Mukunda Madhava Nath

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Experience

Samsung R&D Institute Bangalore (SRIB), Bengaluru, IN **Advanced Technology Lab, CTO**
Chief Engineer - Mechanical Simulation *Dec'2017 - Present*

- Published two international conference papers while establishing a new direction in flexible electronics research. Drafted research proposals leading to government funding in collaboration with national and international institutions. Developed standards and guidelines for mechanical simulation of soft materials with hyperelastic and viscoelastic properties.
- Automated mobile drop and bending simulation setup in HyperMesh starting from unorganized CAD data to simulation submission in LS-DYNA and Optistruct. Developed custom scripts for analytical validation to eliminate critical errors.
- Developed simulation methodology guidelines by validating capabilities and limitations of solvers, automating material model parameterizations, and improving modeling practices to reduce computation time. Incorporated best practices to improve the documentation process for the team.
- Currently leading mechanical design, simulation, and structural optimization activities for next generation mobile and communication devices.

General Motors Technical Centre India, Bengaluru, IN **Vehicle Engineering CAE**
Senior Engineer - Safety CAE (Pedestrian Protection) *Oct'2016 - Nov'2017*
Engineer - Safety CAE (Safety Crashworthiness & Pedestrian Protection) *Aug'2013 - Oct'2016*

- Promoted mid-year to Senior Engineer position and awarded by VP for exemplary execution of a project and for improving active hood modeling guideline in the process. The project involving 1000+ simulations was completed before time and improved guideline reduced modeling effort from ∼8 hours to 1 hour.
- Reduced ∼2 weeks worth of effort in projects running for ∼8-10 weeks by automating activities such as job submission, energy balance check, computing test correlation score, active hood modeling, and input file creation for design of experiment studies using best-positioned tools (Bash, Tcl-Tk, Javascript, and Excel VBA).
- Improved safety star ratings of Chevrolet Camaro and Cadillac ATS/CTS by developing counter-measures for ENCAP & USNCAP and correlating pedestrian protection CAE models to test results with 95%+ accuracy
- Responsible for end-to-end evaluation of structural crashworthiness and pedestrian protection ratings for full vehicle models. Experienced in setting up and debugging explicit dynamics simulations, intensive of contact and material nonlinearities, using tools such as HyperMesh, Primer, LS-DYNA, and Animator.

Indian Institute of Science Bangalore, Bengaluru, IN **M2D2 Lab, Dept of Mech Engg**
Project Assistant, under Prof. G. K. Ananthasuresh *Aug'2010 - Jun'2011*

- Benchmarked an FEA package developed in IISc (HyFEM) to commercial packages - Abaqus, Ansys, and Comsol Multiphysics. Developed methodology for simulating micro-compliant mechanisms using multiple packages simultaneously.

Education

Indian Institute of Science Bangalore **Centre for Product Design and Manufacturing**
Master of Design, Product Design and Engineering, GPA: 6.4/8.0 *Jul'2011 - Jul'2013*
Design, Fabrication, and Testing of a Novel and Cost-Effective Soil Moisture Sensor Meter for Farming Applications in India, Guide: Prof. G. K. Ananthasuresh.

National Institute of Technology Silchar **Department of Mechanical Engineering**
Bachelor of Technology, Mechanical Engineering, GPA: 8.29/10.0 *Jul'2006 - Jun'2010*
Design and Analysis of Thermal Actuators for MEMS Applications, Guide: Prof. P. K. Patowari.

Patents

1. Dibakar Sen, Mukunda Madhava Nath, Nitin Gupta. **A Seat Assembly for a Cycle, Granted Patent No. 382332.** Application No. 2105/CHE/2013 filed May 2013, Granted November 2021.

Publications

1. Mukunda Madhava Nath, Gaurav Gupta. **Modeling the Mechanical Performance of Bendable Display Under Cyclic Loading**. In proceedings of *2019 IEEE International Flexible Electronics Technology Conference (IEEE IFETC 2019)*, August 2019, Vancouver, Canada. doi: 10.1109/ifetc46817.2019.9073716
2. Mukunda Madhava Nath, Gaurav Gupta. **Characterization of a Flexible Device Using a 3-Point Rolling Test**. In proceedings of *2018 IEEE International Flexible Electronics Technology Conference (IEEE IFETC 2018)*, August 2018, Ottawa, Canada. doi: 10.1109/ifetc.2018.8583958
3. Mukunda Madhava Nath, Nitin Gupta, Dibakar Sen. **Design of an Ergonomic Bicycle Seat**. In proceedings of *International Ergonomics Conference - Humanizing Work and Work Environment*, December 2014, IIT Guwahati, Assam, India.
4. P. K. Patowari, M. M. Nath, A. S. Bharali, J. Gogoi, C. K. Singh. **Comparative Study of Different Micro-Thermal Actuators for Micro-Electro-Mechanical-System Application**. *Journal of Advanced Manufacturing Systems (JAMS)*, Volume 11, Issue 1(2012) pp. 17-26, January 1, 2012. doi: 10.1142/S0219686712500023
5. P. K. Patowari, M. M. Nath, A. S. Bharali, J. Gogoi, C. K. Singh. **Comparative Study of Different Micro-Thermal Actuators for MEMS Application**. In Proceedings of the *3rd International and 24th All India Manufacturing Technology, Design and Research (AIMTDR) Conference*, December 2010, Visakhapatnam, India.
6. P. K. Patowari, M. M. Nath, A. S. Bharali, J. Gogoi, C. K. Singh. **Analysis of a Monometallic Two Arm Horizontal Thermal Actuator for MEMS**. In Proceedings of the *2nd International Conference on Mechanical and Electronics Engineering (ICMEE)*, August 2010, Japan. doi: 10.1109/icmee.2010.5558570

Skills

Simulation Packages: LS-DYNA, Optistruct(Nastran), Abaqus.
Optimization Tools: LS-OPT, LS-TaSC, HyperStudy, Optistruct.
Pre-Processing & CAD: HyperMesh, Primer, LS-Prepost, NX Unigraphics, Solidworks.
Programming: Python, Bash, Excel VBA, MATLAB.

Others

- Samsung Citizen Award by Managing Director, Samsung R&D Institute Bangalore, May 2019
- Letter of Appreciation by Vice-President, General Motors Technical Centre India, September 2016
- Design for Six Sigma (DFSS) *BlackBelt*, General Motors University, May 2015
- Graduate Scholarship from MHRD, Government of India for pursuing masters' degree, 2011-13
- Certificate of Proficience (along with Cash Scholarship) from the Govt. of Assam for securing state rank of 24 and 32 in X (2004) and XII (2006) standards