ASWANI KUMAR BANDARU

IV-245, Department of Applied Mechanics, IIT Delhi, New Delhi, India

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EDUCATION

Ph.D., Applied Mechanics Thesis submitted (12/09/2016)

Indian Institute of Technology Delhi New Delhi, India

- Research Interests: Impact, Characterization of composite materials and Numerical analysis
- Dissertation: "Impact studies on thermoplastic composite armors reinforced with 2D/3D fabrics"

M. Tech., Machine Design May 2009

Indian Institute of Technology Roorkee Roorkee, India

- Dissertation: "Investigation of elasto-plastic fracture behaviour using EFGM"

B. Tech., Mechanical Engineering November 2006

GITAM College of Engineering Visakhapatnam, India

(Affiliated to Andhra University, Visakhapatnam, Andhra Pradesh, India)

- Dissertation: "Finite element analysis of spring and damper assembly"

RESEARCH EXPERIENCE

Doctoral Research: Department of Applied Mechanics, Indian Institute of Technology Delhi, 2011-2016 (research advisor: Prof. Suhail Ahmad)

- Developed an indigenous material system for body armors using in-house experimental facilities from inception to final product which confronts NIJ.STD.Level IIIA bullet (9 mm FMJ).
- Achievement of lightweight composites with weight reduction of 15.67% from homogeneous to hybrid composite armors.
- Manufacturing of 2D and 3D fiber reinforced (Kevlar, basalt and hybrid) composite laminates using compression molding machine.
- Static and dynamic characterization of Kevlar, basalt and hybrid fiber reinforced polymer composites (2D/3D).
- Low velocity impact response of homogeneous and hybrid composites.

- Ballistic impact response of thermoplastic composite armors reinforced with Kevlar, basalt and hybrid fabrics (2D/3D)
- Computational analysis of the influence of hybridization on the ballistic impact response of composite armors.
- High strain rate compression response of composites.

Postgraduate Research: Department of Mechanical and Industrial Engineering, Indian Institute of Technology Roorkee, 2007-2009 (research advisor: Dr. Indra Vir Singh)

- Application of mesh free methods to study the elasto-plastic behavior of a plate with an edge crack.

SKILLS

- ANSYS-AUTODYN, ANSYS, ABAQUS, Unigraphics, Pro-Engineer, Auto-CAD
- Practical experience with Compression Molding Machine (Santec made)
- Hands on experience with Scanning Electron Microscope (Hitachi, TM-3000), Density measurement and Volume fraction measurement

GRANTS AND HONORS

- Ministry of Human Resources Development (MHRD) fellowship, Government of India July 2011-July 2016
- Selected as 2nd best Ph.D thesis out of 23 departments across the institute (IIT Delhi) 2016
- 1st prize, Open House 2016, Department of Applied Mechanics (IIT Delhi) 2016
- Appreciation certificate for organizing the Open House at Applied Mechanics Department IIT Delhi April 2012- April 2015
- Zwick Science Award, Zwick & GmbH & Co. KG 2014
- Selected for JENESYS 2.0 (Japan-East Asia Network of Exchange for Students and Youths) program June 2014
- CSIR International travel support (under young scientist scheme) June 2013
- MHRD fellowship, Government of India July 2007-April 2009
- Department of School Education and Literacy, MHRD sponsored program, Jawahar Navodaya Vidyalaya, Ongole, Andhra Pradesh July 1995-April 2002

- Rajya Puraskar (The Bharat Scouts and Guides) from Dr. C. Rangarajan, Governor of Andhra Pradesh May 2000

PROFESSIONAL BACKGROUND (Total experience ~ 8 years)

- Research Assistant, Development of light-weight ballistic materials system for body, vehicle and structural armors, Department of Mechanical Engineering, Indian Institute of Technology Delhi 15/09/2016 – till date
- Teaching Assistant, Department of Applied Mechanics, Indian Institute of Technology Delhi August 2011-2016
- Assistant Professor, Department of Mechanical Engineering, GMR Institute of Technology Rajam, Andhra Pradesh, India Feb 2010-June 2011
- Teaching Assistant, Department of Mechanical and Industrial Engineering, Indian Institute of Technology Roorkee 2008-2009

Guidance of M.Tech thesis at IIT Delhi

- Vijay Kumar Mittal: Static shear and dynamic compression response of thermoplastic 2D/3D composites, July 2016-Till date. (Scientist from DRDO)
- Krishnan Kumar Gupta: Material characterization of thermoplastic composites for light weight body armor, August 2015-June 2016.
- Laxman P: Reliability analysis of light weight composite for Body armors under high velocity impact, August 2014-June 2015.
- Rajat Kapoor: Fabrication and dynamic property characterization of Kevlar-polymer composite for light weight armor, August 2014-June 2015. (Engineer from Honda Motors)
- Yogesh Sachan: Basalt based composites for impact applications, August 2014-June 2015.
- Lakshmi V M: Risk Assessment of ballistic impact on body armors, August 2013-June 2014.
- Deepesh Thakur: High velocity impact behaviour of composite materials, August 2013-June 2014.
- Vikrant V Chavan: Studies on composites with 3D woven preforms and micro-cellular matrix for high velocity impact applications, August 2013-June 2014.
- Manjulata Bhatti: Ballistic impact on composite plate, August 2011-June 2012.

INSTITUTE SERVICE AND AFFILIATIONS

- Overall Student Coordinator: Indian Conference on Applied Mechanics (INCAM 2015), IIT Delhi, July 13-15, 2015
- Coordinator: Open House April 2012-2015
- Overall Student Coordinator: Internal Review Committee, February 2013
- Coordinator: Third Asian Conference on Mechanics of Functional Materials and Structures (ACMFMS 2012), IIT Delhi, December 05-08, 2012
- Membership: ASME, IAENG

JOURNALS

Ph.D

1. **Aswani Kumar Bandaru**, Shivdayal Patel, Yogesh Sachan, R. Alaigurusamy, Naresh Bhatnagar and Suhail Ahmad: **2016**, Mechanical behavior of 3D angle-interlock Kevlar/basalt reinforced polypropylene composites, **Polymer Testing**, 55:238-246. **(IF: 2.350)**
2. **Aswani Kumar Bandaru**, Shivdayal Patel, Yogesh Sachan, R. Alaigurusamy, Naresh Bhatnagar and Suhail Ahmad: **2016**, Mechanical behavior of Kevlar/basalt reinforced polypropylene composites, **Composites Part A: Applied Science and Manufacturing**, 90:642-652. **(IF: 3.719)**
3. **Aswani Kumar Bandaru**, Shivdayal Patel, Yogesh Sachan, R. Alaigurusamy, Naresh Bhatnagar and Suhail Ahmad: **2016**, Low velocity impact response of 3D angle-interlock Kevlar/basalt reinforced polypropylene composites, **Materials and Design**, 105:323-332. **(IF: 3.997)**
4. **Aswani Kumar Bandaru**, Vikrant V Chavan, Suhail Ahmad, R. Alaigurusamy, and Naresh Bhatnagar: **2016**, Low velocity impact response of 2D and 3D Kevlar/Polypropylene composites, **International Journal of Impact Engineering**, 93:136-143. **(IF: 2.646)**
5. **Aswani Kumar Bandaru** and Suhail Ahmad: **2016**, Modeling of progressive damage for composites under ballistic impact, **Composites Part B: Engineering**, 93:75-87. **(IF: 3.850)**
6. **Aswani Kumar Bandaru**, Vikrant V Chavan, Suhail Ahmad, R. Alaigurusamy, and Naresh Bhatnagar: **2016**, Ballistic impact response of Kevlar reinforced thermoplastic composite armors, **International Journal of Impact Engineering**, 89:1-13. **(IF: 2.646)**
7. Rajat Kapoor, Laxman Pangeni, **Aswani Kumar Bandaru**, Suhail Ahmad and Naresh Bhatnagar: **2016**, High strain rate compression response of woven Kevlar reinforced polypropylene

composites, **Composites Part B: Engineering**, 89:374-382. (**Corresponding author) (IF: 3.850)**

8. **Aswani Kumar Bandaru**, Lakshmi Vetiyatil and Suhail Ahmad: **2015**, The effect of hybridization on the ballistic impact behavior of hybrid composite armors, **Composites Part B: Engineering**, 76:300-319. **(IF: 3.850)**
9. **Aswani Kumar Bandaru** and Suhail Ahmad: **2015**, Effect of projectile geometry on the deformation behavior of Kevlar composite armors under ballistic impact, **International Journal of Applied Mechanics**, 7(3):1550039(1-23). **(IF: 1.468)**
10. **Aswani Kumar Bandaru**, Shivdayal Patel, Suhail Ahmad and Naresh Bhatnagar: 2016, Behavior of 2D woven Kevlar/basalt reinforced thermoplastic hybrid composites under low velocity impact, **Composites Part A: Applied Science and Manufacturing. (Under review)**
11. **Aswani Kumar Bandaru** and Suhail Ahmad: **2016**, Ballistic impact performance of hybrid thermoplastic composite armors reinforced with 2D/3D Kevlar and basalt fabrics, **Composites Part A: Applied Science and Manufacturing. (Under review)**

M.Tech

1. **Aswani Kumar Bandaru**, Ch. Raghuveer, M. Vijaya Sekhar Babu and K.M.K Chowdary: **2011**, Simulation and numerical investigation of elasto-plastic analysis of an edge crack using FEM and EFGM, **International Journal of Theoretical and Applied Mechanics**, 6(1):89-101.
2. P.K. Jain, Balajipadya, P. S. Rao, K. Mohana Krishna Chowdary, **Aswani Kumar Bandaru** and G. Anusha: 2011, Thermal and mechanical properties of multiscale carbon nanotubes and carbon fiber reinforcement in epoxy hybrid nanocomposites, **Journal of Nanostructured Polymers and Nanocomposites**, 7(3):81-86.

CONFERENCES

1. **Aswani Kumar Bandaru** and Suhail Ahmad: **2016**, Ballistic impact behaviour of thermoplastic Kevlar composites: Parametric studies, 11th International Symposium on Plasticity and Impact Mechanics, **(IMPLAST 2016),** Indian Institute of Technology Delhi, New Delhi India, Dec-2016. **(Accepted)**
2. **Aswani Kumar Bandaru**, Yogesh Sachan, Suhail Ahmad and Alagirusamy R: **2015**, Low velocity impact response of basalt reinforced Ultem (PEI) composites, 23rd Annual International Conference on Composites or Nano Engineering **(ICCE 23)**, Southwest Jiaotong University, Chengdu, China.

3. **Aswani Kumar Bandaru** and Suhail Ahmad: **2015**, A numerical study of the influence of dynamic compression modulus on the ballistic impact response of Kevlar/Polypropylene composites, Proceedings of the International Conference on Computer Aided Engineering **(CAE 2015)**, Department of Mechanical Engineering, GITAM University, School of Technology, Hyderabad, India.
4. **Aswani Kumar Bandaru** and Suhail Ahmad: **2015**, A computational analysis of the ballistic impact performance of Kevlar/Polypropylene composite armors, Proceedings of the International Conference on Computer Aided Engineering **(CAE-2015)**, Department of Mechanical Engineering, GITAM University, Hyderabad, India.
5. **Aswani Kumar Bandaru,** Yogesh Sachan and Suhail Ahmad: **2015**, A comparative study on the low velocity impact response of single layer fabrics, Indian National Conference on Applied Mechanics **(INCAM 2015)**, IIT Delhi, New Delhi, India.
6. Rajat Kapoor, Laxman Pangeni, **Aswani Kumar Bandaru** and Suhail Ahmad: **2015**, High strain rate compression response of thermoplastic composite laminates made from Kevlar fabric and polypropylene matrix, Indian National Conference on Applied Mechanics **(INCAM 2015)**, IIT Delhi, New Delhi, India.
7. **Aswani Kumar Bandaru** and Suhail Ahmad: **2014**, A ballistic material model for Kevlar/epoxy Composite targets, Proceedings of the 5th International Congress on Computational Mechanics and Simulation **(ICCMS 2014)**, CSIR-Structural Engineering Research Centre, Chennai, Pp.2432-2439.
8. **Aswani Kumar Bandaru** and Suhail Ahmad: **2013**, Numerical simulation of progressive damage of laminated composites under ballistic impact, Proceedings of the 11th International Conference on Structural Safety and Reliability **(ICOSSAR 2013)**, Columbia University, New York, USA.
9. **Aswani Kumar Bandaru** and Suhail Ahmad: **2013**, Prediction of BFS in composite armors under ballistic impact, 17th International Conference on Composite Structures **(ICCS17)**, University of Porto, Portugal.
10. **Aswani Kumar Bandaru** and Suhail Ahmad: **2013**, Damage and Reliability Assessment of Composites under High Velocity Impact, Proceedings of the Indian Conference on Applied Mechanics **(INCAM 2013)**, IIT Madras, Tamilnadu, India.
11. **Aswani Kumar Bandaru** and Suhail Ahmad: **2013**, Ballistic impact performance of layered composite targets, 4th Indo-Russian Workshop on Topical problems in Theoretical and Applied Mechanics, IIT Madras, Tamilnadu, India.

12. **Aswani Kumar Bandaru**, I .V Singh, and V. H Saran: **2009**, Elasto-Plastic EFGM analysis of an edge crack, Proceedings of the World Congress on Engineering **(WCE 2009)**, London, U.K. Vol II, Pp. 1447-1451.

BOOK CHAPTERS

1. **Aswani Kumar Bandaru** and Suhail Ahmad: **2016**, A comparative study on the low velocity impact response of single layer fabrics, Mechanics of Solids, Fluids and Materials, Narosa Publishing House, New Delhi, India.
2. Rajat Kapoor, Laxman Pangeni, **Aswani Kumar Bandaru** and Suhail Ahmad: **2016**, High strain rate compression response of thermoplastic composite laminates made from Kevlar fabric and polypropylene matrix, Mechanics of Solids, Fluids and Materials, Narosa Publishing House, New Delhi, India.
3. **Aswani Kumar Bandaru** and Suhail Ahmad: **2014**, Numerical simulation of progressive damage of laminated composites under ballistic impact, Safety, Reliability, Risk and Life-Cycle Performance of Structures and Infrastructures, CRC Press, Pp. 4375-4382.
4. **Aswani Kumar Bandaru** and Suhail Ahmad: **2013**, Ballistic impact performance of layered composite targets, Topical problems in Theoretical and Applied Mechanics, Elite Publishing House Pvt. Ltd., India. Pp. 240-247.

REVIEWER

- Composites Part B: Engineering, ELSEVIER
- Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture, SAGE
- Journal of Aerospace Engineering, ASCE Library
- International Journal of Applied Mechanics, World Scientific
- Latin American Journal of Solids and Structures
- Bio Resources

BOOK

- **Aswani Kumar Bandaru** and Ch. Raghuveer, Investigation of Elasto-Plastic fracture behaviour using EFGM, LAMBERT Academic Publishing (LAP), Germany.

PERSONAL INFORMATION

Date of Birth: 29-08-1985

Marital status: Married

Languages: English, Hindi and Telugu

REFERENCES

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