

Aakash Bansal (Doctoral Researcher)

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EXECUTIVE SUMMARY

I am a doctoral researcher at Loughborough University (LU) and submitted my thesis in April 2022. My research is focused on active mmWave beam-steering antenna, dielectric lens and metamaterial systems for applications in 5G. I have extensive experience in RF design, reconfigurable antenna arrays, metamaterials, lenses, microcontrollers, fabrication, and measurement. I have collaborated on consultancy projects for industries and Government of India. I have published 9 journal papers (+ 2 submitted) and presented 3 conference papers. I have won multiple research & outreach awards.

SKILLS

- **Electromagnetic Simulation and Antenna** Designing with EM modelling tools such as CST Microwave Studio, Ansys HFSS, Empire XPU and Keysight Advanced Design Suite (ADS).
- **Programming and Scripting** in C/C++, MATLAB, Python and MS Excel/Google Sheets for automation and data analysis; and building embedded systems and automation units using microcontroller/microprocessor boards including Arduino, AVR MCU, Raspberry Pi and NodeMCU.
- **Operating Lab Equipment** including network analysers, anechoic chamber, 3D-printers, etc; and manufacturing PCB based antenna designs.
- **Research Interests:** Antenna Arrays, Millimeter Wave Communication, 5G Communication, Reconfigurable Antennas, Beamforming/Beam Steering Antennas, Dielectric Lenses, Metamaterial and Metasurfaces.

AWARDS AND ACHIEVEMENTS

- Recipient of [Sir Robert Martin University Prize 2020](#) (LU most prestigious award)
- Runner-up for [Loughborough University's PhD Award for Overall Impact 2020](#).
- Recipient of *Action Volunteer Bronze Award 2020* by LU Students' Union for STEM Promotion Activities.
- Recipient of [Electronics Weekly BrightSparks 2020 Award for research and STEM Promotion in the UK](#).
- Recipient of *Young Engineer Award 2019* by CSIR-CEERI, Pilani.
- *Exemplary Performance Award for Student Training and Research 2017* by MSIT, India.
- Recipient of [IEEE Computer Society Richard E. Merwin Student Scholarship 2016](#).
- Recipient of *MIT GSW Fellowship 2016* for the proposed idea of self-sustained LED Bulbs.
- Received Project Funding for Design of Self Sustained LED Bulbs from NGO: Sristi.
- Won *IEEE MTT-S YouTube/Youku Video Contest* for Offline GPS.
- Recipient of the *IEEE Delhi SAC Outstanding Student Volunteer Award 2016*.
- Winner of multiple Hardware Hackathons organized by TATA Power, DTU 2015, IIIT 2016, etc.
- Winner of various Paper Presentation Competitions organized by MSIT 2016, JMI 2016, etc.

PUBLICATIONS

- 1) (Under Review) A. Bansal, C. J. Panagamuwa, W. G. Whittow, "Millimeter-Wave Wideband SIW Bow-Tie Slot Arrays Antenna with Frequency-Controlled Beam-Steering Operation for 5G Base Stations," Submitted to IEEE Open Journal of Antenna and Propagation, 2022.
- 2) (Under Review) A. Bansal, C. J. Panagamuwa, W. G. Whittow, "Novel Design Methodology of 3D-Printed Lenses for Travelling Wave Antennas," Submitted to IEEE Transactions on Antenna & Propagation, 2022.
- 3) A. Bansal, C. J. Panagamuwa, W. G. Whittow, "Millimeter-Wave Beam Steerable Slot Array Antenna Using an Inter-Digitated Capacitor Based Corrugated SIW", Submitted to IEEE Transactions on Antenna & Propagation, 2022 (Accepted, subjected to corrections).
- 4) A. Bansal, V. Srivastava, R. Gupta, R. K. Sharma, "Novel Microfabricated Slow Wave Structure for a 0.22-THz Sheet Beam Travelling Wave Tube," IEEE Transactions on Electron Devices (Accepted and in Press).
- 5) R. Gupta, G. Bakshi, and Aakash Bansal, "Dual-Band Circularly Polarized Stacked Sapphire and TMM13i Rectangular DRA," Progression in Electromagnetics Research, Vol. 91, pp. 143-153, 2019. [DOI](#).

- 6) A. Bansal, et. al. "Integrated Model for Design of SWS and Beam-Wave Interaction Analysis of a Planar THz Sheet-Beam TWT," Progress in Electromagnetics Research, vol. 87, pp. 179-187, 2019. [DOI](#).
- 7) A. Bansal, "Design and Implementation of a Long-Range Decentralized Vehicular Network," Journal of Mechatronics and Automation, vol. 5, pp. 24-30, 2018. [DOI](#).
- 8) A. Bansal, et. al. "Any Touch: Design and Implementation of a Touch Interface for Bluetooth Enabled Personal Devices," Intl. Journal of Engineering and Manufacturing, vol. 8, no. 2, pp. 1-11, 2018. [DOI](#).
- 9) A. Bansal, R. Gupta, "A review on microstrip patch antenna and feeding techniques." International Journal of Information Technology, vol. 12, no. 1, pp. 1-6, 2018. [DOI](#).
- 10) A. Bansal, et. al. "Analysis and Design of Coaxial Fed Microstrip Antenna on Multilayer substrate at Terahertz Frequency," Journal of Microwave Engineering and Tech., vol. 4, no. 3, pp. 11-14, 2018. [DOI](#).
- 11) A. Bansal, V. Goyal, "Real-Time Electricity Monitoring using Smart Energy Meter in a Smart LAN based Network," Intl. J. of Electronics, Electrical and Comp. System, vol. 6, no. 5, pp. 2348-3117, 2017. [DOI](#).

----- EDUCATION -----

Research Associate, Loughborough University 2019 - 2022

- Dissertation Title: Active Beam-Steering mmWave Antenna System for 5G and Beyond
- Thesis submitted in April 2022

Bachelor of Technology (B.Tech.), Guru Gobind Singh Indraprastha University 2013 - 2017

- 78.3%, Ranked in top 15 out of 200
- Major: Electronics and Communication Engineering

----- WORK EXPERIENCE -----

Engineering Research Associate (Part-Time), Wolfson School, Loughborough University, UK 2019 – Present

- Supervisors: Prof. Will Whittow, Dr. Sheryl Williams
- Collaborating on several projects focused on antenna design and measurement; Building open-source kits to promote engineering to schools.

Academic Support Mentor (Part-Time), Loughborough University, UK 2021 – Present

- Supporting LU's School and Liaison Team's outreach initiatives with curating content and delivery of academic projects to school students of age 14-18. Curating a short course on Introduction to Wireless Communication.

Voluntary Sub-Warden, Telford Hall, Loughborough University, UK 2020 – Present

- Supporting a team of four sub-wardens to create a supporting, enjoyable, stimulating, and safe environment for the 500 student residents of Telford Hall.

Head of Innovation (Voluntary Position), National Indian Students & Alumni Union UK 2019 – 2021

- Leading a team of 12 volunteers providing end-to-end query and grievance redressal for students, and volunteer recruitment. Promoted to Head of Innovation within a year of being at the organization, having led several projects to enable the organization to leverage technology.

Innovation Coach and Consultant, Connecting Dreams Foundation 2018 – 2019

- Responsible for consulting and training of students and faculty under Atal Tinkering Labs on design innovation, introduction to electronics and programming established among 2400 schools throughout India.

Research Associate, CSIR – Central Electronics Engineering Research Institute, Pilani (India) 2017 – 2019

- Developed a computationally efficient, integrated, and dynamic model for the design of Staggered Double Vane Slow Wave Structure (SDVSWS) and beam-wave interaction analysis of a planar Traveling Wave Tubes (TWT) with a sheet electron beam to determine its RF performance.

Intern, Ministry of Electronics and IT, Govt. of India, and Bharti Airtel NEC 2015 – 2017

- Worked on 3G/4G network architecture and mobile location tracking.