

CURRICULUM VITAE

Ashutosh Mishra

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Potential Start Date : Immediately (After serving a month of notice period)

Expertise

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- Battery recycling
 - Battery thermo-mechanical modeling.
 - Battery cooling system design.
 - Nuclear power plant and its components
 - Thermo-mechanical ratcheting/fatigue of scaled down model of main vessel in nuclear power plant.
 - Material modeling of Composites, Biomaterials and 3D Printed parts.
 - Macro mechanical modeling of irradiation embrittlement.
 - Thermal modeling of Lithium-ion battery
 - Computational biomechanics.

Computational Skills

FEA Packages : ABAQUS

3D and Surface Modeling Package : CATIA (certified expert by Dassault Systems France)

Programming : C++ and Fortran (UMAT codes with self developed integration procedure- SSIP), MATLAB

Research Experience

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- Battery thermal modeling using MATLAB, ANSYS.
 - Thermo-mechanical fatigue and ratcheting study of steels.
 - Creep fatigue studies of 3D Printed polymer parts
 - Radiation modeling of materials used in space applications.
 - Hands on research experience on the modeling and simulation of deformation behavior, fatigue and creep analysis of steels in Nuclear power plants.
 - Developed **UMAT code** implementing time independent and dependent constitutive models for ratcheting analysis of thin cylindrical shells.

Work Experience

1. **Assistant Professor** at Applied Mechanics Department, MNNIT, Allahabad (April 2018 onwards).
2. **Assistant Professor** at Amity University, Noida (Feb 2016 –March 2018)
3. **Research Associate** at Indira Gandhi Centre for Atomic Research, Kalpakkam (September 2015-Feb 2016)
4. **Application Engineer** in CLYDE PUMPS INDIA Pvt. Ltd, Noida. (April 2010 to Feb 2011)
5. **Lecturer** in JSS Academy of Technical Education, Noida. Taught strength of materials, manufacturing Technology and CAD/CAM. (July 2009 to Feb 2010)

Subjects Taught

Analysis and design of composite structures, Applied Elasticity, Engineering Mechanics, Material Science, Strength of Materials.

Invited Talk

1. Topic: An insight into the structural integrity assessment considering creep as a governing failure mode.
Short Term Course on “Structural Integrity and Reliability (SIR2020)” from Oct 28 – Nov 01, 2020 in MNNIT Allahabad.
2. Topic: Macro-mechanical modeling of 3D printed Material
Short Term Course on “Advanced Trends in Manufacturing and Material Characterization” - 24-28 Feb 2020 in IET Bundelkhand University.[Sponsored by TEQUIP-3]
3. Topic: Nano fluids: Recent Application and Challenges.
Short-Term Course on Advances and in Applications of Nano Fluids at MNNIT Allahabad, October, 2018.[Sponsored by TEQUIP-3]
4. Topic: Nuclear Safety and Security regimes : understanding security levels
Workshop on "Developing Emerging Nuclear Security Practitioners" at Pandit Deendayal Petroleum University, Gandhinagar, November, 2019. in collaboration with Texas A&M

Journal Reviewer

- Latin American Journal of Solids and Structures (SCI-IF=1.289).
- Journal of Materials Engineering and Performance (SCI-IF=1.652).

Education

- **PhD in Mechanical Engineering**, Indira Gandhi Centre for Atomic Research, HBNI, India, Feb 2011 – Feb 2016.
Thesis: Thermal ratcheting of thin shells: Significance of thermomechanical interactions
Percentage of marks: 75%: Advisor: Dr. P. Chellapandi (Retired)
- **M. Tech in Mechanical Engineering (Production)**, IIT BHU, Varanasi, India, 2007 – 2009.
CGPA: 7.63 : Advisor: Prof. Santosh Kumar
Thesis: Continuous Casting of Aluminum Rod (DST, NEW DELHI SPONSORED)
- **B. Tech in Manufacturing Technology**, JSS Academy of Technical Education, Noida, Affiliated to Uttar Pradesh Technical University, Lucknow, India, 2003 –2007.
Percentage of marks: 62.8%

- **Intermediate (12th):** Boys' high School and College Allahabad, Percentage of marks: 58.8%.
- **High School (10th):** Boys' high School and College Allahabad, Percentage of marks: 71.4%.

Fields of Interest

- Battery thermal modeling, battery abuse testing, battery recycling.
- Mechanics of composites and 3D printed parts.
- Mechanical behavior of metals.
- Macro mechanics of bones and tissues under time dependent and radioactive load.
- Application of mechanics in multidisciplinary field.

Thesis Supervised

M.Tech. 2021: (a) Thermal management of lithium-ion battery (b) Tensile behavior of multi-material 3D printed parts (c) Analysis of signals to detect early muscle fatigue in LBP patients.

M.Tech. 2020: (a) Cyclic hardening behavior of irradiated steels. (b) **Investigation of cyclic behavior of 3D-Printed parts** (c) Assessment and Healing Strategies of Disc bulging in Human Lumbar Spine with EMG.

M.Tech. 2019:(a) Effect of Ionizing Radiation on Bovine Bone. (b) Rate Dependent Behavior of Biological Tissues. (c) Design and Development of Greywater Filtration System (d) Investigation of the Effect of Irradiation on Structural Materials.

PhD (Undergoing): Battery abuse testing and failure assessment.

Projects Undertaken (As part of Education)

- M.Tech (Mini Project) :Computer Application in Electrochemical Machining
- M.Tech (Major Project) :Continuous Casting of Aluminum Rod(**DST, NEW DELHI SPONSORED**)
- B.Tech : Design Module: Tools and Press of Head Light Maruti Gypsy with **LUMAX AutomotiveParts** (Gurgaon, Haryana)

Publications

Book Chapter:

1. A. Mishra, Abhishek Tiwari, Macro-mechanical modeling of 3D printed Material 2020. Materials Forming, Machining and Tribology. Ed.: **Davim**, J. Paul. *Springer*.(Accepted)
2. P. Sharma, P. Pal, A. Mishra, M. Bhandwal, A. Sharma. (2019). A Novel System for Exhaust Emission Reduction of Diesel Engine by Using Electrochemical Technique. In: Saha P., Subbarao P., Sikarwar B. (eds) *Advances in Fluid and Thermal Engineering*. Lecture Notes in Mechanical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-13-6416-7_23.

Patents:

1. A smart temperature measuring system with minimal human intervention: Application No.: 202111020581 (Filed)
2. Smarty Bins – A smart way to manage domestic waste- 201911035770 (Filed)

Journal papers:

1. Taufeeq Ahmad,, Ashutosh Mishra, Subrata Ghosh, and Carlo S. Casari. "Identifying Efficient Cooling Approach of Cylindrical Lithium-Ion Batteries. *Energy Technology* (2021): 2100888. (SCI).
<https://doi.org/10.1002/ente.202100888>
2. Shashi Kala, A. Mishra, (2021) Battery recycling opportunity and challenges in India. *Materials Today: Proceedings*. (Scopus)
(<https://doi.org/10.1016/j.matpr.2021.01.927>).
3. Shashi Kala, A. Mishra and Vishesh Shukla (2020). Battery technologies and its future prospects. *Journal of Indian Chemical Society*, 97, 10a, 1-5 (SCI).
4. Rakesh Kumar, Abhishek Kumar Tiwari, Dharmendra Tripathi, and Ashutosh Mishra (2022). Electromagnetic field induced alterations in fluid flow through lacuno-canalicular system of bone. *International Journal of Mechanical Sciences* 217: 107036.(SCI)
<https://doi.org/10.1016/j.ijmecsci.2021.107036>
5. A. Mishra and Kulbir Singh (2020). Radiation damage modeling of austenitic steels for cyclic loading. *Materials Today: Proceedings*, 43,298-302. (Scopus)
<https://doi.org/10.1016/j.matpr.2020.11.666>.
6. A. Mishra, R. Suresh Kumar,G. Sasikala and P. Chellapandi, (2018). Temperature rate dependent modelling of thermal ratcheting behaviour. *Journal of Structural Engineering (JOSE)*; 45, 1, 67-74. (Scopus).
7. A. Mishra, P. Chellapandi, R. Suresh Kumar and G. Sasikala. Effect of frequency of free level fluctuations and hold time on the thermal ratcheting behavior. *International Journal of Pressure Vessels and Piping*. 2015; 129–130: 1–11. (SCI)
8. A. Mishra, P. Chellapandi, R. Suresh Kumar and G. Sasikala. Effect of Temperature Rate Term while Predicting Thermal Ratcheting of a Thin Cylinder due to Cyclic Temperature Variation. *Transactions of the Indian Institute of Metals*. 2015; 68: 161-169. (SCI)
9. A. Mishra, P. Chellapandi, R. Suresh Kumar and G. Sasikala. Comparative study of cyclic hardening behavior of SS 316L using time independent and dependent constitutive modeling: A simplified semi-implicit integration approach. *Transactions of the Indian Institute of Metals*. 2015; 68; 623-631. (SCI)
10. A. Mishra, R. Suresh Kumar, and P. Chellapandi. Progressive deformation behaviour of thin cylindrical shell under cyclic temperature variation using Combined Hardening Chaboche Model. *Latin American Journal of Solids and Structure*. 2014; 11:980-992. (SCI)
11. A. Mishra, R. Suresh Kumar, G. Sasikala and P. Chellapandi. Influence of the frequency of level fluctuations with reference to progressive deformation of thin cylindrical shell. *Procedia Engineering* 2014; 86:95 –102. (Scopus)
12. A. Mishra, R. Suresh Kumar, and P. Chellapandi. Time dependent ratcheting of thin cylindrical shell due to axial temperature variation using visco-plastic model. *International Journal of Engineering and Technology*. 2014; 6: 234-237. (EI-Inspec).

Conference proceedings:

1. Shashi Kala, A. Mishra, Vishesh Shukla (2020). Battery Technologies and its future prospects. Energy and Environmental Technologies for Sustainable Development (CHEM-CONFLUX2020), Feb 14-16, 2020. MNNIT Allahabad.

2. Henry Isaac, A. Mishra, and Abhishek Kumar Tiwari. Computational assessment of inter vertebral disc bulging with postural change. Indian Conference on Applied Mechanics (INCAM 2019), July, 3-5, 2019, IISc Bangalore.
3. A. Mishra, R. Suresh Kumar, G. Sasikala and P. Chellapandi. Temperature rate dependent modelling of thermal ratcheting behaviour. Indian Conference on Applied Mechanics (INCAM 2017), July 5-7, 2017, MNNIT, Allahabad.
4. A. Mishra, R. Suresh Kumar, G. Sasikala and P. Chellapandi. Significance of thermo-mechanical interaction in thermal ratcheting behavior. 7th International Conference on Creep, Fatigue and Creep fatigue Interaction (CF-7), January 19-22, 2016, Indira Gandhi Centre for Atomic Research, Kalpakkam, India
5. A. Mishra, P. Chellapandi, R. Suresh Kumar and G. Sasikala. Effect of Temperature Rate Term while Predicting Thermal Ratcheting of a Thin Cylinder due to Cyclic Temperature Variation. International Symposium for Research Scholars on Metallurgy, Materials Science and Engineering (ISRS-2014), Dec-11-12, 2014, IITM, India.
6. A. Mishra, R. Suresh Kumar, G. Sasikala and P. Chellapandi. Influence of the frequency of level fluctuations with reference to progressive deformation of thin cylindrical shell. First International conference on Structural Integrity (ICONS-2014), Feb-4-7, 2014, IGCAR, Kalpakkam.
7. A. Mishra, R. Suresh Kumar and P. Chellapandi. Shakedown study of thin cylindrical shell due to moving temperature distribution using Combined Hardening Chaboche Model. Indian Conference on Applied Mathematics (INCAM 2013), 4th-6th July 2013, IIT Madras, India.
8. A. Mishra, R. Suresh Kumar and P. Chellapandi. Simulation of Thermal Ratcheting of thin cylindrical shell due to moving temperature distribution using Combined Hardening Chaboche Model. International Conference on Pressure Vessel and Piping (OPE 2013), 13th-16th February, 2013, Mamallapuram, Chennai, India.

Achievements and Awards

- Awarded DGFS Fellowship by Department of Atomic Energy, Government of India.
- Scored 91.0 Percentile in GATE-2010
- Scored 94.7 Percentile in GATE-2007

References

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Declaration:

The information provided above is true to the best of my knowledge.

Ashutosh Mishra