Aakash Bansal (PhD Researcher)

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1 SUMMARY

A doctoral researcher at Loughborough University, 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 and presented 3 conference papers till date. I am an award-winning STEM promoter and an active volunteer for various organisations.

2 EDUCATION

- **Doctor of Philosophy (Ph.D.)** (2019 – 2022)
  Wolfson School of Mechanical, Electrical and Manufacturing Engineering
  Loughborough University, UK
  Supervisors: Dr. Chinthana Panagamuwa, Prof. Will Whittow
  Dissertation Title: Design and Development of Active Beamforming mmWave Antenna System for 5G Base Stations and Future IoT Devices
- **Bachelor of Technology (B.Tech.)** (2013 – 2017)
  Guru Gobind Singh Indraprastha University, New Delhi (India)
  Major: Electronics and Communication Engineering
  Percentage Obtained: 78.27%, Ranked in top 15 out of 200 students in the batch

3 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, Metamaterials.

4 AWARDS AND ACHIEVEMENTS

- Recipient of *Sir Robert Martin University Prize 2020* (Loughborough University's most prestigious award)
- One of the three finalists for *Loughborough University's PhD Award for Overall Impact 2020*.
- Recipient of *Action Volunteer Bronze Award 2020* by Loughborough 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 for contributions to the institution.
- Recipient of *IEEE Computer Society Richard E. Merwin Student Scholarship 2016* for academic performance.
- 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 Sristi – An IIM-A based NGO.
- Won *IEEE MTT-S YouTube/Youku Video Contest* for Offline GPS.
- Recipient of the *IEEE Delhi SAC Outstanding Student Volunteer Award 2016* for volunteering with IEEE.
- Winner of multiple Hardware Hackathons organized by TATA Power, DTU 2015, NSIT 2016, IIIT 2016, etc.
- Winner of various Paper Presentation Competitions organized by MSIT 2016, JMI 2016, etc.

5 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 designing, measurement, testing and data analysis. Built open-source kits with the aim to promote engineering to school students.

- **Academic Support Mentor (Part-Time), Loughborough University, UK** (2021 – Present)
  Supporting Loughborough University'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.
- **Head of Innovation (Voluntary Position), National Indian Students & Alumni Union UK** (2019 – Present)

Leading a team of 12 volunteers spread all over the UK, 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, becoming more agile and efficient in the way it delivers outcomes.

- **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. The model was further used to design and simulate a 0.22THz Sheet Beam TWT of 100W output power.
- **Student Intern, Ministry of Electronics and IT, Govt. of India and Bharti Airtel Network Experience Centre** (Short Periods between 2015 and 2017)
  Worked on 3G/4G network architecture and location tracking using mobile signal density.

6 PUBLICATIONS (2 JOURNAL PAPER SUBMITTED, 9 JOURNAL PAPERS PUBLISHED, 3 CONFERENCE PRESENTATIONS)

- (Under Review) A. Bansal, C. J. Panagamuwa, W. G. Whittow, "Electronically Steerable Slot Array Antenna on a Modified Corrugated SIW for 5G Base Stations", Submitted to IEEE Transactions on Antenna & Propagation.
- (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 IET Microwaves, Antenna & Propagation.
- (Under Review) A. Bansal, C. J. Panagamuwa, W. G. Whittow, "Modified Dielectric Lenses for Travelling Wave Antenna Array," Submitted to IEEE Transactions on Antenna & Propagation.

- 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 for Publication).
- A. Bansal, C. J. Panagamuwa, W. G. Whittow "Active mmWave Beam-Steering Antenna for 5G and Future IoT Applications," 32nd Simulia EuroNorth Regional User Meeting, October 2019.
- R. Gupta, G. Bakshi, and Aakash Bansal, "Dual-Band Circularly Polarized Stacked Sapphire and TMM13i Rectangular DRA," Progression in Electromagnetics Research, Vol. 91, 143-153, 2019.
- A. Bansal, V. Srivastava, and R. Gupta, "Integrated Model for Design of SWS and Beam-Wave Interaction Analysis of a Planar THz Sheet-Beam TWT," Progress in Electromagnetics Research, Vol. 87, 179-187, 2019.
- A. Bansal, "Design and Implementation of a Long-Range Decentralized Vehicular Network." Journal of Mechatronics and Automation 5.1 (2018): 24-30, 2018.
- A. Bansal, et al. "Any Touch: Design and Implementation of a Touch Interface for Bluetooth Enabled Personal Devices." International Journal of Engineering and Manufacturing 8.2, 2018.
- A. Bansal, R. Gupta, "A review on microstrip patch antenna and feeding techniques." International Journal of Information Technology, 1-6, 2018.
- A. Bansal, et al. "Analysis and Design of Coaxial Fed Microstrip Antenna on Multilayer substrate at Terahertz Frequency," Journal of Microwave Engineering and Technologies 4.3, 11-14, 2018.
- A. Bansal, V. Goyal, "Real-Time Electricity Monitoring using Smart Energy Meter in a Smart LAN based Network." International Journal of Electronics, Electrical and Computational System, 2017.

- N. Rathee, A. Bansal, A. Gupta, S. Singh, R. Devasia, "Digital resistance box: An approach to generate the desired value of resistance by automatically varying the potentiometer." IEEE International Conference on Power Electronics, Intelligent Control and Energy Systems (ICPEICES) 2016, New Delhi.
- (Poster) A. Bansal, S. Jain, "Offline GPS: Location Tracking with Mobile Signal Density", International Conference on Intelligent Communication, Control and Devices 2016, Dehradun.
- (Poster) A. Bansal, S. Jain, "Centralized Traffic Monitoring using Mobile Signal Density", International Symposium on Fusion of Science and Technology 2016, New Delhi.