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Research Interests	<ul style="list-style-type: none"> • Full-stack distributed ledger technology system research, with specialization in blockchain. • Mathematical modeling and simulation of semiconductor quantum nanostructures. 	
Work Experience	<p>Nanyang Technological University, Singapore Nov 2017 – Ongoing</p> <p>Senior Research Engineer <i>Advisor:</i> Prof. K. Y. Lam, Asst. Prof. A. Chattopadhyay</p> <p>‘Cybersecurity Protocol and Mechanism for e-Logistics of Dangerous Goods Tracking Using Blockchain’ funded by a ~\$1 million National Research Foundation (NRF) Singapore grant.</p> <p>I work on full-stack distributed ledger technology systems, with specialization in blockchain.</p>	
Research Experience	<p>KdotP Soft., (NTU) Singapore Aug 2016 – Jan 2017</p> <p>Software Engineering Intern <i>Advisor:</i> Assoc. Prof. Weijun Fan</p> <p>Worked on the simulation engine, database creation and development of a GUI for KdotP Soft, a scientific software for semiconductor physics and device physics simulation.</p>	
	<p>Indian Institute of Science (IISc) Bangalore, India May 2012 – Oct 2012</p> <p>Research Intern, Microwave R&D Lab <i>Advisor:</i> Prof. K. J. Vinoy</p> <p>Worked on delay engineering using cascaded microwave all-pass filters for acoustic imaging by chirp waveforms for application in transmission lines acting as dispersive structures.</p>	
	<p>Qualcomm Inc., Bangalore, India (Offer Declined) Summer 2012</p> <p>Interim Engineering Intern, Corporate R&D Lab</p> <p>Selected among top 6 students from NIT Trichy. Not pursued due to personal reasons.</p>	
	<p>National Institute of Technology (NIT) Trichy, India Dec 2011 – Feb 2012</p> <p>Research Intern, Antennas Lab <i>Advisor:</i> Assoc. Prof. D. S. Kumar</p> <p>Worked on smart-fractals employing algorithms for rapid beam-forming in smart antennas.</p>	
	<p>Intl. Institute of Information Technology (IIIT) Hyderabad May 2011 – June 2011</p> <p>Research Intern, VLSI and Embedded Systems Lab <i>Advisor:</i> Asst. Prof. S. R. Chowdhury</p> <p>Built an intelligent health security system for automated real-time breath rate tracking.</p>	
	<p>Oil India Limited (OIL), Duliajan, India Dec 2010</p> <p>Industry Trainee <i>Advisor:</i> Mr. T. N. Madhavan</p> <p>Worked on various electronic/pneumatic instruments and developed a control system model.</p>	
Education	<p>Doctor of Philosophy (Ph.D.), Electrical & Electronic Engineering CGPA: 4.63/5.00</p> <p>Nanyang Technological University (NTU) Singapore 2013 – 2017</p> <p><i>Thesis:</i> Semiconductor Quantum Nanostructures for Optoelectronic Applications</p> <p><i>Advisor:</i> Assoc. Prof. Weijun FAN and Prof. Dao Hua ZHANG</p>	
	<p>Bachelor of Technology, Electronics & Communication Engineering CGPA: 8.36/10.0</p> <p>National Institute of Technology (NIT) Trichy, India 2009 – 2013</p> <p><i>FYP:</i> Mathematical Modeling of a Metamaterial Regular Polygon Split Ring Resonator</p> <p><i>Advisor:</i> Prof. S. Raghavan</p>	

Skillset	Programming: Golang, C++, C/Embedded C, Python, Fortran, Perl, Verilog HDL. Engineering tools/libraries: MATLAB, Origin, COMSOL, OpenCV, NumPy, SciPy. Blockchain Platforms: Hyperledger Fabric, Ethereum (Solidity), Corda. Web technologies: NodeJS, HTML, PHP, CSS, JavaScript. Operating systems: Linux, Unix, RTOS, ROS, Windows, DOS. Firmware development: BLE, NFC, RFID Zigbee, I2C, SPI and UART. Development platforms: Arduino, Raspberry Pi, Beagleboard, TI Launchpad, FPGAs.	
Mentoring	Nanyang Technological University (NTU) Singapore Mentor Aug 2015 – Aug 2017 Mentored 2 students in their Final Year Projects (FYPs) on semiconductor simulation.	
Teaching	Nanyang Technological University (NTU) Singapore Language consultant, HG4045 Structure of a Language Spring 2016 – 2017 Recording, transcription, phonemic analysis and documentation of Assamese as a language. Laboratory assistant, E2004L Digital Electronics Fall 2016 – 2017 Combinational logic circuits, counter and shift registers, logic circuit simulation. Teaching assistant, EE1003 Introduction to Materials for Electronics Spring 2015 – 2016 Characteristics of semiconductors, biomaterials, smart materials and nanomaterials. Laboratory assistant, EE1071 Introduction to EEE laboratories Fall 2015 – 2016 Electronic components, working with AC waveforms, soldering and circuit-building. National Institute of Technology (NIT) Trichy, India Teaching assistant, EC204 Transmission Lines and Waveguides Spring 2012 – 2013 Planar transmission lines, composite substrates and electromagnetic CAD tools. Teaching assistant, EC307 Antennas and Propagation Spring 2012 – 2013 Microstrip antennas, CNT antennas, metamaterial loaded antennas and wearable antennas. Non-affiliated teaching Maker Faire, Singapore 2015 – 2016 Introduction to Robotics, Arduino, Raspberry Pi, PCB CAD design and 3D printing.	
Organization	TheBlockchainSPIRIT Hackathon Lead Organizer Jun 2018 Organized a Singapore wide 2-day blockchain hackathon on leading blockchain platforms – Hyperledger, Ethereum and NEM with 100+ participants and international representation. TEDxNTU Lead Curator Apr 2016 – Mar 2017 Co-Curator Apr 2015 – Mar 2016 Involved in the planning and organization of TEDx (Technology, Entertainment, Design) chapter of NTU Singapore. Served as the lead organizer of the TEDxNTU 2016 edition. NTU – World of Wisdom (WOW) Co-Founder and Vice-Chairman Apr 2015 – Mar 2017 Involved in the development of a think tank bringing together students and providing them with opportunities to mould their skills in diverse areas of science, economics, arts, etc.	

NTU – Graduate Student Council (GSC)

Committee Director

Apr 2015 – Mar 2016

Involved in the planning and organization of academic workshops and talks. The flagship event is the 3-minute-thesis (3MT) in collaboration with NTU library, Student Life Office.

IEEE Young Professionals, Singapore Chapter

Executive Committee Member

Nov 2015 – Nov 2016

Involved in facilitating young graduates to become world class professionals, enhancing their skills and establishing a diverse professional network, through workshops and networking.

Robotics and Machine Intelligence (RMI), NIT Trichy

Head, Electronics division

July 2011 – June 2013

Involved in robotics project including micromouse, line-follower, PIR motion sensor, accelerometer controller. Other projects involved image processing and PID control systems.

Honors and Awards

- IEEE Region-10 Young Professionals Affinity Group Award in recognition and appreciation of valued services and contributions; Aug 2016.
- NTU Research Scholarship, for the duration of Aug 2013 – July 2017
- University Graduate Scholarship, University of Glasgow, *offered* 2013
- *Grant for Student* of EUR 750 to present a paper at the 6th Intl. Congress on Adv. Electromagnetic Materials in Microwaves & Optics, St. Petersburg,; Sept 2012.
- Govt. of India's University Grant Commission (UGC) Sponsored Fellowship for Summer Research Internship at Indian Institute of Science (IISc), Bangalore; May – July 2012.

Academic Services**Talks (*Invited*)**

- 7th Annual World Congress of Advanced Materials 2018 in Xiamen, China; Sep 2018.
- 4th Annual World Congress of Smart Materials 2018 in Osaka, Japan; Mar 2018.
- 3rd Annual World Congress of Smart Materials 2017 in Bangkok, Thailand; Mar 2017.
- EMN Meeting on Optical Communications 2016 in Dubai; Nov 2016.

Journal Reviewer

- Institute of Electrical and Electronics Engineers (IEEE): *Journal of Lightwave Technology*.
- Institute of Physics (IOP): *Materials Research Express*; *Nanotechnology*; *2D Materials*.
- Springer Open: *Nanoscale Research Letters*.
- Multidisciplinary Digital Publishing Institute (MDPI): *Computation*; *Applied Sciences*.

Conference Reviewer

- IEEE TENCON 2016 – IEEE Region 10 Conference
- IEEE CRALT 2016 – Conference on Recent Advances in Lightwave Technology

Professional Memberships

- *Member*, Institute for Electrical and Electronics Engineers (IEEE)
- *Member*, IEEE Photonics Society
- *Life Member*, Society of Electromagnetic Compatibility (EMC) Engineers India, SEMCE(I)

Media Coverage

- 'NIT-T student gets grant to attend conference on metamaterials', The Hindu, Aug 2012
- 'Young India', a mass broadcast radio program by All India Radio (AIR), Oct 2012

Citation Indices

- Citations: 158
- h-index: 7
- i10-index: 5

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| Thesis Publication | <ul style="list-style-type: none"> • S. Bose, “Semiconductor Quantum Nanostructures for Optoelectronic Applications”, <i>Doctoral Dissertation</i>, Nanyang Technological University Singapore, 2018. |
| Journal Publications | <ul style="list-style-type: none"> • Y. Liu, S. Bose, W. J. Fan, “Effect of size and shape on electronic and optical properties of CdSe quantum dots”, <i>Optik – International Journal for Light and Electron Optics</i>, 155, 242-250, 2018. • S. Bose, S. Shendre, Z. Song, V. K. Sharma, D. H. Zhang, C. Dang, W. J. Fan, H. V. Demir, “Temperature-dependent Optoelectronic Properties of Quasi-2D Colloidal Cadmium Selenide Nanoplatelets”, <i>Nanoscale</i>, 9, 6595-6605, 2017. • S. Bose, W. J. Fan, D. H. Zhang, “Optoelectronics of Inverted Type-I CdS/CdSe Core/Crown Quantum Ring”, <i>Journal of Applied Physics</i>, 122 (16), 163102, 2017. • Z. Song, S. Bose, W. J. Fan, D. H. Zhang, Y. Y. Zhang, S. S. Li, “Quantum Spin Hall Effect and Topological Phase Transition in $\text{InN}_x\text{Bi}_y\text{Sb}_{1-x-y}/\text{InSb}$ Quantum Wells”, <i>New Journal of Physics</i>, 19 (7), 073031, 2017. • S. Bose, Z. Song, W. J. Fan, D. H. Zhang, “Effect of lateral size and thickness on the electronic structure and optical properties of quasi two-dimensional CdSe and CdS nanoplatelets”, <i>Journal of Applied Physics</i>, 119 (14), 143107, 2016. • Z. G. Song, S. Bose, W. J. Fan, S. S. Li, “Electronic band structure and optical gain of $\text{GaN}_x\text{Bi}_y\text{As}_{1-x-y}/\text{GaAs}$ pyramidal quantum dots”, <i>Journal of Applied Physics</i>, 119 (14), 143103, 2016. • W. J. Fan, S. Bose, D. H. Zhang, “Electronic bandstructure and optical gain of lattice matched III-V dilute nitride bismide quantum wells for $1.55\mu\text{m}$ optical communication systems”, <i>Journal of Applied Physics</i>, 120 (9), 093111, 2016. • K. Prabu, S. Bose, D. S. Kumar, “BPSK based subcarrier intensity modulated free space optical system in combined strong atmospheric turbulence”, <i>Optics Communications</i>, 305, 185-189, 2013. • M. Levy, S. Bose, D. S. Kumar, A. V. Dinh, “Rapid beam forming in smart antennas using smart-fractal concepts employing combinational approach algorithms”, <i>International Journal of Antennas and Propagation</i>, vol. 2012, ID 467492, 2012. • M. Levy, S. Bose, A. V. Dinh, D. S. Kumar, “A novelistic fractal antenna for ultra wideband (UWB) applications”, <i>Progress In Electromagnetics Research B</i>, 45, 369, 2012. • S. Bose, M. Ramaraj, S. Raghavan, S. Kumar, “Mathematical modeling, equivalent circuit analysis and genetic algorithm optimization of an N-sided regular polygon split ring resonator (NRPSRR)”, <i>Elsevier Procedia Technology</i> 6, 763-770, 2012. • S. Bose, S. Delikanli, V. K. Sharma, C. Dang, W. J. Fan, D. H. Zhang, H. V. Demir, “Electronic Bandstructure and Excitonic Absorption in CdSe Nanoplatelets”, <i>Nanoscale</i>. [under review] • S. Bose, W. J. Fan, D. H. Zhang, “Optoelectronics of Quasi Two-dimensional $\text{CdS}_x\text{Se}_{1-x}$ Nanoplatelets”, <i>Journal of Physics D: Applied Physics</i>. [under review] |
| Conference Publications | <ul style="list-style-type: none"> • S. Bose, M. Raikwar, A. Chattopadhyay, D. Mukhopadhyay, K. Y. Lam, “BLIC: A Blockchain Protocol for IC Manufacturing and Supply Chain Management”, <i>IEEE International Conference on Blockchain (Blockchain)</i>, 2018. • S. Mitra, S. Bose, S. Sen Gupta, A. Chattopadhyay, “BLAV: Blockchain Protocol for Tamper-resilient and Secure Data Aggregation in Autonomous Vehicles”, <i>14th IEEE Asia Pacific Conference on Circuits and Systems (APCCAS)</i>, 2018. • M. Raikwar, S. Ruj, S. Bose, S. Sen Gupta, A. Chattopadhyay, K. Y. Lam, “Security and Privacy of Permissioned Blockchains”, <i>1st Workshop on Blockchain and Sharing Economy Applications (BlockSEA)</i>, 2018. [progress] |

- S. Bose, S. Delikanli, A. Yeltik, M. Sharma, O. Erdem, C. Dang, W. J. Fan, D. H. Zhang, H. V. Demir, "Anomalous Spectral Characteristics of Ultrathin sub-nm Colloidal CdSe Nanoplatelets", *Conference on Lasers and Electro-Optics (CLEO)*, 2017.
- S. Bose, S. Delikanli, M. Z. Akgul, Y. Gao, W. J. Fan, D. H. Zhang, H. V. Demir, "Inverted Type-I CdS/CdSe Core/Crown Colloidal Quantum Ring", *Conference on Lasers and Electro-Optics (CLEO)/Europe and the European Quantum Electronics Conference (EQEC)*, 2017.
- S. Bose, W. J. Fan, D. H. Zhang, "Theoretical Investigations of Excitonic Absorption in Quasi Two-dimensional CdSe Nanoplatelets", *12th Conference on Lasers and Electro-Optics Pacific Rim (CLEO-PR)*, 2017.
- S. Bose, W. J. Fan, D. H. Zhang, "Strain Profile and Size Dependent Electronic Bandstructure of Type-I CdS/CdSe Quantum Ring", *12th Conference on Lasers and Electro-Optics Pacific Rim (CLEO-PR)*, 2017.
- S. Bose, Z. Song, W. J. Fan, D. H. Zhang, "KdotPsoft: Modelling and Simulation of Semiconductors and Device Physics", *9th International Conference on Materials for Advanced Technologies*, 2017.
- Z. Song, S. Bose, W. J. Fan, X. H. Tang, D. H. Zhang, S. S. Li, "Electronic structure and optical gain of $\text{InAs}_{1-x-y}\text{N}_x\text{B}_y/\text{InP}$ pyramidal quantum dots", *9th International Conference on Materials for Advanced Technologies*, 2017.
- T. Chaudhuri, Y. C. Soh, S. Bose, L. Xie, H. Li, "On assuming Mean Radiant Temperature equal to air temperature during PMV-based thermal comfort study in air-conditioned buildings", *42nd Annual Conf. of the IEEE Industrial Electronics Society, (IECON)*, 2016.
- S. Bose, W. J. Fan, J. Chen, D. H. Zhang, C. S. Tan, "Strain Profile and Size Dependent Electronic Band Structure of GeSn/SiSn Quantum Dots for Optoelectronic Application", *International Conference on Fibre Optics and Photonics*, 2014.
- S. Bose, W. J. Fan, C. Jian, D. H. Zhang, C. S. Tan, "Strain profile, electronic band structure and optical gain of self-assembled Ge quantum dots on SiGe virtual substrate", *7th International Silicon-Germanium Technology and Device Meeting (ISTDM)*, 2014.
- S. Bose, K. J. Vinoy, "Group delay engineering using cascaded all pass filters for wideband chirp waveform generation", *IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT)*, 2013.
- K. Prabu, S. Bose, D. S. Kumar, "Analysis of optical modulators for Radio over Free Space Optical Communication systems and Radio over Fiber systems", *Annual IEEE India Conference (INDICON)*, 2012.
- S. Bose, M. Ramraj, S. Raghavan, "Design, analysis and verification of Hexagon Split Ring Resonator based Negative Index Metamaterial", *Annual IEEE India Conference (INDICON)*, 2012.
- S. Bose, S. Raghavan, "Theoretical Investigations of a N-sided Regular Polygon Split Ring Resonator with Skew Rotation", *The 6th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics*, 2012 [accepted, but not presented] – Awarded 'Grant for Students' - registration fee waiver and travel allowance (EUR 750)
- M. Ramraj, S. Raghavan, S. Bose, S. Kumar, "Elliptical Split Ring Resonator: Mathematical Analysis, HFSS Modeling and Genetic Algorithm Optimization", *Progress In Electromagnetics Research Symposium (PIERS)*, 2012.
- M. Levy, D. S. Kumar, A. Dinh, S. Bose, "A novelistic approach for rapid beam forming in smart antennas for wireless applications using smart-fractal concepts and new algorithm", *International Conference on Advances in Mobile Network, Communication and its Applications (MNCAPPS)*, 2012.
- S. Bose, K. Prabu, D. S. Kumar, "Real-time breath rate monitor based health security system using non-invasive biosensor", *3rd International Conference on Computing Communication & Networking Technologies (ICCCNT)*, 2012.

- S. Bose, K. Prabu, D. S. Kumar, “Array Signal Processing & Optimization using Algorithms in Nature”, *International Proceedings of Computer Science & Information Technology*, 2012.

References

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