

ABHILASH SINGH

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Junior Research Fellow, Indian Institute of Science Education and Research Bhopal, India
Personal Website: <https://www.abhilashsingh.net>

EDUCATION

Integrated M.Tech. [5 Year Dual Degree] (CGPA: 9.41/10 or 3.76/4) **Aug 2012 - July 2017**
School of Information and Communication Technology,
Department of Electronics and Communication Engineering,
Gautam Buddha University (State Govt. University),
Greater Noida, India

M.Tech in Wireless Communication and Networks.

Thesis: "Intelligent algorithm approach towards optimal coverage in wireless sensor networks."

Advisor: Dr. Sandeep Sharma

B.Tech. in Electronic and Communication Engineering.

Project 1 title: "Modelling and analysis of polarization noise in vertical cavity surface emitting LASERs."

Project 2 title: "Development of a digital marma therapy gloves."

Project 3 title: "Development of online examination portal for the university."

Advisor: Dr. Sandeep Sharma

Higher Secondary Examination (10+2) in Science (Percentage: 81%) **May 2012**

Kendriya Vidyalaya No. 2, Ichapur, West Bengal, India

Central Board of Secondary Education

Secondary Examination (10th) (CGPA: 9.0/10) **May 2010**

Kendriya Vidyalaya No. 2, Ichapur, West Bengal, India

Central Board of Secondary Education

EXPERIENCE

Indian Institute of Science Education and Research Bhopal August 2019 - Present
Teaching Assistant *Bhopal, India*

- Subject: Data Analysis and Statistics (using MATLAB™ /Python/R)
- Subject: Remote Sensing & GIS and Remote Sensing & GIS Laboratory

Indian Institute of Science Education and Research Bhopal March 2018 - Present
Junior Research Fellow *Bhopal, India*

- Working on NISAR (NASA-ISRO Synthetic Aperture Radar) project in collaboration of ISRO and NASA.
- Objective:
SAR (Synthetic Aperture Radar) image processing to estimate soil moisture and its application to predict flood using machine learning and artificial intelligence.
- Progress:
Developed a MATLAB™ based Graphical User Interface for estimation of soil moisture using SAR images.
Designed and in house construction of pin meter for measuring surface roughness of the ground.

Defence Research and Development Organisation (DRDO) June 2015 - July 2015
Summer Research Intern *Dehradun, India*

- Worked on "Design and simulation of elementary SRAM and its controller using Verilog on Model Sim"
- Advisor: Mr. Asheesh Thapliyal, Scientist D.

PUBLICATIONS

Journal Articles

- J10. Kumar, A., Beg, Z., **Singh, A.** and Gaurav, K. (2020). “Estimating discharge of the Ganga River from satellite altimeter data,” *Journal of Hydrology, Elsevier*. (Submitted)
- J9. **Singh, A.**, Nagar, J., Sharma, S. and Kotiyal, V. (2020). “A Gaussian Process Regression Approach to Predict the k -barrier Coverage Probability for Intrusion Detection in Wireless Sensor Networks,” *Expert Systems with Applications, Elsevier*. (Under review)
- J8. Kotiyal, V., **Singh, A.**, Sharma, S. and Singh, J. (2020). “An Enhanced Cuckoo Search Algorithm for Node Localisation in Wireless Sensor Networks,” *Applied Soft Computing, Elsevier*. (Under Review)
- J7. Singh, J., Chaturvedi, A., Sharma, S. and **Singh, A.** (2020). “A Novel Model to Eliminate the Doubly Near-Far Problem in Wireless Powered Communication Network,” *IET Communication, IEEE*. (Under Review)
- J6. **Singh, A.**, Sharma, S. and Singh, J. (2020). “Nature-Inspired Algorithms for Wireless Sensor Networks: A Comprehensive Survey,” *Computer Science Review, Elsevier*. (Under Review)
- J5. **Singh, A.**, Kotiyal, V., Sharma, S. and Nagar, J. (2020). “A Machine Learning Approach to Predict the Average Localisation Error with Applications to Wireless Sensor Networks,” *IEEE Access, IEEE*. DOI: 10.1109/ACCESS.2020.3038645
- J4. **Singh, A.**, Gaurav, K, Meena, G. K. and Kumar, S. (2020). “Estimation of soil moisture applying modified Dubois model to Sentinel-1; A regional study from Central India,” *Remote Sensing, Vol. 12, issue 14, pp. 2266, MDPI*. DOI: 10.3390/rs12142266 [[PDF](#)] [[MATLAB CODE](#)]
- J3. Sharma, S., Kumar R., **Singh, A.** and Singh, J. (2020). “Wireless information and power transfer using single and multiple path relays,” *International Journal of Communication Systems, Vol. 33, issue 14, pp. e4464, Wiley*. DOI: 10.1002/dac.4464 [[PDF](#)]
- J2. **Singh, A.**, Sharma, S., Singh, J. and Kumar, R. (2019). “Mathematical modelling for reducing the sensing of redundant information in WSNs based on biological inspired techniques,” *Journal of Intelligent and Fuzzy Systems, Vol. 37, issue 5, pp. 6829–6839, IOS press*. DOI: 10.3233/JIFS-190605 [[PDF](#)]
- J1. **Singh, A.**, Sharma, M., Kumar, R., Singh, S. P. and Madhesiya, J. R. (2018). “Modelling and analysis of polarization noise in vertical cavity surface emitting lasers,” *Multiscale and Multidisciplinary Modeling, Experiments and Design, Vol. 2, issue 3, pp. 151-157, Springer Nature*. DOI: 10.1007/s41939-018-0033-9 [[PDF](#)] [[MATLAB CODE](#)]

Conference Proceedings

- C5. **Singh, A.**, Meena, G. K., Kumar, S. and Gaurav, K. (2019). “Evaluation of the penetration depth of L-and S-band (NISAR mission) microwave SAR signals into ground,” In *URSI AP-RASC 2019, Radio Science, IEEE*. DOI:10.23919/URSIAP-RASC.2019.8738217 [[PDF](#)] [[PPT](#)] [[MATLAB CODE](#)]
- C4. **Singh, A.**, Meena, G. K., Kumar, S. and Gaurav, K. (2018). “Analysis of the effect of incidence angle and moisture content on the penetration depth of L- and S-band SAR signals into the ground surface,” *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Vol. IV-5, pp. 197-202*. DOI:10.5194/isprs-annals-IV-5-197-2018 [[PDF](#)] [[VIDEO](#)] [[MATLAB CODE](#)]
- C3. Deo, B. K. S., **Singh, A.**, Kumar, R. and Singh, K. K. (2018). “An improved scheme Asymmetrically and Symmetrically clipped DC-biased Optical (ASDCO)-OFDM for wireless im/dd optical system,”

In International conference on computing for sustainable global development (INDIACom), 2018. [\[PDF\]](#)

- C2. Kumar, R. and **Singh, A.** (2018). “Throughput optimization for wireless information and power transfer in communication network,” In Signal Processing and Communication Engineering Systems (SPACES), 2018 conference (pp. 15), IEEE. DOI:10.1109/SPACES.2018.8316303 [\[PDF\]](#)
- C1. Sharma, S., Singh, J., Kumar, R. and **Singh, A.** (2017). “Throughput-save ratio optimization in wireless powered communication systems,” In Information, communication, instrumentation and control international conference (pp. 16), IEEE. DOI:10.1109/ICOMICON.2017.8279031 [\[PDF\]](#)

Abstracts

- A1. **Singh, A.**, Gaurav, K. and Kumar, S. (2020). “Evaluating the potential of Sentinel-1 images for the estimation of soil moisture on an alluvial Fan,” EGU General Assembly 2020, Vienna, Austria. DOI: <https://doi.org/10.5194/egusphere-egu2020-19614> [\[PDF\]](#)

AWARDS, ACHIEVEMENTS, HONORS AND GRANTS

- **DST INSPIRE FELLOWSHIP**

- Selected for the prestigious DST INSPIRE FELLOWSHIP in “Engineering Sciences.” Awarded by Department of Science and Technology (DST), Govt. of India.

- **GOLD MEDALIST**

- Throughout first rank holder in B.Tech. and M.Tech.

- **NATIONAL LEVEL EXAMS QUALIFIED**

- **GATE** 2017
- **UGC NET** 2016, 2017 and 2018.

- **RANK IN MATLAB™ CENTRAL**

- Rank 637 out of 72034 (Top 1 %) in MATLAB™ Cody in MathWorks. (Click)
- Rank 1743 out of 15746 in MATLAB™ File Exchange in MathWorks. (Click)

- **GRANTS**

- Fully funded DAAD fellowship (€ 1325) for attending a summer school on “Geospatial data science using R” at Friedrich Schiller University Jena, Germany.
- Full scholarship to attend the highly competitive “Machine Learning Summer School” at Telkom University, Indonesia.

SKILLS

- Computer Programming: C, MATLAB™, Python, R.
- Analytical: Data Analysis, Machine Learning.
- Web Development: PHP, HTML, CSS.
- Hardware Description Language: VHDL, Verilog.
- Hardware Hands on: Microcontrollers (MSP430), Raspberrypi.
- Miscellaneous: OS: Linux, PPT: \LaTeX beamer, Documentation and Report: \LaTeX MS word & Inkscape.
- Languages: English, Hindi, Bengali.

MISCELLANEOUS EXPERIENCE

- Professional Affiliations
 - ISPRS Individual Membership (Member Id: 61733, Member since 2018).
 - IEEE Membership (student) (Member Id: 95635042, Member since 2019)
 - * IEEE Geoscience and Remote Sensing, IEEE Communications, IEEE Sensors Council, IEEE Signal Processing & IEEE Young Professionals
 - Indian Radio Science Society (Member Id: S2019022, Member since 2019)
- Leadership Roles in IEEE
 - Ambassador for the IEEEExtreme 14.0 (Region-10, IEEE M.P Sub Section)
- Reviewer
 - Journal of Intelligent and Fuzzy Systems, IOS Press
 - Wireless Personal Communications, Springer
 - Journal of The Institution of Engineers (India): Series B, Springer
- Certification
 - Certificate of Achievement in Electronic Material and Devices from edX Verified. Massachusetts Institute of Technology. E-learning. (*Click*)
 - Certificate of Achievement in MATLAB Verified. MathWorks. E-learning. MATLAB Onramp self-paced training course. (*Click*)

TRAININGS/ WORKSHOPS/ CONFERENCES

- Attended “Machine Learning Summer School (MLSS)” August 03rd-09th, 2020. Organized by Telkom University, Indonesia.
- Attended a summer school on “Geospatial data science using R” August 26th-31th, 2019. Organized by Friedrich Schiller University Jena, Germany.
- Attended a Conference on “Unmanned Aerial System in Geomatics” April 06th-07th, 2019. Organized by IIT Roorkee, Greater Noida Extension Center, U.P, India.
- Attended a Conference on “URSI-Asia Pacific Radio Science Conference” March 09th-15th, 2019. Organized by JNU, URSI, InRaSS and INSA at India Habitat Centre, New Delhi. **(Talk)**
- Attended a one day workshop on “Pre-Conference Radar Training Workshop” Organized by URSI Asia Pacific radio science conference, held on 10th March 2019 at IHC, New Delhi.
- Attended a winter school on “Artificial Intelligence” Organized by Infosys Center for Artificial Intelligence at Indraprastha Institute of Information Technology Delhi (IIIT D), held on 18th-21st January 2019.
- Attended a two day workshop on “Training Course on Remote Sensing, GIS and Machine Learning Methods for Environment, Natural Resources and Agriculture” Organized by Indraprastha Institute of Information Technology Delhi (IIIT D) in collaboration with Indian society for ecological economics, held on 4th-5th January 2019.
- 15 day visit as Project JRF on NISAR project at Indian Institute of Remote Sensing, ISRO, Dehradun, India, 16 December - 30 December '18.

- Attended a one day workshop on “Data Science using R” Organized by Center for Computational Biology, Indraprastha Institute of Information Technology Delhi (IIIT D), held on 15th December 2018.
- Attended a Conference on “ISPRS Technical Commission V Education and Outreach: Geo-spatial Technology - Pixel to People” NOVEMBER 20-23, 2018. Organized by Indian Institute of Remote Sensing, ISRO, Dehradun, India. **(Talk)**
- Attended the “NISAR Science Workshop” November 15-17, 2018. Space Applications Centre, ISRO, Ahmedabad, India.
- Attended a short-term training course on “SAR Data Processing and Analysis for Land Applications with Special Emphasis on L & S Bands” Organized by Space Application Centre, ISRO, Ahmedabad, India, 06-10 August '18.
- 15 day visit as Project JRF on NISAR project at Indian Institute of Remote Sensing, ISRO, Dehradun, India, 21 May - 04 June '18.
- Attended a one day workshop on “Application of Satellite Altimetry for inland Waterbodies” Organised by Indian Institute of Remote Sensing, ISRO, Dehradun, India, 30 May '18.
- Attended a National Seminar on “Medical image Analysis & Signal Processing” sponsored by IEEE. 22-23 September 2017, Department of Electronics & Communication Engineering, G L Bajaj institute of Technology and Management (GLBITM), Greater Noida, UP, India.
- Attended a Conference on “Signal Processing and Communication Engineering Systems” in association with IEEE. 4-5 January 2018 , Department of Electronics & Communication Engineering, Koneru Lakshmaiah University (KLU), Vijayawada, Andhra Pradesh.
- Attended a hands-on workshop on “Embedded System Design Using MSP430 Microcontroller” sponsored by Texas Instrument. 4-6 December 2017, in Collaboration with Sapience Consulting under TI University Program at ABESIT, Ghaziabad.
- Attended a Conference on “Information, communication, instrumentation and control” in association with IEEE. 17-19 August 2017, Department of Electronics & Communication Engineering, MEDI-CAPS University, Indore, Madhya Pradesh. **(Talk)**

REFERENCES

Dr. Kumar Gaurav, Assistant Professor
Department of Earth and Environment Sciences,
Indian Institute of Science Education and Research
Bhopal, India.
Email: kgaurav@iiserb.ac.in

Dr. Sandeep Sharma, Faculty and Head,
Department of Electronics and Communication
Engineering,
Gautam Buddha University, Greater Noida.
Email: sandeepsharma@gbu.ac.in

Dr. Shashi Kumar, Scientist/Engineer SE
Department of Photogrametry and Remote Sensing,
Indian Institute of Remote Sensing,
Indian Space Research Organisation (ISRO).
Email: shashi@iirs@gov.in

Dr. Navaid Rizwi, Faculty
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The information stated above are true to the best of my knowledge and abilities.

November 14th, 2020

Abhilash Singh