

Dr. Manish Modani

Principal Solution Architect, India-South Asia, NVIDIA Graphics Pvt Ltd

Certified Level 3 Thought Leader

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<https://www.linkedin.com/in/drmanishmodani/>

Professional Summary:

A seasoned technocrat with a unique blend of technical expertise and business acumen, bringing end-to-end experience across the product lifecycle — from discovery to delivery. He has successfully addressed numerous complex and business-critical technical challenges with measurable impact on organizational outcomes. Manish has contributed significantly to national skill development initiatives, training researchers to become proficient in Accelerated Computing, HPC+AI, HPC, and Quantum Computing. Currently, he serves as the NVIDIA technical lead for key national initiatives, including the National Supercomputing Mission, National Quantum Mission, National Monsoon Mission, and India AI Mission.

**Technical Leadership, *Research & Development, *HPC, *AI, *Accelerated Computing, *Data Analytics, *Applied Mathematics, *Business Development, *Quantum Computing, *HPC-QC, *Gen-AI*

Professional Experience (18+ years industry experience):

- Year 2020 to till date NVIDIA Graphics Pvt Ltd
- Year 2018 to 2020 IBM Sales & Development, India
- Year 2015 to 2018 IBM Systems & Development Lab India
- Year 2012 to 2015 IBM Research, UK (Onsite)
- Year 2010 to 2012 IBM Systems & Development Lab, India
- Year 2008 to 2010 Flagstone Re, India
- Year 2006 to 2008 Cray Supercomputers, India
- Year 2001 to 2007 IIT Delhi India (Research)

Professionals Skills:**1. Communication (Written & Oral):**

- Track record of ~50 publications in peer reviewed international Journals and Patents.
- Interaction with Researchers, Developers, Offering Managers, Business Developers & users' community.
- Publication on social media: WhatsApp, LinkedIn.
- Invited Speakers at various Panel discussions/Conferences/Workshops/Summit

2. Skill Development:

- Organized Train The Trainer Program to train 40+ faculties (<https://shorturl.at/adlY5>) on Quantum Computing.
- Participated in various faculty development program (eg NIT Rourkela, Calcutta University, to train them on Accelerated Quantum Computing
- Delivered Sessions in Quantum, HPC, HPC+AI Workshops (C-DAC, Ministry of Earth Science, IITs, IISER, IISc etc)
- Organized BootCamp/Hakathon/Workshops.

3. Volunteering Activity:

- Teaching Mentally Disabled students since last five years at SSK (www.spasticssocietyofkarnataka.org)
- Curriculum Influence for Thakur College, Vellore Institute of Technology, IIIT Bangalore, CIT Coimbatore

Education:

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- Ph.D: 2007, Indian Institute of Technology (IIT) Delhi, India.
- CSIR-NET: June 1999, Mathematics.
- Certifications: Level 3 Thought Leader, R Python, Data Science, Scientist @ Ministry of Earth Science, India

Disclosures/Patents:

1. Manish Modani & Giri Prabhakar (2012) A cloud-based expert-sourcing system for advanced computational applications, Prior Art Database IPCOM000222342D /2012 (2)
2. Manish Modani, Giri Prabhakar and Ravindra Sure (2013), Backfill Scheduling Method for Embarrassingly Parallel Jobs to improve Higher Performance System Throughput. 14/138,239.
3. Jitendra Singh, Manish Modani & Others (2019) PLOT EVALUATION FOR FARM PERFORMANCE. P201810345US01

Publications:

4. M. Sharan, A. K. Yadav and Manish Modani (2002), "Simulation of short- range diffusion experiment in low wind convective conditions", Atmospheric Environment, 36, 1901-06.
5. M. Sharan, Manish Modani, A. K. Yadav, (2003), "Atmospheric Dispersion: An overview of mathematical modeling framework", Proc. Indian Natn. Sci Acad, 69, 725-744.
6. M. Sharan and Manish Modani, (2005) "An analytical model for the dispersion of pollutants in low wind conditions", Pure and Applied Geophysics. 162,1861-1892.
7. M. Sharan and Manish Modani (2006), "A two-dimensional analytical model for the dispersion air pollutants in the atmosphere with a capping inversion", Atmospheric Environment, 40, 3479-3489.
8. M. Sharan and Manish Modani (2007), "Variable K-theory model for the dispersion of air pollutants in low-wind conditions in the surface-based inversion", Atmospheric Environment, 41, 6951-6963.
9. Jean Pierre Issartel, M. Sharan and Manish Modani (2007), "An Inversion technique to retrieve the source of a tracer with an application to synthetic satellite measurements", Proceedings of Royal Society A, 463, 2863-2886.
10. Manish Modani (2007), "Mathematical Models for Dispersion of Atmospheric Pollutants in the surface based Inversion", PhD thesis, IIT Delhi. New Delhi.
11. Manish Modani, M. Sharan, and S. C. Rao (2008), "Numerical solution of elliptic partial differential equations on parallel systems," Applied Mathematics and Computations 195, 162-182.
12. Manish Modani and M. Sharan (2012), "A Model for the Simulation of Crosswind Integrated Concentrations in the Surface-Based Inversion Layer", Int. J. Model. Simul. Sci. Comput. 03, 1250017.
13. Manish Modani and Andrew Porter (2012), I/O at Scale in the Weather Research Forecast (WRF) Model. Advances in Engineering Software. In Press.
14. A.P. Jones, J. Crain, F.S. Cipcigan, V.P. Sokhan, M. Modani, G.J. Martyna (2013), "Electronically coarse-grained molecular dynamics using quantum Drude oscillators, Molecular Physic", An International Journal at the Interface Between Chemistry and Physics, 3465-3477.
15. Manish Modani, Rupert Ford, Constantinos Evangelinos and Michael Johson (2015), "Evaluating the Scalability of Stencil Codes at Scale", Submitted to EASC conference proceedings hosted by the ACM Digital Library.
16. Michael Johnston, Manish Modani, David Moss & Kirk E Jordan (2015) "Enabling High-Performance Database Applications on Supercomputing Architectures: Accelerating the Oasis Loss Modelling Framework", Emerging Technology Conference (EMiT) Proceedings, UK.
17. Nisha Agrawal, Abhishek Das, Rishi Pathak, Pankaj Dorlikar and Manish Modani (2021) "Molecular Dynamics Simulations Accelerate on Elastic Multi GPU Architecture Build with FP64/ TF32 Latest Streaming

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Multiprocessor Ampere Architecture”, ICTS, Springer

18. Nisha Agrawal, Abhishek Das, Rishi Pathak and Manish Modani (2022) Highly Portable C++ Based Simulator with Dual Parallelism and Spatial Decomposition of Simulation Domain using Floating Point Operations and More Flops Per Watt for Better Time-To-Solution on Particle Simulation. <https://ieeepdf-express.org/>
19. Nisha Agrawal, Abhishek Das, Rishi Pathak and Manish Modani (2022), Running a Single Instruction Execution Stream to a Massively Parallelized Computational Operations. <https://ieeepdf-express.org/>
20. Nisha Agrawal, Abhishek Das and Manish Modani (2022), Massive Parallelism Enables Mathematical Equations Factoring Physics for Data Assimilation and Accelerates Dynamic Solver Computation for Accurate Predictability. (Submitted).
21. Adrian Issai Arasu, Manish Modani and Nagabhushana Rao Vadlamani (2022), Application of Machine Learning Techniques in Temperature Forecast”, Submitted to Atmospheric Environment Journals Elsevier.

Project Reports:

22. M. Jhonston, M. Modani, C. Evangelions, K. Jordan, & D. Moss (2014) Evaluation of the Oasis Loss Modeling Framework on HPC Systems, Submitted to Lloyds Bank, UK.
23. M. Modani, Paul Sherwood & Keith Refson (2014) Porting CASTEP to Intel Phi, Submitted to Intel Parallel Computing Center, Intel Inc.
24. Michael Seaton, M. Modani & Paul Sherwood (2014), DL_MESO (DPD) on Intel Phi, Submitted to Intel Parallel Computing Center, Intel Inc.
25. Thomas Ankers, M. Modani & Astroid Cook (2014), Patient Cost Benchmarking-Predictive Analytics. Submitted to Albatross Financial Services, UK.

Conference-Presentations:

26. In association with M. Sharan (2006), “Variable K-theory model for the dispersion of air pollutants in low-wind conditions in the surface-based inversion”, International Conference on Mesoscale Processes in Atmosphere, Ocean and Environmental Systems held at Indian Institute of Technology, Delhi, India, February 14-17, 2006. Abstract volume.
27. In association with Andrew Proter, (2013), “I/O at Scale in the Weather Research Forecast (WRF) Model”, Solving Software Challenges for Exascale (EASC) Edinburgh, Scotland.
28. In association with Stephen Pickles (2013), Performance of Tri-diagonal Solver, Gungho (UK next generation weather model) developer’s group meeting.
29. In association with Mike Ashworth, Andrew Porter (2014), “The IBM Blue Gene/Q : Application Performance, Scalability and Optimization”, Workshop on Scalability at European Centre for Medium-Range Weather Forecasts (ECMWF), 14-15 April.
30. In association with Neil Morgan, Phil Ridley, Terry Hewitt & Vadim Elishev (2014), “Energy Aware Scheduling and Power Measurement: An Initial Investigation” International conference on Super Computing (SC) Nov 16-17.
31. In association with Luigi Brochard, Neil Morgan, Vadim Elishev, Francois Thomas, Terry Hewitt (2015), “Energy Aware Scheduling on Blue Wonder”, Super-Computing Frontiers 2015, Singapore.
32. In association with Rupert Ford & Constantinos Evangelinos (2015) “Evaluating the Scalability of Stencil Codes at Scale”, Solving Software Challenges for Exascale (EASC) Edinburgh, Scotland. April, 21-23.
33. In association with Michael Johnston, David Moss & Kirk E Jordan (2015) “Enabling High-Performance Database Applications on Supercomputing Architectures: Accelerating the Oasis Loss Modelling Framework”, Emerging Technology Conference (EMiT), Manchester, UK.
34. In association with, Valéry Weber, A. Cristiano I. Malossi, Ivano Tavernelli, Teodoro Laino, Costas Bekas, Nina Wilner, Tom Heller and Alessandro Curioni (2016), “First Experiences with ab initio Molecular Dynamics on OpenPOWER: the case of CPMD”, International Super Computing (ISC) High Performance

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Workshops 2016. LNCS 9945, pp 228-234, 2016

35. In association with, Valéry Weber, A. Cristiano I. Malossi, Ivano Tavernelli, Teodoro Laino, Costas Bekas, Nina Wilner, Tom Heller and Alessandro Curioni (2016), "CPMD experiences OpenPOWER", Poster#98, Super Computing (SC).
36. In association with Banerjee, A., Das, A. (2023). Multi-GPU-Enabled Quantum Circuit Simulations on HPC-AI System. In: Sharma, N., Goje, A., Chakrabarti, A., Bruckstein, A.M. (eds) Data Management, Analytics and Innovation. ICDMAI. Lecture Notes in Networks and Systems, vol 662. Springer, Singapore. https://doi.org/10.1007/978-981-99-1414-2_58
37. In association with A. Banerjee and A. Das, "Performance analysis of quantum algorithms on Param Siddhi-AI system," *2022 International Conference on Trends in Quantum Computing and Emerging Business Technologies (TQCEBT)*, Pune, India, 2022, pp. 1-5, doi: [10.1109/TQCEBT54229.2022.10041499](https://doi.org/10.1109/TQCEBT54229.2022.10041499)

Workshop Conducted:

38. IBM-NVIDIA workshop on Application Performance Analysis on Accelerators, Feb 17-19, 2016, EGL, Bangalore, India.
39. Blue Gene/Q Advanced Training and Optimisation Course, at Science and Technical Facilities Council, Daresbury, UK. 22-23 Oct, 2013.
40. High Performance Computing, IBM day at Indian Institute of Technology Delhi, New Delhi, India, Sept 25, 2012
41. High Performance Computing: MPI, OPENMP, OPTIMIZATION, DEBUGGING & PROFILING at Vellore Institute of Technology, VELLORE, India. Sept 19-20, 2011
42. High Performance Computing & Partial Differential Equations, Central University of Rajasthan, Kishangarh, Rajasthan, India. 5th Oct. 2011.
43. High Performance Computing: Emerging Field, Pre-placement talk at Indian Institute of Technology Delhi, New Delhi India. Nov 12, 2011.
44. Application of Artificial Intelligence, Cloud and High-Performance Computing in Weather Forecast, organized by Open Power Foundation, June 5, 2020.
45. Advancement in Weather Forecast using Cognitive Computing & Data Science Approaches, W3APACM 2020, Organized by India Metrological Society and Gautam Buddha University, June 20, 2020.
46. Real Time Weather and Covid Data Analysis, organized by Thakur College of Science and Commerce, Mumbai. June 27, 2020.
47. IISER-Trivandrum, International Workshop and Hands on session by HPE & NVIDIA, Aug 17, 2021.
48. Introduction to Accelerated Computing, VIT AP. Aug 25, 2021.
49. Organized 3 days HiPC workshop for GPU Track (<https://hipc.org/hipc-training/#gpu-training>) (Sept 13-15, 2021).
50. GROMACS acceleration demonstration at IIT Delhi, Oct 19, 2021.
51. Fundamentals of Accelerated Computing with CUDA C/C, Oct 29, 2021.
52. N-ways of GPU Bootcamp, IPR & NARL, Oct 20-21, 2021.
53. Conducted Session and Lab to demonstrate the Weather Forecast using AI in the workshop on "AI/ML techniques for the Weather and Climate applications", IIT Kanpur, March, 12-14th 2022 (<https://www.iitk.ac.in/clmw/>).
54. Bootcamp/workshop at IISER Pune on N-ways of GPU computing, April 28, 2022.
55. MD Application (LAMMPS and NAMD) acceleration demonstration at IIT Delhi. Feb 25, 2022.
56. Accelerated Computing with CUDA, January to March 2022 (<http://hpcshiksha.cdac.in/schedule>).
56. An Introduction to Accelerated Computing, IIT Kanpur, May 26, 2022.
57. Quantum Computing at NVIDIA : cuQuantum and QODA, Q-Symp, C-DAC Pune, Jan 31, 2023

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58. Quantum Computing Simulation Acceleration with cuQuantum and CUDA Quantum, IISER Calcutta, June 9, 2023
59. Accelerated Computing in Weather Forecast, FourPI, Bangalore, July 13, 2023
60. HPCQC || cuQuantum and CUDA Quantum, IIT Banaras, C-DAC Patna & C-DAC Calcutta, July 15, 2023.
61. Data Driven Accelerated Weather Forecast using Deep Learning and Quantum Computing, Ministry of Earth Sciences. Sept 27, 2023
62. Train The Train program on Quantum Computing, April 12-13, 2024. (<https://shorturl.at/adlY5>)