Su Hao, Ph. D.

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SPECIAL SKILLS

-Steel structures' fracture and fatigue
-Large structures' analysis and 3D finite element computation
-Earthquake isolation structures and devices

EDUCATIONS

-Ph.D. in Engineering Mechanics, Zhejiang University, Hangzhou, Zhejia (http://www.zju.edu.cn/english)
-Postdoc, Tsinghua University (http://www.tsinghua.edu.cn/eng/index.jsp) Ranking 1 of Univ. in China, 5 in Asia.)
-Postdoc. Material Science, Institute of Material Research, GKSS (http://www.gkss.de) /Technique University of Hamburg/Harburg, Germany.

PROFESSIONAL EXPERIENCES

Research Engineer, Institute of Material Research, GKSS, Hamburg/Geesthacht, Germany	1991 – 1997
Senior Research Associate	
Dept. of Mechanical Engineering & Material Science, Northwestern Univ., Evanston, IL	1997 – 2006
Founder and Engineer, ACII, Inc., Wilmette, IL, U.S.A.	2005 – Present

AWARDS AND HONORS

Development Award: Fracture analysis of bi-materiel systems, *Development Association of GKSS, Hamburg, Germany*. (S. Hao)
Best Presentation Award: 3-D simulation of cracked mismatched welded joint and structural integrity analysis, *10th European conference on Fracture and structural integrity analysis, Berlin, Germany*. (S. Hao, A. Cornec, K.H. Schwalbe)
Best Presentation Award: Crack growth in mismatched welded joints, *the 2nd International Conference on Mismatched Welded Joints and Componsites, Reinstof, Germany*. (A. Cornec, S. Hao, K.H. Schwalbe)
Presentation Award of SAE: Dynamic Impact Analysis, *International Engineering Society for Advancing Mobility Land, Sea, Air, and Space*. (S. Hao)
Merit of Publication: A note of I35W Bridge Collapse(S. Hao), *Illinois Structural Engineers Association, US*

Author among the most cited publications in International Journal of Solids and Structures (with W.K. Liu, P. Klein, and A. Rosakis) o

PATENT PROVISIONAL to United State Patent and Tradmark Office (USPTO)

Smart Band-gap Composite (**US60/631,284**) for tunable materials
LMAR (**US61/202,842, US12/760,536**) lightweight armor, can also be used as bridge decks, blast-resistance well, etc.
VEB (US61/356,656; 61/358,043, 13,163,724) A class of Seismic Isolation Bearing
SFRP(US13/104,008), Structural-Fin Reinforced Penetrator

PROFESSIONAL MEMBERSHIPS

American Society of Mechanical Engineers (ASME), board member of Chicago Section (2007)	since 2000
American Society of Civil Engineers (ASCE)	since 2006
Structural Engineers Association of Illinois(SEAOI)	since 2008
U.S. Association for Iron and Steel Technology (AIST)	since 2005
U. S. National Association of Computational Mechanics (USNACM)	since 1997
Int. Congress on Computational Mechanics (ICCM)	since 1998

SUPPLEMENT: SELECTED PUBLICATIONS

[N1] S. Hao, Strom, Brandon, Gordon, Grant; Krishnaswamy, Sridhar; Achenbach, Jan, "Scattering of the Lowest Lamb Wave Modes by a Corrosion Pit", **Research in Nondestructive Detection**, v.22, Oct., 2011, pp.208-230.

[N2a] S. Hao, "I-35W Bridge Collapse", **J. Bridge Engineering,** Sept/Oct, Issue 5, 2010, pp.608-618.

[N2b] S. Hao, "I35W Bridge collapse: lessons learned and challenges revealed", **J Bridge Structures**, 7 (2011) 3–18

[N3] S. Hao, H. Lin, R Robert Binomiemic, D. M.G. Combsd and G. Fett, "A multi-scale model of intergranular fracture and computer simulation of fracture toughness of a carburized steel", **J. Computational Materials Science,** Volume 48, Issue 2, 2010, pp.241-249

[N4] S. Hao, Q. Wang, M. L. Keer, "A Mechanical Approach to Solve Two-Dimensional Static Electrical and Magnetic Fields: Applications to Contact between Conductors under Electrical Load" **J. Applied Mechanics, ASME Trans.,** Volume 77, May, 2010, 031013.

[N5] S. Hao, M. L. Keer, "Rolling Contact between Rigid Cylinder and Semi-infinite Elastic Body with Sliding and Adhesion", **J. Tribology, ASME Trans**. Volume 129, Pages 481-494, 2007

[N6] S. Hao, W. K. Liu. "Moving particle finite element with global super-convergence", **Computer Method in Applied Mechanics and Engineering**, Volume 196, Pages 6059-6072, 2006

[N7] S. Hao and J. Weertman, " Ductile Cr-Alloys with Solute and Precipitate Softening", book chapter in **Multiscaling in molecular and continuum mechanics: biology, electronics and material science**, edit. G.C.Sih, Springer, 2006

[N8] S. Hao, B. Moran, W.K. Liu, and G.B. Olson, *"A Hierarchical Multi-Physics Constitutive Model for Steels Design"*, **J. Computer-Aided Materials Design,** Volume 10, Number 2, Pages 99 – 142, 2003.

[N9] J.H. Fan, and S. Hao, *"A Design-Centered Approach in Developing Al-Si-Based Lightweight Alloys with Enhanced Fatigue Life and Strength"*, **J. Computer-Aided Materials Design**, a Volume 11, No. 2-3, Pages 139-161, 2004

[N10] S. Hao, W. Liu, and J. Weertman, *"Cohesive Solutions of Intersonic Crack Growth"*, **Philosophical Magazine A,** Volume 84, Number 11, Pages 1067-1104, 2004.

[N11] S. Hao, W. Liu, and T. Belytschko, *"Moving Particle Finite Element Method with Global Smoothness"*, **Int. J. Numer. Methods Engineering**, Volume 59, Page 1007-1020, 2004.

[N12] S. Hao, W.K. Liu, G.B. Olson, and B. Moran, *"Multi-Scale Constitutive Model and Computational Framework for the Design of Ultra-High Strength, High Toughness Steels"*, **Computer Method in Applied Mechanics and Engineering**, Volume 193/17-20, Pages 1865-1908, 2004.

[N13] S. Hao, W.K. Liu, P. Klein, and A. Rosakis*, "Modeling and Simulation of Intersonic Crack Growth"*, **Int. J. Solids Structures**, Volume 41, Number 7, Pages 1773-1799, 2003.

[N14] S. Hao, H. Park, and W. Liu, *"Moving Particle Finite Element"*, **Int. J. Num. Methods Engineering**, Volume 53, Number 8, 2001/2002.

[N15] S. Hao, W.K. Liu, and D. Quan, *"Localization-Induced Band and Cohesive Model"*, **J. Appl. Mech., Trans. ASME,** Volume 67, Number 4, 2000.

[N16] S. Hao, A. Cornec, and K. H. Schwalbe, *"The Effect of Yield Strength Mis-Match on the Fracture Analysis of Welded Joint"*, **Int. J. Solids Structure**, Volume 37, Number 39, Page 5385, 2000.

[N17] S. Hao, W.K. Liu, and C.T. Chang *"Computer Implementation of Damage Models by Finite Element and Meshfree Methods"*, **Computer Methods in Applied Mechanics and Engineering**, Volume 187, Number 3-4, Page 401, 2000.

[N18] W.K. Liu, S. Hao, T. Belytschko, S. Li, and C.T. Chang, *"Multi-Scale Methods"*, **Int. J. Num. Methods Engineering**, Volume 47, Page 1343, 2000.

[N19] S. Hao and W.K. Liu, *"Bimaterial Interfacial Crack Growth with Strain Gradient Theory"*, **J. Engineer Material Tech., Trans. ASME**, Volume 121, Page 413, 1999.

[N20] K.T. Danielson, S. Hao, W.K. Liu, A. Uras, and S. Li, *"Parallel Computation of Meshless Methods for Elicit Dynamic Analysis"*, **Int. J. For Numeric Methods Engineer**, Volume 47, Page 1323, 2000.

[N21] W. K. Liu, S. Hao, T. Belytschko, S. Li, and C.T. Chang, *"Multiple Scale Meshfree Methods for Damage, Fracture, and Localization"*, **Computational Material Science Engineer**, Volume 16, Page 197, 1999.

[N22] S. Hao, A. Cornec, and K.H. Schwalbe, *"Plastic Stress-Strain Fields and Limit Loads of a Plane Strain Cracked Tensile Panel with a Mismatched Welded Joint"*, **Int. J. Solids Structure**, Volume 34, Page 297, 1997.

[N23] S. Hao and W. Brocks, *"The Gurson-Tvergaard-Needleman-Model for Rate and Temperature-Dependent Materials"*, **Computational Mechanics**, Volume 20, Page 34, 1997.

[N24] W. Brocks, S. Hao, and D. Steglich, *"Micromechanical Modeling of the Damage and Toughness Behaviour of Nodular Cast Iron Material"*, **J. de Physique IV**, Volume 6, Page 43, 1996.

[N25] S. Hao, J. D.Landes, A. Cornec., and K.H. Schwalbe, *"Study of the Load-Separation Principle and Procedure to Estimate np-Factor for Structures with Different Geometry"*, **Int. J. of Fraction**, Volume 69, Page 251, 1994/1995.

[N26] Hao Shoe (S. Hao), Yu Shou-Wen, Huang Keh-Chin, *"The Asymtotic Finite Deformation Solutions of the Damage Fields at Crack Tip and Blunted Notch-Tip for Nonlinear Material"*, **European J. Mech., A/Solids**, Volume 13, Page 227, 1994.

[N27] A. Cornec., S. Hao, and K.H. Schwalbe, *"Anwendung des Engineering Treatment Model ETM (auf gekerbte Strukturen)"* (in German), **Konstruktion**, Volume 46, Page 59, 1994.

[N28] S. Hao, A. Cornec, and K.H. Schwalbe, *"Engineering Treatment Model (ETM) for Crack Driving Force Estimation of Structures with Stress Concentration"*, **J. of Pressure Vessel Tech., ASME, Trans**., Volume 115, Page 164, 1993.

[N29] S. Hao, A. Cornec A., and K.H. Schwalbe, *"Rissbildung und Rissausbreitung unter Mehrachsiger mechanischer und thermischer Belastung"* (in German), **Deutscher Verband fuer Materialforschung und – pruefung**, Volume 25, Page 271, 1993.

[N30] D. McCabe, S. Hao, A. Cornec, K.H. Schwalbe, "*A fast method to estimate hp-factor for J measurement"*, **Int. J. of Fract**., Volume 60, R21, 1993.

Book Chapters:

[N31] S. Hao, B. Moran, D. Chopp, B. Rittman, "**Biofilm Growth: Perspectives on Two-Phase Mixture Flow and Fingerings Formation**", Mechanics and Reliability of Actuating Materials, p. 273-291, Springer, 2005.

[N32] S. Hao and J. Weertman, "**Ductile Cr-Alloys with Solute and Precipitate Softening**", in Multiscaling in molecular and continuum mechanics: biology, electronics and material science, edit. G.C.Sih, Springer, 2006

INVITED LECTURES AND KEY-NOTE PRESENTATION IN PROFESSIONAL MEETING

Invited lecture: "Damage Induced Crack – 3D Simulation", invited by Prof. D. Francois, Head of the Laboratory of Solid, Soil, and Fluid, Ecole Central de Paris, Paris, France, 1995

Invited lecture: "Interfacial Cracking", invited by Prof. P. Herrmann, University of Pardoborn, Pardoborn, Germany, 1996

Key-note presentation: "Multi-Scale Damage Model", The 6th National Congress. of U. S. A. Computational Mechanics Association, Dearborn, U.S.A., 2001.

Invited lecture: "Multi-scale, multi-physics structural-properties optimization in high strength, high toughness steel design", Dept. Mech. Engr., Tsinghua University, Beijing, China, 2004

Invited lecture: "Multi-scale, multi-physics analysis and computation", Dept. Mech. Engr., University of Iowa, Sept. Sept. 2005

Invited lecture: "A multi-scale, multi-physics methodology to assist design of high strength, high toughness alloys", Alcoa Tech. Center, Alcoa U. S. A., Jan. 2006

Key-note presentation: "Multi-scale modeling and computation of grain growth and intergranular fracture", The 11th Int. Conf. Plasticity, Anchloge, Alaska, U.S.A., 2007.

Key-note presentation: "A Generalized Dislocation Zone Model of Grain Boundary and Phase Field Simulation", The 12th Int. Conf. Plasticity, Kona, U.S.A., 2008.

Invited lecture: "Multi-Scale Analysis and Applications in New Alloys Design", Dept. Mech. Engr., Tsinghua University, Oct 30th, 2011

Invited lecture: "I35W Bridge Collapse Analysis", Structural, Mechanics & Materials Seminar, Dept. Civil & Environmental Engineering, UC Berkeley, March 12, 2012

Invited lecture: "I35W Bridge Collapse Analysis", T. Y. Lin International China, April 30th, 2012