishev, A. Alu, and A. Boltasseva. "Nanostructured Transparent Conducting Oxide Films for Polarization Control with Plasmonic Metasurfaces". In: *CLEO: 2014*. Optica Publishing Group, 2014, FF2C.2. DOI: 10.1364/CLEO_QELS.2014.FF2C.2. URL: https://opg.optica.org/abstract.cfm?URI=CLEO_QELS-2014-FF2C.2.

[C9] S. M. Choudhury and M. A. Matin. "Effect of FSS ground plane on second iteration of hexaflake fractal patch antenna". In: *2012 7th International Conference on Electrical and Computer Engineering*. 2012, pp. 694–697. DOI: 10.1109/ICECE.2012.6471645.

[C8] S. M. L. Kabir, M. S. Hussain, S. M. Choudhury, and A. H. Chowdhury. "Developing A Low-Cost Multiple Motor Switched Photovoltaic Powered Irrigation System". In: *Proceedings of the 3rd International Conference on Water and Flood Management (ICWFM-2011)*. Vol. 2. 2011, pp. 577–581.

[C7] S. M. Choudhury, M. A. Zaman, M. Gaffar, and M. A. Matin. "A Novel Approach for Changing Bandwidth of FSS Filter Using Gradual Circumferential Variation of Loaded Elements". In: *Proceedings of Progress in Electromagnetic Research Symposium PIERS, Cambridge, USA*. 2010.

[C6] S. M. Choudhury, M. Gaffar, M. A. Zaman, and M. A. Matin. "Design of an X band aperture matched horn antenna by optimization of back-lobe and cross-polarization level". In: *International Conference on Electrical & Computer Engineering (ICECE 2010)*. 2010, pp. 550–553. DOI: 10.1109/ICELCE.2010.5700751.

[C5] M. Gaffar, S. M. Choudhury, M. A. Zaman, M. I. Momtaz, M. S. Alam, and M. A. Matin. "Sensitivity analysis of a circularly polarized U-slot microstrip antenna". In: *International Conference on Electrical & Computer Engineering (ICECE 2010)*. 2010, pp. 546–549. DOI: 10.1109/ICELCE.2010.5700750.

[C4] M. A. Zaman, M. Gaffar, S. M. Choudhury, and M. A. Matin. "Optimization and analysis of a Ka band Pickett Potter horn antenna with low cross polarization". In: *International Conference on Electrical & Computer Engineering (ICECE 2010)*. 2010, pp. 542–545. DOI: 10.1109/ICELCE.2010.5700749.

[C3] M. Matin, M. A. Zaman, S. M. Choudhury, and M. Gaffar. "Analysis of a conical corrugated horn operating in the K-band with low cross-polarization and high aperture efficiency, and observing its radiation patterns". In: *2009 IEEE Antennas and Propagation Society International Symposium*. 2009, pp. 1–4. DOI: 10.1109/APS.2009.5171493.

[C2] M. A. Zaman, S. M. Choudhury, M. Gaffar, and M. A. Matin. "Modeling the illumination function of a cassegrain reflector for a corrugated horn feed and calculation of the far field pattern". In: *2009 Loughborough Antennas & Propagation Conference*. 2009, pp. 101–104. DOI: 10.1109/LAPC.2009.5352533.

[C1] S. M. Choudhury. "Design and implementation of a low cost Power Factor Improvement device". In: *TENCON 2008 - 2008 IEEE Region 10 Conference*. 2008, pp. 1–4. DOI: 10.1109/TENCON.2008.4766529.

Patents

[P2] E. Marinero-Caceres, A. Toppo, S. Choudhury, U. Guler, Z. Kudyshev, J. Pekny, S. Pol, H. Reddy, and V. Shalaev. "Thermophotovoltaic system and method of making the same". US20210234498A1. July 29, 2021. URL: https://patents.google.com/patent/US20210234498A1/en.

[P1] A. Shaltout, S. Choudhury, A. V. Kildishev, A. Boltasseva, and V. M. Shalaev. "System for producing ultra-thin color phase hologram with metasurfaces". US9952557B2. Apr. 24, 2018. URL: https://patents.google.com/patent/US9952557B2/en.

Preprint / Manuscript Under Preparation

[X3] M. M. Haque and S. M. Choudhury. "Design of Silicon-Carbide Based Single-Quantum-Well White LED". Under review in *Heliyon*. 2024.

[X2] A. Sarker and S. M. Choudhury. "Design of Dual-Band Plasmonic Absorber for Biomedical Sensing and Environmental Monitoring". Submitted to Optics Continuum. 2024. arXiv: 2411.12356 [physics.optics]. URL: https://arxiv.org/abs/2411.12356.

[X1] S. Sarker and S. M. Choudhury. "Efficiency Enhancement of c-Si/TiO2 Heterojunction Thin Film Solar Cell Using Hybrid Metal-Dielectric Nanostructures". Under review in *Solar Energy*. 2024. URL: https://arxiv.org/abs/2411.19925.

Membership / Fellowship of Learned Societies, Professional Institutions and Other Noteworthy Affiliations

Senior Member, Institute of Electrical and Electronic Engineers (IEEE)

- Secretary, IEEE Bangladesh Section (July 2021 - May 2022)
- Chair, IEEE Young Professionals Bangladesh (Mar 2020 - Apr 2022)
- Chair, IEEE Graduates of the Last Decade (Jan 2013 - Dec 2013)
- Vice -Chair, IEEE Graduates of the Last Decade (Jan 2011 - Dec 2012)
- Student Activities Coordinator, IEEE Bangladesh Section (Jan 2011 - Dec 2012)
- Chair, IEEE BUET Student Branch (Jan 2008 - Aug 2009)
- Treasurer, IEEE BUET Student Branch (Jan 2007 - Dec 2008)

Member, IEEE Photonics Society

- Vice Chair, IEEE Photonics Society Bangladesh (April 2022 – to date)
- Founding Chair, IEEE Photonics Society Bangladesh (Mar 2021 – Apr 2022)

Member, The Optica

- Founding President, Optica Bangladesh Section May 2022 – to date
- Founding Moderator, BUET Optical and Photonics Society July 2022 – to date
- Treasurer, OSA Purdue Chapter, USA Jun 2016 – May 2017

Member, National Young Academy of Bangladesh (NYAB), April 2021 – to date
Life Member, American Alumni Association of Bangladesh (AAAB) , April 2024 – to date
Life Member, Association of BUET Alumni, April 2021 – to date

Student Activities at Purdue University, West Lafayette, IN, USA

- President, **Nanotechnology Student Advisory Council (NSAC)** (Jun 2017 – May 2018)
- Vice-President, **Nanotechnology Student Advisory Council (NSAC)** (Jun 2016 – May 2017)
- Treasurer, SPIE Purdue Chapter, USA (Jun 2015 – May 2016)
- President, Bangladesh Students Association (**Purdue BDSA**), USA (Jul 2017 – Jun 2018)
- Treasurer, Bangladesh Students Association (**Purdue BDSA**), USA (Jul 2015 – Jun 2017)

References

Available upon request