Dr. Indra Vir Singh

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Research Interests

- FEM, XFEM, Isogeometric Analysis, Meshfree Methods;
- Nonlinear and Multi-scale Simulations, Large Deformation Analysis;
- Fracture Mechanics, Fatigue, Damage Mechanics, FGMs, Composites;

Educational Qualifications

S.No.	Class/Degree	School/College/University	Year
1.	B.Sc. Engg. (Mechanical)	A.M.U. Aligarh	1996
2.	M.Tech. (Applied Mechanics)	I.I.T. Delhi	1998
3.	Ph.D. (Mechanical)	BITS, Pilani	2004

Professional Experience

S.No.	Position Held	College/University	Responsibility	From	To
1.	Research Associate	IIT Delhi, India	Research	02,1999	05/1999
2.	Lecturer	BITS, Pilani, India	Teaching/Research	05/1999	07/2005
3.	Postdoctoral Researcher	Shinshu University Nagano, Japan	Research	09/2005	03/2007
4.	Assistant Professor	IIT Roorkee, India	Teaching/Research	04/2007	10/2012
5.	Associate Professor	IIT Roorkee, India	Teaching/Research	10/2012	Till Date

Publications

	Published/Accepted	In-Review	Total
Journals	**86**	**2**	**88**
Conference/Symposium	**80**	**0**	**80**
Total	**166**	**2**	**168**

Thesis/Dissertation Guidance

	Completed/Submitted	In-Progress	Total
Ph.D.	**7**	**6**	**13**
M. Tech.	**43**	**1**	**44**

Computer/Software Skills

- ***Software Packages*:** ANSYS, ABAQUS, SolidWorks
- ***Computer Languages*:** MATLAB, FORTRAN, C

Membership

- Indian Association for Computational Mechanics
- Indian Society of Theoretical and Applied Mechanics
- International Association of Engineers

Honors, Awards and Fellowships

- Selected for Marquis's Who's Who in the World, 2005, 2007, 2008, 2009, 2010, 2011, 2012.
- Sir Rajendra Nath Mookherjee Memorial Best Paper Award by Institution of Engineers, 2007.
- Ministry of Human Resource Development, New Delhi, GATE Fellowship, 1997-1998.
- Merit Scholarship during Bachelor Degree Course, 1993-1996.
- Merit Scholarship from Class IX to XII.

Foreign Visits

- **Japan** (Shinshu University, Nagano), **Postdoctoral Researcher** from **September 2005 – March, 2007**.
- **USA** (Los Angeles, California) to present a paper in 7th World Class Congress on Computational Mechanics, **July 16 – 22**, **2006.**
- **Canada** (Vancouver) to chair a session in 9th International ASTM/ESIS Symposium on Fatigue and Fracture Mechanics (37th ASTM National Symposium on Fatigue and Fracture Mechanics), **May 20 – 22, 2009.**
- **South Korea**, Korea Railroad Research Institute, Uiwang City, **June 22 – July 21, 2009**.
- **Germany** (Aachen) to present a paper in ECCOMAS Thematic Conference on the XFEM, **September 28 – 30**, **2009**.
- **South Korea**, Korea Railroad Research Institute, Uiwang City, **June 14 – July 03, 2010**.
- **Portugal** (University of Aveiro), Indo-Portugal joint research project, **June 14 – 21**, **2011.**
- **UK** (Cardiff University), to present a paper in 2nd International Conference on Extended Finite Element Method, **June 29 – July 01**, **2011.**
- **Singapore** (National Technological University), to present paper in Eleventh Asia-Pacific Conference on Engineering Plasticity and Its Applications (AEPA2012), **December 5-7**, **2012**.
- **Germany** (Ulm), International Forum for Testing Materials, Zwick, Ulm, **October 14-17, 2013**.
- **France** (Ensta Paris Tech), to present paper in Multi-physics Modeling of Solids (MPMS), An International Colloquium, Paris, France, **October 6-8**, **2014**.
- **Australia**, Deakin University, Warun Ponds Campus, Geelong, Australia, **June 15-19**, **2015**.

Invited Lectures

- Meshfree Methods in Engineering, BARC Mumbai, India, June 30 **–** July 1, **2007**.
- Meshfree Methods, Short Term Course on "Computational Fluid Dynamics" by Dr. B.K. Gandhi and Dr. K. M. Singh, IIT Roorkee, June 23, **2008**.

- Handling of Strong Discontinuities by Element Free Galerkin Method, Korea Railroad Research Institute, Uiwang City, South Korea, July 2, **2009**.
- Two-dimensional Finite Element Analysis, Short Term Course on "Computer Aided Design" by Dr. P. M. Pathak and Dr. B. K. Mishra, IIT Roorkee, December 22, **2009**.
- Meshfree Methods in Heat Transfer, BARC Mumbai, India, March 4–5, **2010.**
- Modeling and Simulation of Strong Discontinuities by XFEM**,** Korea Railroad Research Institute, Uiwang City, South Korea, June 28, **2010**.
- Fracture Mechanics Simulations using Meshfree Method, Meshfree Conference, IISc Bangalore, India, January 10–11, **2011**.
- Numerical Simulations of Fracture Mechanics Problems using Meshfree Methods, University of Aveiro, Portugal, June 20, **2011**.
- Finite Element Methods: Fundamentals, DEAL, Dehradun, June 5-6, **2012**.
- Three-Dimensional Fracture Mechanics Simulations Using Extended Finite Element Method, *Fourth International Conference on Structural Stability and Dynamics (ICSSD)*, MNIT, Jaipur, India, Vol. 2, pp. 863–877, January 4–6, **2012**.
- Finite Element Methods for Solid Mechanics Problems, MNIT, Jaipur, June 4-5, **2013**.
- Composites: Introduction, Mechanics and Failure Analysis, MNIT, Jaipur, June 14, **2013**.
- Introduction to Meshfree Methods and Extended Finite Element Methods, IIT Mandi, July 4, **2013**.
- Introduction to Finite Element Methods, GNDEC, Ludhiana, TEQIP sponsored STC, July 22, **2013**.
- Finite Element Analysis, DCRUST, Murthal, TEQIP sponsored STC, September 25, **2013.**
- Finite Element Methods and Its Applications, DEAL, Dehradun, December 16, **2013.**
- Finite Element Methods, DTU, Delhi, June 10, **2014.**
- Introduction to Meshfree, XFEM and Isogeometric Analysis, IIT Mandi, HP, June 27, **2014**.
- Meshfree Methods and Applications, NIT Patna, March 23-34, **2015**.
- Numerical Simulations of Fracture Mechanics Problems by XFEM, IISc Bangalore, May 29, **2015.**
- Advanced Numerical Simulations for Fatigue-fracture problems, Deakin University, Australia, June 18, 2015

Special Issue

- Chief Editor for Recent Advances in Computational Mechanics (RACM), **http://www.hindawi.com/journals/ame/si/915485/**

New Courses Developed

- Extended Finite Element Method at IIT Roorkee

Session Chair

- Chaired a Session in Interquadrennial Conference of the International Congress of Fracture **(IQICF)**, IISc Bangalore, India, August 3–7, **2008**.
- Chaired a Session in Ninth International ASTM/ESIS Symposium on Fatigue and Fracture Mechanics (37th ASTM National Symposium on Fatigue and Fracture Mechanics), Vancouver, Canada, May 20–22, **2009.**
- Chaired a session in Meshfree Conference, IISc Bangalore, India, January 10–11, **2011**.

- Chaired a session in Fourth International Conference on Structural Stability and Dynamics (ICSSD 2012), MNIT Jaipur, India, January 4–6, **2012**.

Conference Organized

- Joint Organizing Secretary, 1st International and 16th National Conference on Machines and Mechanism, IIT Roorkee, December 18-20, **2013.**

Short Term Course Organized

- Organized a short term course (under QIP scheme) on "Design and Analysis using FEM, XFEM and Meshfree Methods" July 12 **–** 16, **2010**.
- Organized a short term course on "Simulation and Design using Extended Finite Element Method (XFEM)" December 13 **–** 17, **2010**.
- Organized a short term course on "Modeling and Simulations using Meshfree Methods" May 23 **–** 27, **2011**.
- Organized a short term course on "Numerical Simulations Using FEM, XFEM and Meshfree Methods" December 24 **–** 28, **2012**.
- Organized a short term course on "Fatigue and Fracture of Advanced Materials" July 20 **–** 23, **2013**.
- Organized a short term course (under QIP scheme) on "Modeling and Simulations using Finite Element Methods" January 7 **–** 11, **2014**.
- Organized one day workshop (under QIP scheme) on "Failure Analysis and Life Assessment", March 14, **2015**.

Books/Monographs

- Akhilendra Singh and Indra Vir Singh, Element Free Galerkin Methods for Heat Transfer: Fundamentals and Formulations, Lambert Academic Publisher, Germany, **July 2010**.

Sponsored Research Projects

S. N.	Title	Funding Agency	Duration	Amount (lakhs)	PI/Co-PI	Status
1.	Development of Elasto-Plastic Element Free Galerkin Code	BRNS, DAE, Mumbai, India	3 years (April 2008–Dec 2011)	17.24	Dr. B. K. Mishra (Co-PI)	Completed
2.	Thermo-mechanical Simulations of Elasto-Plastic Fracture Mechanics Problems Using XFEM and Meshless Methods	Indo-Portugal Joint Research Project, DST, New Delhi	3 years, January 2011–December 2013	4.57	Dr. B. K. Mishra (Co-PI)	Completed
3.	Mechanical Behavior of Ultrafine grained Zr and Zr-Nb alloys Processed by Cryorolling (Experimental & Simulation Studies)	BRNS, DAE, Mumbai, India,	3 years (July 2011–June 2014)	48.15	Dr. R. Jayagantan (PI)	Completed
4.	Prediction of Graphite Failure Strength using RVE Approach and XFEM	BRNS, DAE, Mumbai, India	3 years (August, 2014 - August, 2017)	24.58	Dr. B. K. Mishra (Co-PI)	In-progress
5.	Failure Analysis of Engineering Components of Intricate Shape using Extended Isogeometric Analysis	DST, New Delhi, India	3 years (Sep, 2014 - Sep, 2017)	19.50	Dr. B. K. Mishra (Co-PI)	In-progress
6.	Simulation of High Temperature Elasto-plastic Fatigue Crack	DMRL, DRDO, Hyderabad,	3 years (Nov, 2014 -	29.78	Dr. B. K. Mishra	In-progress

	Growth using XFEM	India	Nov, 2017)		(Co-PI)	
7.	Experimental and Numerical Studies on Cold Swaging of Zr alloy Bars for End Cap Component Manufacturing in PHWR Assemblies	BRNS, DAE, BARC, Mumbai	3 years (2016 - 2018)	45.00	Dr. R. Jayagantan (PI)	Approved

Consultancy Projects

S. N.	Title	Funding Agency	Duration	Amount (lakhs)	Status
1.	Design Vetting of Erection Base for Rotor of 800 MW Turbogenerator Used for Rotor Insertion into Stator	BHEL Haridwar, India	November, 2007–July, 2008	6.5	Completed
2.	Design Development of Fixture for Road Transport of Stator of 800 MW Turbo-generator	BHEL Haridwar, India	November, 2007–August, 2008	9.3	Completed
3.	Design Analysis and Weight Optimization of Cast Steel Bogies of Freight Stock on Indian Railways	Ministry of Railway, RDSO, Lucknow, India	January 2011-March 2013	12.7	Completed
4.	Development of XFEM Software for the Simulation of Fracture and Ductile Crack Tearing in Nuclear Components	BARC, Mumbai, India	January 2011–August 2013	23.0	Completed
5.	Development of Meshfree Codes for the Simulation of Damage in Metallic Materials Used in Nuclear Industries	BARC, Mumbai, India	April 2012–September 2015	22.0	In-progress

Ph.D. Guidance

S.N.	Name of R/S	Thesis Title	Co-guide (if any)	Funding (FT or PT)	Month & Year of Completion
1.	Manish Goyal	*Creep Fatigue Crack Modeling Using XFEM*	---	MHRD (FT)	In Progress
2.	Sunil Kumar Singh	*Failure Analysis of Intricate Shapes Using XIGA*	---	DST Project (FT)	In Progress
3.	Manik Bansal	*Prediction of Graphite Failure Strength Using RVE Approach and XFEM*	---	BARC Project (FT)	In Progress
4.	Rangoli Goyal	*Numerical Simulation of Transport Phenomena & Mechanics Problems using Advanced FE Techniques*	Prof. Rama Bhargava	CSIR (FT)	In Progress
5.	Amit Shedbale	*Numerical Simulation of Nonlinear Fracture Problems using Coupled FE-EFG/XFEM*	---	MHRD (FT)	In Progress
6.	Gagandeep Bhardwaj	*Fatigue Crack Growth Simulations using Extended Isogeometric Analysis*	---	MHRD (FT)	In Progress

7.	Sachin Kumar	*Crack Growth Simulations in Ductile Materials using XFEM/Coupled FE-EFGM*	Prof. B. K. Mishra	MHRD (FT)	August, 2015
8.	Sunkalp Goel	*Experimental and Simulation Studies of Ultrafine Grained Zr and Zr-Nb Alloys Processed by Cryo-rolling*	Prof. R. Jayaganthan	Project (FT)	August, 2015
9.	Kamal Sharma	*Numerical Simulation of Crack Growth Problems Using EFGM/XFEM*	Prof. B. K. Mishra	BARC (PT)	April, 2015
10.	Vineet Kumar	*An Investigation of Mechanical and Fracture Behavior of Ultrafine Grained 6082 Al alloy*	Prof. B. K. Mishra	MHRD (FT)	February, 2015
11.	Somnath Bhattacharya	*Numerical Simulation of Fatigue Fracture in Functionally Graded Materials using XFEM*	Prof. B. K. Mishra	MHRD (FT)	July, 2012
12.	Rajesh K. Sharma	*Simulation of Transport Phenomena in Porous Media*	Prof. Rama Bhargava	MHRD (FT)	June, 2011
13.	Mohit Pant	*Simulation of Fracture Mechanics Problems under Thermo-Mechanical Loading*	Prof. B. K. Mishra	MHRD (FT)	Dec, 2010

M.Tech. Guidance

S. N.	Candidate Name	Dissertation Title	Co-guide (if any)	Month & Year of Completion
1.	Aakash Bhuwal	*Elasto-plastic Crack Growth Simulation using XFEM*	Prof. B. K. Mishra	June, 2015
2.	Amit Kumar Sharma	*Modeling and Simulation of Nonlinear Problems Using XFEM*	Prof. B. K. Mishra	June, 2015
3.	Rajat Pratap	*Modelling and Simulation of Nuclear Graphite using XFEM*	Prof. B. K. Mishra	June, 2015
4.	Kirti Sharma	*Modelling and Simulation of Solid Mechanics Problems using Isogeometric Analysis*	Prof. B. K. Mishra	June, 2015
5.	Tarun Sachdeva	*Modeling and Finite Element Simulation of Smart Structures*	---	June, 2015
6.	Rajwinder Singh	*Mechanical Behavior of Aluminum Alloys: Experimental Study & Simulation*	Prof. R. Jayaganthan	June, 2014
7.	Shantanu Kumar Das	*Experimental Investigation and Numerical Simulation of Accumulative Roll Bonded 5080 Aluminium Alloy*	Prof. B. K. Mishra	June, 2014
8.	Suneel Kumar Sharma	*Nonlinear Simulation of Solid Mechanics Problems Using EFGM/XFEM*	Prof. B. K. Mishra	June, 2014
9.	Virender Kumar	*Numerical Simulation of Cracked Plate Using Isogeometric Analysis*	Prof. B. K. Mishra	June, 2014
10.	Yogesh Bisht	*Multiscale Modelling of Nuclear Graphite Using XFEM*	Prof. B. K. Mishra	June, 2014

11.	Amit Kumar	*Crack Growth Simulation in Laminated Composite Using FEM*	---	Dec., 2013
12.	Subrato Sarkar	*Extended Isogeometric Finite Element for the Simulation of Fracture Mechanics Problems*	Prof. B. K. Mishra	Dec., 2013
13.	Amit Shedbale	*Numerical Analysis of Nonlinear Solid Mechanics Problems Using XFEM*	Prof. B. K. Mishra	June, 2013
14.	Azher Jameel	*Numerical Simulation of Contact Problems Using XFEM/EFGM*	Prof. B. K. Mishra	June, 2013
15.	Sushil Kumar Maurya	*Crack Growth Analysis and Weight Optimization of Railway Casnub Bogie By Using FEM*	Prof. B. K. Mishra	June, 2013
16.	Pramod Kumar	*3-D Simulation of Interpenetrating Phase Composites By FEM/EFGM*	Prof. B. K. Mishra	June, 2013
17.	Vivek Kumar Sharma	*Numerical Simulation of Branched and Intersecting Cracks in the Presence of Multiple Discontinuities Using XFEM*	Prof. B. K. Mishra	June, 2013
18.	Kumar Gaurav	*Elasto-plastic Fracture and Fatigue Simulation Using FEM/XFEM*	Prof. R. Jayaganthan	June, 2013
19.	A. Raja	*Experimental and Numerical Simulation of Ultrafine Grained Zr-alloys*	Prof. R. Jayaganthan	June, 2013
20.	Ankit Agarwal	*Failure Analysis of Interpenetrating Phase Composites by Meshfree Methods*	Prof. B. K. Mishra	June, 2012
21.	Anil Kumar Sahoo	*Multi-scale modeling and simulation of 3D-Braided Composites Using FEM/XFEM*	Prof. B. K. Mishra	June, 2012
22.	Rajesh Kumar	*Numerical Simulation of Elasto-Plastic Large Deformation Problems Using FEM/EFGM*	Prof. B. K. Mishra	June, 2012
23.	Pravin Kumar	*An Isogeometric Approach for the Simulation of Solid Mechanics Problems*	Prof. B. K. Mishra	June, 2012
24.	Ravi Sewak	*Process Modeling of ECH with FEM*	Prof. P. K. Jain	June, 2012
25.	Saurabh Kumar Yadav	*Numerical simulation of 3-D cracks using XFEM*	---	June, 2011
26.	Mangesh Brahamnkar	*Numerical simulation of 3-D fracture mechanics problems using EFGM*	Prof. B. K. Mishra	June, 2011
27.	Roshan U. Patil	*Numerical simulation of 2-D fracture mechanics problems using XFEM*	Prof. B. K. Mishra	June, 2011
28.	Anurag Tiwari	*Mechanical behavior of ultrafine grained aluminium 2014 alloy*	Prof. R. Jayaganthan	June, 2011
29.	Prosenjit Das	*Mechanical properties and fracture studies of UFG 7075 Al alloy under different loads (Experimental and Simulation Studies)*	Prof. R. Jayaganthan	June, 2010
30.	Sumit Vispute	*Numerical simulation of fatigue crack problems using element free Galerkin method*	Prof. B. K. Mishra	June, 2010
31.	Gurwinder Singh	*The simulation of multiple cracks in welded structure using element free Galerkin method*	Prof. V. H. Saran	June, 2010
32.	Lalit Kralia	*Fracture studies of UFG Al-alloys*	Prof. P. M. Pathak	June, 2010
33.	Rinkel	*Development and characterization of Diopside*	Prof. R.	June, 2010

		($CaMgSi_2O_6$) - Jadeite ($NaAlSi_2O_6$) based Glass-Ceramics	Jayaganthan, Dr. R. Conradt	
34.	Bandaru Aswani Kumar	*Investigation of elasto-plastic fracture behaviour using EFGM*	Prof. V. H. Saran	June, 2009
35.	Ch. Raghuveer	*The numerical simulation of bi-material problems using meshfree methods*	Prof. B. K. Mishra	June, 2009
36.	Rajeev Kumar	*Finite element simulation for the optimization of parameters in continuous casting of slabs*	Prof. P. K. Jha	June, 2009
37.	Sumit Kumar	*XFEM simulation of 2-D fracture mechanics problems*	----	June, 2009
38.	Ashok Boda	*Vibration analysis of single walled carbon nanotube (SWCNT) based mass sensor*	Prof. S. P. Harsha	June, 2008
39.	Gorla Lokeshwari	*Evaluation of the mechanical properties of carbon nanotube composites by finite element analysis*	Prof. S. P. Harsha	June, 2008
40.	Ravi Aher	*Analysis of edge crack problem using meshfree method*	---	June, 2008
41.	Amit Umdekar	*Application of meshless element free Galerkin method to three-dimensional heat transfer problems*	---	May, 2003
42.	Avinash Masurkar	*Solution of heat transfer problems using meshless EFG method*	---	May, 2003
43.	Parul Jain	*Parallelization of meshless element free Galerkin method in fluid flow problems*	---	May, 2003

B.Tech. Project Guidance

S. No.	Students Name	Project Title	Co-guide (if any)	Month & Year of Completion
1.	Ankit Rathore, Suyash Patel, Ajay Meena	*Fixture and Specimen Design for Biaxial Load Testing*	---	May, 2014
2.	Prashant Kumar, Rahul Rajpoot, Pranav Bajpai	*Modeling and Simulation of Indian Railway BOXNHL Wagon*	---	May, 2014
3.	Ravneet Singh, Rumanuddin Qureshi, Basvoju Abhinay	*Multi Scale Modeling and Simulation of 3D Braided Fibre Reinforced Composites Without and With CNT's*	---	May, 2013
4.	Md. Asim Ali, Abhinav Kesri, Sarvesh Sonwani	*Modeling and Simulation of Natural Fibre Composites*	---	May, 2013
5.	Manpreet Singh, Nirbhay Agarwal, Raman Goyal	*Study and Testing of Mechanical Behaviour of Forged Aluminum 6082 Alloy*	---	May, 2013
6.	Ayush Bansal, Keshav Sehgal, Mayank Doda	*Modelling, Simulation and Weldment Optimization of Indian Railway Wagon*	---	May, 2013

7.	Atul Kumar Bansal, Suresh Kumar Meena and Vivek Kumar	*Experimental Analysis and Simulation of Fracture and Fatigue in 6082 Aluminum Alloy*	---	May, 2012
8.	Apoorv Sharma, and Nitin Jain	*Failure Analysis of Low Alloy High Strength Steels by Finite Element Method*	Dr. V. K. Tiwari	May, 2010
9.	Sudheer Chaudhary and Vidit Gaur	*A Numerical Study-Thermal Cracking in Disc Brakes*	---	May, 2010

Reviewer for the Journals

- Computational Mechanics
- Computer Methods in Applied Mechanics and Engineering
- International Communications for Numerical Methods in Engineering
- Computational Material Science
- International Journal of Computational Methods
- International Journal of Fatigue
- International Journal of Mechanical Sciences
- Engineering Fracture Mechanics
- Applied Mathematics and Computation
- Simulation Modelling Practice and Theory
- ASME Journal of Fluids Engineering
- International Journal of Thermal Science
- International Journal of Heat and Mass transfer
- Heat and Mass Transfer
- Numerical Heat Transfer

Courses Taught

- Mechanics of Materials/Solid Mechanics
- Advanced Mechanics of Solids
- Machine Design
- Finite Element Methods
- Engineering and Machine Drawing

Journal Publications

1. G. Bhardwaj, I.V. Singh, B.K. Mishra, Fatigue Crack Growth in Functionally Graded Material using Homogenized XIGA, *Composite Structures* (Accepted).
2. Himanshu Pathak, Akhilendra Singh, **I.V. Singh**, S.K. Yadav, Fatigue Crack Growth Simulations of 3-D Linear Elastic Cracks under Thermal Load by XFEM, *Frontiers of Structural and Civil Engineering* (Accepted).
3. Sachin Kumar, A.S. Shedbale, **I.V. Singh**, B.K. Mishra, Elasto-Plastic Fatigue Crack Growth Analysis of Plane Problems in the Presence of Flaws Using XFEM, *Frontiers of Structural and Civil Engineering* (Accepted).
4. A.S. Shedbale, **I.V. Singh**, B.K. Mishra, K. Sharma, Evaluation of Mechanical Properties using Spherical Ball Indentation and Coupled FE-EFG Approach, *Mechanics of Advanced Materials and Structures* http://dx.doi.org/10.1080/15376494.2015.1029171

5. G. Bhardwaj, **I.V. Singh**, B.K. Mishra, Virender Kumar, Numerical Simulations of Cracked Plate using XIGA under Different Loads and Boundary Conditions, *Mechanics of Advanced Materials and Structures* http://dx.doi.org/10.1080/15376494.2015.1029159
6. S. Kumar, **I.V. Singh,** B.K. Mishra, A. Singh, New Enrichments in XFEM to Model Dynamic Crack Response of 2-D Elastic Solids, *International Journal of Impact Engineering* http://dx.doi.org/10.1016/j.ijimpeng.2015.03.005
7. Himanshu Pathak, Akhilendra Singh, **I.V. Singh**, M. Brahmankar, Three-Dimensional Stochastic Quasi-Static Fatigue Crack Growth Simulations Using Coupled FE-EFG Approach, *Computers and Structures*, Vol. 160, pp. 1-19, **2015**.
8. G. Bhardwaj, **I.V. Singh**, Fatigue Crack Growth Analysis of a Homogeneous Plate in the Presence of Multiple Defects using Extended Isogeometric Analysis, *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, Vol. 37(4), pp. 1065-1082, **2015.**
9. Sunkulp Goel, R. Jayaganthan, **I.V. Singh**, D. Srivastava, G.K. Dey, N. Saibaba, Texture Evolution and Ultrafine Grain Formation in Cross-Cryo-Rolled Zircaloy-2, *Acta Metallurgica Sinica*, Vol. 28, pp. 837-846, **2015**.
10. G. Bhardwaj, **I.V. Singh**, B.K. Mishra, T.Q. Bui, Numerical Simulation of Functionally Graded Cracked Plates using NURBS based XIGA under Different Load and Boundary Conditions, *Composite Structures*, Vol. 126, pp. 347–359, **2015**.
11. Sunkulp Goel, Nachiket Keskar, R. Jayaganthan, **I.V. Singh**, D. Srivastava, G.K. Dey, S.K. Jha, N. Saibaba, Texture and Mechanical Behavior of Zircaloy-2 Rolled at Different Temperatures, *Journal of Materials Engineering and Performance*, Vol. 24, 618–625, **2015**.
12. Sunkulp Goel, Nachiket Keskar, R. Jayaganthan, **I.V. Singh**, D. Srivastava, G.K. Dey, N. Saibaba, Development of Ultrafine Grained Zircaloy-2 by Room Temperature Cross Rolling, *Journal of Materials Engineering and Performance,* Vol. 24, 609–617, **2015**.
13. S. Kumar, **I.V. Singh,** B.K. Mishra, A Homogenized XFEM Approach to Simulate Fatigue Crack Growth Problems, *Computers & Structures,* Vol. 150, pp. 1–22, **2015**.
14. G. Bhardwaj, **I.V. Singh,** B.K. Mishra, Stochastic Fatigue Crack Growth Simulation of Interfacial Crack in Bi-layered FGMs using XIGA, *Computer Methods in Applied Mechanics and Engineering*, Vol. 284, pp. 186–229, **2015**.
15. S. Kumar, **I.V. Singh,** B.K. Mishra, Timon Rabczuk, Modeling and Simulation of Kinked Cracks by Virtual Node XFEM, *Computer Methods in Applied Mechanics and Engineering*, Vol. 283, pp. 1425–1466, **2015**.
16. **I.V. Singh**, G. Bhardwaj, B.K. Mishra, A New Criterion for Modeling Multiple Discontinuities Passing through an Element using XIGA, *Journal of Mechanical Science and Technology*, Vol. 29(3), pp. 1141–1143, **2015**.
17. Sunkulp Goel, Gaurav Kumar, R. Jayaganthan, **I.V. Singh**, D. Srivastava, G.K. Dey, N. Saibaba, Experimental Evaluation of Mechanical Properties and Fracture-Fatigue Simulation of Cryo and Room Temperature Rolled Zircaloy-2, *International Journal of Microstructure and Materials Properties*, Vol. 9(2), pp. 120–135, **2014**.
18. S. Kumar, **I.V. Singh,** B.K. Mishra, A Multigrid Coupled (FE-EFG) Approach to Simulate Fatigue Crack Growth in Heterogeneous Materials, *Theoretical and Applied Fracture Mechanics*, Vol. 72, pp. 121–135, **2014**.
19. Kamal Sharma, **I.V. Singh**, B.K. Mishra, S.K. Maurya, Numerical Simulation of Semi-Elliptical Axial Crack in Pipe Bend using XFEM, *Journal of Solid Mechanics*, Vol. 6(2), pp. 208–228, **2014**.
20. S. Kumar, **I.V. Singh,** B.K. Mishra, A Coupled Finite Element and Element-Free Galerkin Approach for the Simulation of Stable Crack Growth in Ductile Materials, *Theoretical and Applied Fracture Mechanics*, Vol. 70, pp. 49–58, **2014.**
21. H. Pathak, A. Singh, **I.V. Singh**, Fatigue Crack Growth Simulations of Homogeneous and Bi-material Interfacial Cracks using Element Free Galerkin Method, *Applied Mathematical Modeling*, Vol. 38, pp. 3093–3123, **2014.**

22. S. Kumar, **I.V. Singh,** B.K. Mishra, XFEM Simulation of Stable Crack Growth using *J-R* and CTOA Criteria, *International Journal of Mechanics and Materials in Design*, Vol. 10, pp. 165–177, **2014**.

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