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■ RESEARCH INTERESTS

Computational mechanics, Finite element methods, Meshfree methods, Computational failure analysis, Computational multiscale/multiphysics analysis, Structural system analysis, Integrated computational materials engineering, Computational model reduction.

■ EDUCATION

Ph.D. (08/2004-06/2008): Theoretical and Applied Mechanics, Northwestern University, Evanston, Illinois

- Advisor: Dr. Ted Belytschko
- Ph.D. thesis: Computations of the dynamic fracture of quasi-brittle plane and shell structures by the extended finite element method

M.S. (03/2001-02/2003): Department of Civil Engineering, Yonsei University, Seoul, Korea

- Advisor: Dr. Sang-Ho Lee
- M.S. thesis: Crack propagation analysis of steel structures by using the extended finite element method

B.S. (03/1997-02/2001): School of Civil and Urban Engineering, Yonsei University, Seoul, Korea

■ CURRENT APPOINTMENTS

Assistant Professor: Civil, Environmental and Architectural Engineering
(08/2014-Present) College of Engineering and Applied Science, University of Colorado, Boulder, Colorado

Faculty: Materials Science and Engineering Program
(11/2014-Present) College of Engineering and Applied Science, University of Colorado, Boulder, Colorado

■ PREVIOUS APPOINTMENTS

ONR Research Faculty Fellow: Computational Multiphysics Systems Lab., Naval Research Lab., Washington DC (2014-2016) (*Typical summer 10 weeks residency at NRL in each year*)

Assistant Professor: Civil and Environmental Engineering, College of Engineering and Computing, University of South Carolina, Columbia, South Carolina (01/2011-08/2014)

Faculty: Interdisciplinary Mathematics Institute, College of Arts and Science, University of South Carolina, Columbia, South Carolina (01/2011-08/2014)

Post-doctoral Fellow: Department of Mechanical Engineering, Northwestern University, Evanston, Illinois (06/2008-12/2010) (Advisor: Dr. Ted Belytschko)

Graduate Research Assistant: Theoretical and Applied Mechanics, Northwestern University, Evanston, Illinois (08/2004-06/2008)

Associate Researcher: Disaster Prevention Research Center, Yonsei University, Seoul, Korea (03/2003-07/2004)

Pre-doctoral Fellow: Theoretical and Applied Mechanics, Northwestern University, Evanston, Illinois (03/2003-02/2004) (Advisor: Dr. Ted Belytschko)

■ AWARDS & HONORS

ONR Summer Faculty Research Fellowship (2014, 2015, 2016): the U.S. Office of Naval Research

Research Assistant Fellowship (08/2004-06/2008): Northwestern University, Evanston, Illinois

Graduate Student Fellowship (2006, 2008): 7th and 8th World Congress on Computational Mechanics

Graduate Student Fellowship (2005, 2007): 8th and 9th U.S. National Congress on Computational Mechanics

Graduate School Scholarship (2002): honor prize for high scholarship, Yonsei University, Korea

Undergraduate School Honor Prize (1998): honor prize for high scholarship, Yonsei University, Korea

■ PEER-REVIEWED JOURNAL PUBLICATIONS

• According to google scholar [[Link](#)], h -index = 20 and the total number of citations = 2,598 [1,5621 citations since 2014 and annual citations for the past five years are: 397 (in 2018), 284 (2017), 327 (2016), 289 (2015), 268 (2014)].

(* denotes Corresponding Author, ___ denotes Graduate student or Post-doctoral Fellow)

1. Y.C. Yoon*, P. Schaefferkoetter, T. Rabczuk and **J.H. Song***, New strong formulation for material nonlinear problems based on the particle difference method, *Engineering Analysis with Boundary Elements*, **98**: 310–327 (2019). (**Special Issue on Boundary element method for nonlinear problems**)
2. **I. Asareh**, T.Y. Kim* and **J.H. Song***, A linear complete extended finite element method for dynamic fracture simulation with non-nodal enrichments, *Finite Elements in Analysis and Design*, **152**: 27-45 (2018)
3. **I. Asareh**, Y.C. Yoon and **J.H. Song***, A numerical method for dynamic fracture using the extended finite element method with non-nodal enrichment parameters, *International Journal of Impact Engineering*, **121**: 63-76 (2018).
4. **K.C. Hoang**, T.Y. Kim and **J.H. Song***, Fast and accurate two-field reduced basis approximation for parametrized thermoelasticity problems, *Finite Element Analysis and Design*, **141**: 96-118 (2018).
5. **J.H. Song***, **Y. Fu**, T.Y. Kim, Y.C. Yoon, J.G. Michopoulos and T. Rabczuk, Phase field simulations of coupled microstructure solidification problems via the strong form particle difference method, *International Journal of Mechanics and Materials in Design*, **14**: 491-509 (2018).
6. **Y. Fu***, J.G. Michopoulos and **J.H. Song***, On investigating the thermomechanical properties of cross-linked epoxy via molecular dynamics analysis, *Nanoscale and Microscale Thermophysical Engineering*, **21**:8-25 (2017).
7. **Y. Fu**, J.G. Michopoulos and **J.H. Song***, Bridging the multi-phase field model with the molecular dynamics for the solidification of nano-crystals, *Journal of Computational Science*, **20**:187-197 (2017).
8. **K.C. Hoang**, **Y. Fu**, and **J.H. Song***, An hp -proper orthogonal decomposition-moving least squares approach for molecular dynamics simulation, *Computer Methods in Applied Mechanics and Engineering*, **298**: 548–575 (2016).
9. J. Lua*, T. Zhang, E. Fang and **J.H. Song***, Explicit Phantom Paired Shell Element Approach for Crack Branching and Impact Damage Prediction of Aluminum Structures, *International Journal of Impact Engineering*, **87**: 28–43 (2016). (**Special Issue on Experimental Testing and Computational Modeling of Dynamic Fracture**)
10. **Y. Fu***, J.G. Michopoulos and **J.H. Song***, Dynamic response of glassy polyethylene polymer nanocomposites to shock wave loading, *Journal of Polymer Science Part B: Polymer Physics*, **53**: 1292-1302 (2015).
11. **Y. Fu***, J.G. Michopoulos, and **J.H. Song***, Coarse-grained molecular dynamics simulations of epoxy resin during the curing process, *Computational Materials Science*, **107**: 24-32 (2015).
12. **Y. Fu*** and **J.H. Song***, Heat flux expressions that satisfy the conservation laws in atomistic system involving multibody potentials, *Journal of Computational Physics*, **294**: 191–207 (2015).
13. **Y. Fu** and **J.H. Song***, Large deformation mechanism of glassy polyethylene polymer nanocomposites: coarse grain molecular dynamics study, *Computational Materials Science*, **96**: 485-494 (2015). (**Special Issue on Polymeric Composites**)
14. A. Tabarraia*, S. Shadaloua and **J.H. Song**, Mechanical properties of Graphene nanoribbons with disordered edges, *Computational Materials Science*, **96**: 10-19 (2015).
15. A. Tabarraie*, X. Wang, A. Sadeghirad and **J.H. Song**, An enhanced bridging domain method for linking atomistic and continuum domains, *Finite Elements in Analysis and Design*, **92**:36-49 (2014).
16. **Y. Fu*** and **J.H. Song***, On computing stress in polymer systems involving multi-body potentials from molecular dynamics simulation, *Journal of Chemical Physics*, **141**: 054108 (2014).
17. **J.H. Song*** and Y.C. Yoon, Multiscale failure analysis with coarse-grained micro cracks and damage, *Theoretical and Applied Fracture Mechanics*, **72**: 100-109 (2014).
18. Y.C. Yoon and **J.H. Song***, Extended particle difference method for moving boundary problems, *Computational Mechanics*, **54**:723–743 (2014).
19. Y.C. Yoon* and **J.H. Song**, Extended particle difference method for weak and strong discontinuity problems: Part II. Formulations and applications for various interfacial singularity problems, *Computational Mechanics*, **53**:1105-1128 (2014).
20. Y.C. Yoon and **J.H. Song***, Extended particle difference method for weak and strong discontinuity problems: Part I. Derivation of the extended particle derivative approximation for the representation of weak and strong discontinuities, *Computational Mechanics*, **53**:1087-1103 (2014).

21. A. Tabarraei, **J.H. Song*** and H. Waisman, Two-scale approach for modeling adiabatic shear band propagation under impact loads, *International Journal for Multiscale Computational Engineering*, **11**: 543-563 (2013). *(Special issue on Multiscale Methods in Fracture Mechanics with Extended/Generalized Finite Elements)*
22. **J.H. Song***, P. Lea and J. Oswald, Explicit dynamic finite element method for predicting implosion/explosion induced failure of shell structures, *Mathematical Problems in Engineering*, **2013**: 957286 (2013). *(Special issue on Computational Methods for Fracture)*
23. **J.H. Song***, T. Menouillard and A. Tabarraei, Explicit dynamic finite element method for failure with smooth fracture energy dissipations, *Mathematical Problems in Engineering*, **2013**: 293861 (2013). *(Special issue on Computational Methods for Fracture)*
24. H. Nguyen-Vinh, I. Bakar, M.A. Msekh, **J.H. Song**, J. Muthu, G. Zi, P. Le, S. Bordas, R. Simpson, S. Natararajan, T. Lahmer and T. Rabczuk*, Extended finite element method for dynamic fracture of piezo electric materials, *Engineering Fracture Mechanics*, **92**:19-31 (2012).
25. O. Barkai, T. Menouillard, **J.H. Song**, T. Belytschko and D. Sherman*, Crack initiation and path selection in brittle specimens: a novel experimental method and computations, *Engineering Fracture Mechanics*, **89**:65-74 (2012).
26. T. Chau-Dinh, G. Zi*, P.S. Lee, T. Rabczuk, and **J.H. Song**, Phantom-node method for shell models with arbitrary cracks, *Computer & Structure*, **92-93**: 242-256 (2012).
27. T. Belytschko* and **J.H. Song**, Coarse-graining of multiscale crack propagation, *International Journal for Numerical Methods in Engineering*, **81**:537-563 (2010).
28. T. Rabczuk, R. Gracie, **J.H. Song** and T. Belytschko*, Immersed particle method for fluid-structure interaction, *International Journal for Numerical Methods in Engineering*, **81**:48-71 (2010). *(Selected for the most cited article of the journal in 2012)*
29. T. Menouillard, **J.H. Song**, Q. Duan and T. Belytschko*, Time dependent crack tip enrichment for dynamic crack propagation, *International Journal of Fracture*, **162**: 33-49 (2010).
30. Q. Duan, **J.H. Song**, T. Menouillard and T. Belytschko*, Element-local level set method for three-dimensional dynamic crack growth, *International Journal for Numerical Methods in Engineering*, **80**:1520-1543 (2009).
31. **J.H. Song*** and T. Belytschko, Multiscale aggregating discontinuities method for micro-macro failure of composites, *Composite Part B: Engineering*, **40**:417-426 (2009). *(Special issue on Blast/Impact on Engineered Nano Composite Materials)*
32. **J.H. Song*** and T. Belytschko, Dynamic fracture of shells subjected to impulsive loads, *Journal of Applied Mechanics –Transactions of the ASME*, **76**:051301 (2009).
33. T. Rabczuk, **J.H. Song*** and T. Belytschko, Simulations of instability in dynamic fracture by the cracking particles method, *Engineering Fracture Mechanics*, **76**:730-741 (2009). *(Special issue on Multi-scale analysis of evolving interfaces in (multi) materials - Multi-scale Analysis)*
34. **J.H. Song** and T. Belytschko*, Cracking node method for dynamic fracture with finite elements, *International Journal for Numerical Methods in Engineering*, **77**:360-385 (2009).
35. **J.H. Song***, H.W. Wang and T. Belytschko*, A comparative study on finite element methods for dynamic fracture, *Computational Mechanics*, **42**:239-250 (2008). *(Special issue on Challenges in Computational Mechanics)*
36. T. Belytschko*, S. Loehnert and **J.H. Song**, Multiscale aggregating discontinuities: A method for circumventing loss of material stability, *International Journal for Numerical Methods in Engineering*, **73**: 869-894 (2008). *(Included in virtual issue honors the work of Ted Belytschko, IJNME Editor Emeritus, in 2014)*
37. **J.H. Song**, P.M.A. Areias and T. Belytschko*, A method for dynamic crack and shear band propagation with phantom nodes, *International Journal for Numerical Methods in Engineering*, **67**: 868-893 (2006).
38. P.M.A. Areias, **J.H. Song** and T. Belytschko*, Analysis of fracture in thin shells by overlapping paired elements, *Computer Methods in Applied Mechanics and Engineering*, **195**: 5343-5360 (2006).
39. P.M.A. Areias, **J.H. Song** and T. Belytschko*, A finite-strain quadrilateral shell element based on discrete Kirchhoff-Love constraints, *International Journal for Numerical Methods in Engineering*, **64**: 1166-1206 (2005).
40. G. Zi*, **J.H. Song** and S.H. Lee, A new method for growing multiple cracks without remeshing and its application to fatigue crack growth, *KSCE Journal of the Korean Society of Civil Engineers*, **25**:183-190 (2005).
41. G. Zi*, **J.H. Song**, E. Budyn, S.H. Lee and T. Belytschko, A method for growing multiple cracks without remeshing and its application to fatigue crack growth, *Modeling and Simulations in Materials Science and Engineering*, **12**: 901-915 (2004). *(Selected for the most downloaded article of the year in 2004 and included in publications of Institute of Physics Journal)*
42. S.H. Lee*, **J.H. Song**, Y.C. Yoon, G. Zi and T. Belytschko, Combined extended and superimposed finite element method for crack, *International Journal for Numerical Methods in Engineering*, **59**:1119-1136 (2004).

43. S.H. Lee*, **J.H. Song** and M.Y. Kim, Crack propagation analysis without mesh-dependency by using extended finite element method, *KSCE Journal of the Korean Society of Civil Engineers*, **23**: 1077-1086 (2003).

■ PEER-REVIEWED CONFERENCE PROCEEDINGS

(___ denotes Graduate student or Post-doctoral Fellow)

1. T.Y. Kim, W. Jiang, S.M. Lee, **J.H. Song** and E.J. Park, Vesicle shape deformation using a discontinuous Galerkin method, *6th European Conference on Computational Mechanics (ECCM 6) and 7th European Conference on Computational Fluid Dynamics (ECFD 7)*, MS135F, 1-10 (2018).
2. J.G. Michopoulos, A. Iliopoulos, J. Steuben, A. J. Birnbaum, Y. Fu and **J.H. Song**, Towards computational synthesis of microstructural crystalline morphologies for additive manufacturing applications, *Proceedings of ASME 2017 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference. American Society of Mechanical Engineers*, V001T02A030 (2017).
3. S.H. Lee, **J.H. Song** and H.M. Seok, Combined extended and superimposed finite element method for crack analysis, *Proceedings of Computational Structural Engineering Institute of Korea*, **17**(1): 341-348 (2004).
4. S.H. Lee and **J.H. Song**, Development of crack analysis technique by using extended finite element method free from mesh-dependency, *Proceedings of Computational Structural Engineering Institute of Korea*, **15**(2): 112- 119 (2002).
5. S.H. Lee, **J.H. Song** and K.H. Leem, Modified stiffness matrix of reflecting the effect of local cracks, *Proceedings of Computational Structural Engineering Institute of Korea*, **15**(1): 353-360 (2002).
6. S.H. Lee, **J.H. Song** and Y.S. Jeong, Development of a finite element analysis data model for steel box girder bridges based on STEP part 104, *Proceedings of Computational Structural Engineering Institute of Korea*, **14**(2): 193-200 (2001).

■ CHAPTERS IN BOOK

1. **J.H. Song** and T. Menouillard, *Explicit dynamic finite element method for fracture of Shells*, Computational Mechanics Research Trends: Computer Science, Technology and Applications, H. P. Berger (Eds.), Nova Science Publisher, pp. 291-317 (2009).
2. T. Belytschko, **J.H. Song**, H.W. Wang and R. Gracie, *On applications of XFEM to dynamic fracture and dislocations*, IUTAM Symposium on Discretization Methods for Evolving Discontinuities: Proceedings of the IUTAM Symposium held in Lyon, France, 4-7 September 2006, A. Combescure, R. de Borst and T. Belytschko (Eds.), Springer, pp. 155-170 (2007).

■ PEER-REVIEWED CONFERENCE PRESENTATIONS

(___ denotes Graduate student or Post-doctoral Fellow)

1. **J.H. Song**, A. Almasi, A. Beel and P. Schaefferkoetter, Strong form meshfree collocation method for nonlinear problems in solid mechanics, *ASCE Engineering Mechanics Institute Conference 2019*, Pasadena, California, 2019.
2. A. Almasi, T.Y. Kim and **J.H. Song**, Strong Form Meshfree Collocation Method for Signorini Frictional Contact Problems, *ASCE Engineering Mechanics Institute Conference 2019*, Pasadena, California, 2019.
3. T.Y. Kim, W. Jiang and **J.H. Song**, Nitsche's method for the shape deformation of a single component vesicle, *ASCE Engineering Mechanics Institute Conference 2019*, Pasadena, California, 2019.
4. T.Y. Kim, W. Jiang, S.M. Lee and **J.H. Song**, Vesicle shape deformation using a discontinuous Galerkin method, *6th European Conference on Computational Mechanics/7th European Conference on Computational Fluid Dynamics*, Glasgow, UK, 2018.
5. A. Almasi and **J.H. Song**, The strong form collocation method for the prediction of polycrystalline solidification with the diffuse-interface approach, *13th World Congress on Computational Mechanics and 2nd Pan American Congress on Computational Mechanics*, New York, NY, 2018.
6. A. Beel, T. Y. Kim and **J.H. Song**, Solving the linearized stationary quasi-geostrophic equations of the ocean using the particle difference method, *13th World Congress on Computational Mechanics and 2nd Pan American Congress on Computational Mechanics*, New York, NY, 2018.
7. **J.H. Song**, A. Almasi, T.Y. Kim and Y.C. Yoon, Application of the particle difference method (PDM) for predicting solidification of polycrystalline via diffusive interface approach, *14th US National Congress on Computational Mechanics*, Montreal, Canada, 2017.
8. A. Beel, A. Iliopoulos, J. Michopoulos and **J.H. Song**, Strain field approximation and crack tracking using the particle difference approximation, *14th US National Congress on Computational Mechanics*, Montreal, Canada, 2017.

9. Y.C. Yoon and **J.H. Song**, New particle difference algorithm for material nonlinear problem, *14th US National Congress on Computational Mechanics*, Montreal, Canada, 2017.
10. T. Laursen, T.Y. Kim, **D.K. Jadaan**, **J.H. Song**, Frictional contact on a rigid obstacle for the particle difference method, *14th US National Congress on Computational Mechanics*, Canada, 2017.
11. J.G. Michopoulos, A. Iliopoulos, J. Steuben, A. J. Birnbaum, **Y. Fu** and **J.H. Song**, Towards computational synthesis of microstructural crystalline morphologies for additive manufacturing applications, *ASME 2017 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference*, Cleveland, Ohio, 2017.
12. **Y. Fu**, J.G. Michopoulos and **J.H. Song**, “Coarse-grained molecular dynamics simulations of epoxy resin during the curing process”, *13th US National Congress on Computational Mechanics*, San Diego, California, 2015.
13. **K.C. Hoang**, P. Kerfriden, S.P.A. Bordas and **J.H. Song**, Reduced basis approximation for 2D elasticity problems with geometry representing by parametric curves, *ASCE Engineering Mechanics Institute Conference 2015*, Stanford, California, 2015.
14. **Y. Fu** and **J.H. Song**, Stress and heat flux in polymer nano-composite system involving multi-body potentials, *17th U.S. National Congress on Theoretical and Applied Mechanics*, East Lansing, Michigan, 2014.
15. E. Biyikli, **I. Asareh**, **J.H. Song** and A. To, Adaptive schemes for multiresolution molecular mechanics, *17th U.S. National Congress on Theoretical and Applied Mechanics*, East Lansing, Michigan, 2014.
16. **I. Asareh** and **J.H. Song**, Multiscale extended finite element method for strain localization, *12th U.S. National Congress on Computational Mechanics*, Raleigh, North Carolina, 2013.
17. **J.H. Song**, Computational failure analysis for extreme dynamic loading conditions: localized vs. distributed failure, *Advances in Computational Mechanics*, San Diego, California, 2013.
18. **J.H. Song**, Dynamic fracture of plates and shells subjected to impulsive loads, *22th International Workshop on Computational Mechanics of Materials*, Baltimore, Maryland, 2012.
19. P. Lea, **J.H. Song** and Ted Belytschko, Extension of XFEM cracks in thin shell elements to include slanted cracks, *10th World Congress on Computational Mechanics and 4th Asian Pacific Congress on Computational Mechanics*, Sao Paulo, Brazil, 2012.
20. **J.H. Song** and T. Belytschko, Multiscale analysis for failure, *11th U.S. National Congress on Computational Mechanics*, Minneapolis, Minnesota, 2011.
21. P. Lea, S. Peng, **J.H. Song** and T. Belytschko, Dynamic crack propagation using an hd-adaptive XFEM approach, *11th U.S. National Congress on Computational Mechanics*, Minneapolis, Minnesota, 2011.
22. S. Peng, P. Lea, **J.H. Song** and T. Belytschko, “Dynamic failure analysis of thin shell structures and its practical implementation strategy”, *11th U.S. National Congress on Computational Mechanics*, Minneapolis, Minnesota, 2011.
23. P. Lea, S. Peng, **J.H. Song** and T. Belytschko, Dynamic crack propagation in shell elements using the extended finite element method, *ASME Applied Mechanics and Materials Division Conference*, Chicago, Illinois, 2011.
24. T. Rabczuk, R. Gracie, **J.H. Song** and T. Belytschko, Immersed meshfree method for fluid-structure interaction, *9th World Congress on Computational Mechanics and 4th Asian Pacific Congress on Computational Mechanics*, Sydney, Australia, 2010.
25. T. Menouillard, T. Belytschko and **J.H. Song**, Smoothly discontinuous enrichment in XFEM for dynamic crack propagation, *4th European Conference on Computational Mechanics*, Paris, France, 2010.
26. **J.H. Song**, T. Belytschko and Liang Xue, Recent developments on computational failure analysis with the extended finite element method, *2009 ASME International Mechanical Engineering Congress and Exposition*, Lake Buena Vista, Florida, 2009.
27. T. Belytschko and **J.H. Song**, *Keynote presentation: Multiscale aggregating discontinuities method for failure*, *2009 ASME International Mechanical Engineering Congress and Exposition*, Lake Buena Vista, Florida, 2009.
28. L. Xue, **J.H. Song** and T. Belytschko, Dynamic crack initiation and propagation for structural impact problems, *2009 ASME International Mechanical Engineering Congress and Exposition*, Lake Buena Vista, Florida, 2009.
29. C. Farhat, A. Rallu, **J.H. Song**, S. Kyriakides and T. Belytschko, Fluid-structure interaction computations of the dynamic collapse of cylindrical shells, *2009 ASME International Mechanical Engineering Congress and Exposition*, Lake Buena Vista, Florida, 2009.
30. **J.H. Song** and T. Belytschko Multiscale aggregating discontinuities method: coarse graining of micro macro multiscale failure, *10th U.S. National Congress on Computational Mechanics*, Columbus, Ohio, 2009.
31. **J.H. Song**, S.I. Park, H.J. Kim and S.H. Lee, Advances in the extended finite element method for dynamic fracture: continuous crack model and discrete crack model, *10th U.S. National Congress on Computational Mechanics*, Columbus, Ohio, 2009.
32. T. Menouillard, **J.H. Song** and T. Belytschko, Improved crack tip enrichment in the extended finite element method for explicit dynamics, *10th U.S. National Congress on Computational Mechanics*, Columbus, Ohio, 2009.

33. Q. Duan, **J.H. Song** and T. Belytschko, Element-local level set method for 3D dynamic crack growth, *10th U.S. National Congress on Computational Mechanics*, Columbus, Ohio, 2009.
34. T. Belytschko and **J.H. Song**, Multiscale methods for failure: part I. theory, *2008 ASME International Mechanical Engineering Congress and Exposition*, Boston, Massachusetts, 2008.
35. **J.H. Song** and T. Belytschko, Multiscale methods for failure: part II. applications, *2008 ASME International Mechanical Engineering Congress and Exposition*, Boston, Massachusetts, 2008.
36. **J.H. Song**, S. Loehnert and T. Belytschko, Multiscale equivalent aggregating discontinuities: circumventing loss of ellipticity, *8th World Congress on Computational Mechanics*, Venice, Italy, 2008.
37. **J.H. Song**, D.J. Kim, S.H. Lee and T. Belytschko, A comparative study on dynamic fracture with finite element methods, *8th World Congress on Computational Mechanics*, Venice, Italy, 2008.
38. T. Belytschko, **J.H. Song**, R. Gracie and J. Oswald, Advances in the extended finite element method (XFEM), *8th World Congress on Computational Mechanics*, Venice, Italy, 2008.
39. **J.H. Song**, S.I. Park, D.J. Kim and S.H. Lee, Explicit dynamic finite element method for fracture of shell structures, *4th International Conference on Advances in Structural Engineering and Mechanics*, Jeju, Korea, 2008.
40. T. Belytschko, **J.H. Song** and S. Loehnert, Multiscale methods for the failure of heterogeneous materials, *10th Pan American Congress of Applied Mechanics*, Cancun, Mexico, 2008.
41. T. Belytschko, **J.H. Song** and M. Xu, Multiscale methods for failure analysis: circumventing loss of quasi convexity, *9th International Conference on Computational Plasticity*, Barcelona, Spain, 2007.
42. **J.H. Song** and T. Belytschko, Brittle/ductile dynamic fracture in 2D plane and shell elements with XFEM, *9th U.S. National Congress on Computational Mechanics*, San Francisco, California, 2007.
43. T. Belytschko, R. Gracie, S. Loehnert, J. Oswald and **J.H. Song**, Meshfree and PU multiscale methods for failure: on circumventing loss of ellipticity, dislocations and other issues, *9th U.S. National Congress on Computational Mechanics*, San Francisco, California, 2007.
44. **J.H. Song** and T. Belytschko, Dynamic crack propagation in thin shells with the phantom node method, *7th World Congress on Computational Mechanics*, Los Angeles, California, 2006.
45. T. Belytschko, **J.H. Song** and H.W. Wang, On methods for static and dynamic failure propagation, *7th World Congress on Computational Mechanics*, Los Angeles, California, 2006.
46. **J.H. Song**, P.M.A. Areias and T. Belytschko, A dynamic crack propagation simulation technique with phantom nodes, *8th U.S. National Congress on Computational Mechanics*, Austin, Texas, 2005.
47. P.M.A. Areias, **J.H. Song** and T. Belytschko, Ductile fracture in shell structure using a piecewise enrichment, *8th U.S. National Congress on Computational Mechanics*, Austin, Texas, 2005.
48. S.H. Lee, **J.H. Song**, Y.C. Yoon, G. Zi and T. Belytschko, Combined extended and superimposed finite element method for modeling of cracks, *6th World Congress on Computational Mechanics*, Beijing, China, 2004.
49. S.H. Lee, **J.H. Song** and H.M. Seok, Combined extended and superimposed finite element method for crack analysis, *Computational Structural Engineering Institute of Korea*, Korea, 2004.
50. S.H. Lee and **J.H. Song**, Development of crack analysis technique by using extended finite element method free from mesh-dependency, *Computational Structural Engineering Institute of Korea*, Korea, 2002.
51. S.H. Lee, **J.H. Song** and K.H. Leem, Modified stiffness matrix of reflecting the effect of local cracks, *Computational Structural Engineering Institute of Korea*, Korea, 2002.
52. S.H. Lee, **J.H. Song** and Y.S. Jeong, Development of a finite element analysis data model for steel box girder bridges based on STEP part 104, *Computational Structural Engineering Institute of Korea*, Korea, 2001.

■ INVITED SEMINARS & KEYNOTE LECTURES

1. **J.H. Song**, Predicting Microstructure Evolutions in Metal under Selective Laser Sintering/Melting Process for 3D Printing: Particle difference method (PDM) for solving the strong form of higher order PDEs, *Idaho National Lab.*, Idaho Falls, ID, 2016.
2. **J.H. Song**, Predicting recrystallization process in metal additive manufacturing with the point collocation method, *Center of Computational Material Science, Naval Research Lab.*, Washington DC, 2016.
3. **J.H. Song**, Predicting microstructure evolutions in metal under selective laser sintering/melting process for 3d printing, *the Physically-Based Modeling of Polyatomic Gases and Phase Transitions (PBM 2016)*, the Okinawa Institute of Science and Technology Graduate University, Okinawa, Japan, 2016.
4. **J.H. Song**, Point collocation method for MD-Phase field model, *Center of Computational Material Science, Naval Research Lab.*, Washington DC, 2015.
5. **J.H. Song**, Computational failure analysis for beyond design-basis events: from single scale structural failure analysis to multiscale material design, *Department of Civil and Environmental Engineering, Pennsylvania State University*, University Park, Pennsylvania, 2014.

6. **J.H. Song**, Computational failure analysis for beyond design-basis events: from single scale structural failure analysis to multiscale material design, *Department of Civil, Environmental and Architectural Engineering, University of Colorado*, Boulder, Colorado 2014.
7. **J.H. Song**, Computational failure analysis for localized and distributed failure, *Workshop on Computational Methods for Problems with Evolving Domains and Discontinuities, the Army High Performance Computing Research Center (AHPARC), Stanford University*, California, 2013.
8. **J.H. Song**, Multiscale modeling for failure with extended finite element method: problem identifications & multiscale modeling strategies, *Marie Curie initial training network (ITN)-integrating numerical simulation and geometric design technology (INSIST) summer school, Institute for Structure Mechanics, Bauhaus University Weimar*, Weimar, Germany, 2013.
9. **J.H. Song**, Multiscale extended finite element methods for ductile failure, *Center of Computational Material Science, Naval Research Lab.*, Washington, DC, 2013.
10. **J.H. Song**, Computational failure analysis for beyond design-basis events: from single-physics to multi-physics structural failure problems, *Department of Civil and Environmental Engineering, Rensselaer Polytechnic Institute*, Troy, New York, 2012.
11. **J.H. Song**, Computational failure analysis: from single-physics to multi-physics structural failure problems, *Department of Civil, Environmental and Geodetic Engineering, Ohio State University*, Columbus, Ohio, 2012.
12. **J.H. Song**, Recent developments in computational failure analysis: from single-scale to multi-scale failure, *Center for Mechanics of Solids, Structures and Materials, University of Texas at Austin*, Austin, Texas, 2012.
13. **J.H. Song**, Extended finite element method for failure analysis, *European Community on Computational Methods in Applied Sciences - thematic conferences: XFEM 2011, Cardiff University*, Wales, United Kingdom, 2011.
14. **J.H. Song**, Recent developments in computational failure analysis: from single-scale to multi-scale analysis, *Weidlinger Associates, Inc.*, New York, New York, 2011
15. **J.H. Song**, Computational failure analysis and its parallelization strategy, *High Performance Computing Workshop, University of South Carolina*, Columbia, South Carolina, 2011.
16. **J.H. Song**, Recent developments in computational failure analysis: from single-scale to multi-scale analysis, *Applied and Computational Mathematics seminar, Department of Mathematics, University of South Carolina*, Columbia, South Carolina, 2011
17. **J.H. Song**, Recent developments in computational failure analysis: from single-scale to multi-scale analysis, *Department of Civil and Environmental Engineering, University of South Carolina*, Columbia, South Carolina, 2010.
18. **J.H. Song**, Recent developments in computational failure analysis: from single-scale to multi-scale analysis, *Department of Civil and Environmental Engineering, University of Washington*, Seattle, Washington, 2010.
19. **J.H. Song**, Recent developments in computational failure analysis with the extended finite element method, *School of Civil, Environmental and Architectural Engineering, Korea University*, Seoul, Korea, 2009.

■ PROFESSIONAL SERVICE ACTIVITIES

JOURNAL EDITORIAL

- **Editorial Board Member**
Computers, Materials & Continua, Tech Science Press (SCI journal) 2018-Present
- **Journal Guest Editor**
Special issue on “Computational modeling of material deterioration at various length scales,” *International Journal of Fracture*, Vol. 203, 2017. 2016-2017
- **Journal Co-guest Editor**
Special issue on “Experimental testing and computational modeling of dynamic fracture,” *International Journal of Impact Engineering*, Vol. 87, 2016. 2015-2016

ORGANIZING ACADEMIC CONFERENCE

- **Conference Scientific Committee**
 1. 9th International Conference on Fracture of Concrete and Concrete Structures (FraMCoS-9), Berkeley, California, 2016
- **Conference Mini-symposium Organizer**
 1. Advanced computational methods and theories for predicting material behaviors at various length scales, *13th World Congress in Computational Mechanics*, New York, New York, 2018.
 2. Advanced computational methods and theories for predicting material behaviors at various length scales, *14th US National Congress on Computational Mechanics*, Montreal, Canada, 2017.

3. Advances in computational failure modeling of advanced cement-based material and reinforced concrete in various length scales, *9th International Conference on Fracture of Concrete and Concrete Structures*, Berkeley, California, 2016.
 4. Advanced computational method and theory for predicting material behaviors in various length scales, *13th US National Congress on Computational Mechanics*, San Diego, California, 2015.
 5. Recent developments in computational methods for real-time computing for hybrid simulation, *ASCE Engineering Mechanics Institute Conference 2015*, Stanford, California, 2015.
 6. Recent developments in computational failure analysis: from single scale to multiscale failure analysis, *11th US National Congress on Computational Mechanics*, Minneapolis, Minnesota, 2011.
- **Conference Mini-symposium Co-organizer**
 1. Advanced computational methods and theories for multi-scale and multi-physics problems in solids and fluids, *20th International Conference on Fluid Flow Problem*, Chicago, Illinois, 2019.
 2. Modeling and simulation in additive manufacturing, *14th US National Congress on Computational Mechanics*, Montreal, Canada, 2017.
 3. Modeling and simulation of 3D printing and additive manufacturing, *13th US National Congress on Computational Mechanics*, San Diego, California, 2015.
 4. Bridging atomistics and continuum: theory, method, and application, *17th US National Congress on Theoretical and Applied Mechanics*, East Lansing, Michigan, 2014.
 5. Computational methods for blast and impact in mechanics of materials, *12th US National Congress on Computational Mechanics*, Raleigh, North Carolina, 2013.
 6. Recent developments in computational failure analysis, *4th European Conference on Computational Mechanics: Solids, Structures and Coupled Problems in Engineering*, Paris, France, 2010.
 7. Advanced computational methods for fracture, *ASME International Mechanical Engineering Congress and Exposition*, Lake Buena Vista, Florida, 2009.

ACADEMIC COMMITTEE & SOCIETY AFFILIATIONS

- **Technical Committee**

Member, ASCE/EMI Computational Mechanics Committee	2013-Present
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- **Academic Society**

Member, American Society of Civil Engineers (ASCE)	2013-Present
Member, American Society of Mechanical Engineers (ASME)	2014-Present
Member, U.S. Association for Computational Mechanics (USACM)	2006-Present
Member, International Association for Computational Mechanics (IACM)	2006-Present

PEER-REVIEWING FOR JOURNALS (usually peer reviewing over 20 articles per year)

- **Computational Mechanics:** *International Journal for Numerical Methods in Engineering*, *Computer Methods in Applied Mechanics and Engineering*, *Computational Mechanics*, *Journal of Computational Physics*, *Finite Elements in Analysis and Design*, etc.
- **Solid Mechanics:** *International Journal of Solids and Structures*, *International Journal of Fracture*, *Engineering Fracture Mechanics*, *International Journal of Impact Engineering*, *Theoretical and Applied Fracture Mechanics*, etc.
- **Materials Science and Engineering:** *Computational Materials Science*, *International Journal of Mechanics and Materials in Design*, *International Journal of Mechanical Sciences*, *Polymer*, *Composites Part B – Engineering*, *Polymer Testing*, *Carbohydrate Polymers*, etc.
- **Civil Engineering:** *ASCE Computer-Aided Civil and Infrastructure Engineering*, *ASCE Journal of Computing in Civil Engineering*, *KSCE Journal of Civil Engineering*, etc.
- **Miscellaneous:** *Computers and Mathematics with Applications*, *Mathematical Problems in Engineering*, *Numerical Methods in Biomedical Engineering*, *Materials*, *Structural and Multidisciplinary Optimization*, etc.

PEER-REVIEWING FOR GRANT PROPOSALS

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|---|------|
| • DOE, 2019 Consolidated Innovative Nuclear Research Funding, Pre-proposal reviewer | 2018 |
| • NSF, Proposal review panel (P181503) | 2018 |
| • DOE, 2018 Consolidated Innovative Nuclear Research Funding, Proposal reviewer | 2018 |
| • DOE, 2017 Consolidated Innovative Nuclear Research Funding, Proposal reviewer | 2016 |
| • NSF, Proposal review panel (P170549) | 2016 |
| • U.S. Army Research Office, Proposal reviewer | 2011 |