Bhanu Teja

✉ bhanutej@gmail.com 🐦 @Btez in Bhanu Teja 🌐 bhanuteja-cds.github.io/i/

Work experience

Jan-2022 – present	**Project scientist,** National Supercomputing Mission(NSM). *Parallel implementation of numerical solution of volume integral equation arising in Electromagnetic scattering of chiral bodies using method of moments. (Used C++, MPI and PETSc).*
Aug-2019 – Dec-2021	**Research Associate,** Department of computational and data sciences, Indian Institute of Science. *Variational multiscale methods(VMS) for turbulent flows.*
Aug-2018 – Jul-2019	**Senior software engineer,** Mathworks. *Refactored and optimized the Code generation and deployment stage of Simulink®.*
Aug-2012 – Jul-2018	**Graduate student,** Department of computational and data sciences, Indian Institute of Science. *An Arbitrary Lagrangian Eulerian Volume of fluid method for free surface and floating body dynamics simulation.*
Oct-2011 – Jul-2012	**Faculty,** Underwriters Laboratories - Jain fire labs, Jain University, Bangalore.
Jan-2011 – Sep-2011	**Senior engineer,** Risk and Insurance, Risk Management Services India(RMSI) pvt ltd, Noida.
Aug-2009 – Dec-2010	**Project officer,** National Disaster Management Authority(NDMA), Government of India. *Development of probabilistic seismic hazard map of India.*
Teaching	**Teaching assistant,** *Multigrid methods(2015), Numerical methods(2020) and Introduction to computing for artificial intelligence and machine learning(ICAIML, 2022)*

Education

2012 – 2018	**Ph.D., Indian Institute of Science** Computational and data sciences. Thesis title: *An Arbitrary Lagrangian Eulerian Volume of fluid method for free surface and floating body dynamics simulation.*
2005 – 2008	**M.tech. Civil engineering, Indian Institute of Technology, Madras.** Thesis title: *Seismic performance evaluation of RC building connected with and without X-Braced friction Dampers.*
2001 – 2005	**B.tech. Civil engineering, Indian Institute of Technology, Madras.** Thesis title: *Non-linear time history analysis of tall structure for seismic load using damper.*

Research Publications

Journal Articles

1. S. Joshi, T. Anandh, **B. B. Teja**, and G. Sashikumaar, "On the choice of hyper-parameters of artificial neural networks for stabilized finite element schemes.," *International Journal of Advances in Engineering Sciences and Applied Mathematics*, vol. 13, pp. 278–297, 2021. 🔗 DOI: 10.1007/s12572-021-00306-9.

2. **B. B. Teja** and S. Raghukanth, "Ground motion simulation for january 26, 2001 gujarat earthquake by spectral finite element method," *Journal of Earthquake Engineering*, vol. 16, no. 2, pp. 252–273, 2012. 🔗 DOI: 10.1080/13632469.2011.634493. eprint: https://doi.org/10.1080/13632469.2011.634493.

Conference Proceedings

1 **B. B. Teja**, K. N. Yogendra, and N. Balakrishnan, "Parallel solution for 3d volume integral equation using petsc library," in *Proceedings of the 1st Microwave, Antennas, and Propagation Conference (IEEE MAPCON2022)*, Bangalore, India, 2022, pp. 64–67.

2 **B. B. Teja** and G. Sashikumaar, "On spurious velocities in computations of interface flows using fictitious domain method," in *Proceedings of 12th World Congress on Computational Mechanics, 2016)*, Seoul, South Korea, 2016, pp. 39–47.

Book Chapter

1 G. Sashikumaar and **B. B. Teja**, Eds., *Computational Science and Its Applications, Computational Ship Hydrodynamics: Modeling and Simulation*. 2 Park Square, Milton Park, Abingdon, Oxon, OX144RN: Taylor and Francis group, 2021, ISBN: 978-0-429-28873-9.

Skills

Programming	▉	Fortran, C++, CUDA, Python and parallel programming with MPI.
Dev tools	▉	GDB, valgrind, VScode, git and Intel ONEAPI.
Scripting	▉	MATLAB, Bash and R.
Libraries	▉	deal.ii(Differential Equations Analysis Library), PETSc, LAPACK, Boost, PyTorch, PANDAS and networkX.
Misc.	▉	Totalview debugger, Gmsh, Paraview and LaTeX typesetting and publishing.

Academic and Research Interests

Fundamental	▉	Calculus, Linear algebra, Probability and statistics(The Trinity).
Applied	▉	Numerical methods for differential equations, Computational Fluid Dynamics, High performance computing, Dynamical systems, Stochastic differential equations, Data assimilation, Pattern recognition and neural networks, Deep learning, Linear and nonlinear optimization, operations research etc.

Mini projects

Text classification	▉	Using different Natural Language Processing using BERT, Word2Vec and TF-IDF for text classification. Did feature engineering, model design and testing. Evaluation and comparison among the three models.
Vehicle Detection	▉	Created a filtering mask based on box class scores using threshold and implemented non-max suppression algorithm. Built a car detection system using YOLO algorithm using pre-trained Keras YOLOv2 model and detected objects in the car detection dataset.

References

Dr. Sashikumaar Ganesan, Chair, Computational and data sciences, IISc.

Dr. Atanu Mohanty, Instrumentation and applied physics, IISc.

Dr. S.T.G Raghukanth, Structural engineering division, IIT Madras.

Dr. Yoginder Kumar Negi, Supercomputer education and research center(SERC), IISc.