Dr. Amit Vikram **Singh**

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Personal website https://amitvsingh.netlify.com/

Summary

- A result-oriented professional with 5+ years of experience in Research and Development with a strong background in Optics and Scientific Computing.
- Collect and analyze large-scale data, synthesize information, find the root cause of the problem, and validate solutions.
- Entrepreneurial mindset with excellent interpersonal skills of project management, team building, effective collaboration, and clear communication.

Professional Experience

Scientific Researcher (DAAD Scholarship and Research Assistant) at Friedrich Schiller University Jena, Germany. Degree: Dr. rer. nat. **10/2014 – 01/2022**

- Design, simulation, and analysis of nanoscale plasmonic structures using large-scale Electromagnetic simulations.
- Leader and dedicated team member of multiple interdisciplinary projects.
- Teaching assistantship and making questions for mid-term and final exams of master's students.
- Technical & non-technical writing and publishing in peer-reviewed international journals.

Start-up (SinglePhoton Technologies) **08/2019 – 03/2020**

- We have developed and deployed an AI-based prototype in a team of engineers and scientists.
- Communicated with all stakeholders for the development of a sustainable business model.

Computational Skills

- Computational Photonics: MEEP FDTD solver (using Scheme interface), Lumerical FDTD Solutions, JCMwave (Finite Element Method), Beam Propagation Method.
- Matlab, Python, R, HTML & CSS fundamentals.
- Big Data Essentials: Hadoop, Mapreduce, Apache Spark, Docker, pytest.
- Cloud computing: IBM Watson Studio, AWS SageMaker.
- Ability to work on large-scale data through cluster environment (Tools: HPC, Maui, Ganglia, WinSCP).
- Raytracing Software: Opticstudio (Zemax – First order optics), POVRay (graphics).
- Typesetting Software: Latex, Rmarkdown.
- Operating System: Windows, Macintosh, Linux.
- Web-design: HUGO/Blogdown/Netlify. Build and deployed my website.

Professional Data Science Certificates (300 hrs)

Professional Data Science Certificates in Python from IBM and in R from Harvard University **08/2018 – 08/2019**

- Python: Data Analysis (NumPy, pandas), Data Visualization (matplotlib, folium, seaborn), Machine Learning (scikit-learn, SciPy), Deep Learning (TensorFlow).
- R libraries: Data Analysis (tidyverse), Data Visualization (ggplot2), Data Wrangling (dplyr), Machine Learning (caret).

- Capstone project: NYC housing complaints problem and its business-oriented solution. The project solutions located the problem area and predicated the resources needed in the future.
- Good command of the concept of probability and statistical tools such as inference & modeling.

Languages

- Hindi – Mother tongue
- English – C2 (proficient)
- German – B1 (spoken and written)

Hands-on Lab Experience

- Master thesis Project: Displacement measurement using core structures of phase singularity with sub-pixel accuracy. Skills developed: hands-on experience with optical metrology methods, Labview, Matlab.
- Research project: Developed and implemented a cost-effective in-house source set-up for the spectral characterization of photonic structures with a fiber-based spectroscope.

Education

Ph.D. in Physics/Optics at Friedrich Schiller University Jena, Germany. **10/2014 – 02/2022**

Master of Technology in Applied Optics at Indian Institute of Technology Delhi, India & University of Stuttgart, Germany. (Grade: 9.1/10) **07/2011 – 05/2013**

- Holography, Lasers, Optical instruments and Metrology, Aspheric Optics.
- DAAD exchange student.

Bachelor and Master of Science in Physics (Major) at the University of Allahabad, India. (Grade: 75% passed with honors) **07/2006 – 05/2011**

Projects, Publications and Conferences

- Publications as first author on project 'Spatiotemporal evolution of Airy plasmons and its applications'. First author publications: 1. Published in OSA Continuum (Impact factor 1.86), DOI: https://doi.org/10.1364/OSAC.392840, 2. Published in Optics Express (impact factor 4.86), DOI: https://doi.org/10.1364/OE.439764.
- Completed 500+ hrs of online data science courses. My capstone project 'Business model for NYC Housing complaints has been cited by other learners worldwide.
- Applied my skills in a team of a tech start-up. We have built prototypes, developed a sustainable business model, and pitched our product to public and private investors.
- Written Blogs on artificial intelligence, tutorial on creating websites.
- Talk in International Conference DoKDoK 2018 on contemporary topics in science.
- Actively participated in ASML PhD Master class 2020 event. Worked in a team on a challenging case being faced at ASML and proposed solutions to tackle the problems.

Honours, awards and Memberships

- GitHub Arctic Code Vault contributor badge (2019).
- Deutscher Akademischer Austauschdienst (DAAD) scholarship to pursue research in Germany (awarded in 2014).
- Deutscher Akademischer Austauschdienst (DAAD) scholarship under IIT sandwich model to carry out master thesis at the University of Stuttgart, Germany (awarded in 2012).
- CSIR-NET, National eligibility for a lectureship at Indian Universities, approved by Council of Scientific and Industrial Research India (awarded in 2011).

Place: Jena, Germany **Amit Vikram Singh**
Date: 14/01/2022