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VITA

KYUNG K. CHOI, Roy J. Carver Professor of Mechanical Engineering,
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EDUCATION

B.S.	Physics	Yonsei Univ., Seoul, Korea	1966-1970
M.S.	Mechanical Engineering	The University of Iowa	1973-1977
Ph.D.	Applied Mathematics	The University of Iowa	1978-1980

AREAS OF RESEARCH INTEREST

Mechanical System Analysis, Design Sensitivity Analysis, and Optimal Design
Reliability-Based Design Optimization (Design for 6-Sigma), Possibility-Based Design Optimization, & Robust Design Optimization
Computational Methods in Mechanics
Mathematical Theory of Optimization and its Application to Mechanical Systems Design
Development of Design Sensitivity Analysis and Optimization Tools
Development of Simulation-Based Concurrent Engineering Environment and CAE Integration

ACADEMIC POSITIONS

University of Iowa	Post Doctoral Fellow	1981-1982
University of Iowa	Assistant Research Scientist	1982-1983
University of Iowa	Adjunct Assistant Professor	1981-1983
University of Iowa	Assistant Professor	1984-1986
University of Iowa	Associate Professor	1986-1990
U.S. Army Tank-Automotive Command, MI	Visiting Professor	Jun-Aug 1987
Scientific Research Lab., Ford Motor Company, MI	Senior Research Scientist	May-Sep 1989
University of Iowa	Professor	1990-2003
University of Iowa	Associate Director (Center for Computer-Aided Design)	1990-1993
University of Iowa	Deputy Director (Center for Computer-Aided Design)	1993-1995
University of Iowa	Acting Director (Center for Computer-Aided Design)	1995-1996

University of Iowa	Director (Center for Computer-Aided Design)	1996-2003
Gwangju Institute of Science and Technology	Adjunct Professor	1999-2007
Seoul National University	World Class University Professor	2008-2013
University of Iowa	Roy J. Carver Professor in Mechanical Engineering	2003-present

SCIENTIFIC AND PROFESSIONAL SOCIETIES

1. Fellow, American Society of Mechanical Engineers (ASME)
2. Fellow, Society of Automotive Engineers (SAE)
3. Fellow, American Institute of Aeronautics and Astronautics (AIAA)
4. Executive Committee Member, International Society for Structural and Multidisciplinary Optimization (ISSMO), 2003-2015
5. Co-establisher and co-chair of Society of Automotive Engineers (SAE) Ground Vehicle Reliability Committee, 2006-2010
6. President Elect, International Society for Structural and Multidisciplinary Optimization (ISSMO), 2007-2011
7. Appointed as a member of the Society of Automotive Engineers (SAE) Technical Standards Board, April 2009-October 2012
8. Member, Society of Automotive Engineers (SAE) Global Diversity Task Force, April 2009-January 2010
9. Appointed as a Member of European Research Council Referees 2008-2013
10. Member, Korean-American Scientists and Engineers Association (Established and served as the 1st President of Iowa City Chapter of KSEA, 1990)

EDITORS

1. Associate Editor, Mechanics Based Design of Structures and Machines, 1990-present
2. Review Editor, Journal of Structural and Multidisciplinary Optimization, 1995-present
3. Senior Advisor, Journal of Structural and Multidisciplinary Optimization, 2008-present
4. Editorial Board Member, International Journal of Reliability and Safety (IJRS), 2004-present
5. Associate Editor, Journal of Optimization Theory and Applications, 1993-2018
6. Associate Editor, ASME Journal of Mechanical Design, 2003-2006
7. Editorial Board Member, The Open Acoustics Journal, 2007-2009

ACCOMPLISHED TECHNOLOGY TRANSFERS

1. Over 15 years, Professor Choi and his students have been working with the U.S. Army Tank Automotive Research Development & Engineering Center (TARDEC) to develop sensitivity-based and sampling-based RBDO methods and software tools for minimization of the Army ground vehicle weights while improving durability and reliability as well as maintainability and mobility. The developed Iowa Reliability-Based Design Optimization (I-RBDO) software was successfully applied to obtain reliable optimum designs with significantly reduced weights and improved fatigue lives of U.S. Army High Mobility Trailer drawbar, Stryker A-arm, and HMMWV A-arm components. In 2013, Professor Choi has established the start-up company RAMDO Solutions to commercialize the I-RBDO software. The commercialized product is called RAMDO (Reliability Analysis & Multidisciplinary Design Optimization). The company is pursuing for the Army SBIR funding to enhance RAMDO and continue support US Army needs as well as commercial industries. A PIDO (Process Integration & Design Optimization) tool is essential for RBDO of multidisciplinary applications. For PIDO, two key capabilities need to be developed: (1) Process Integration (PI) is capability for seamless integration of diverse CAD/CAE tools for multidisciplinary analysis; and (2) Design Optimization (DO) is capability for multidisciplinary reliability analysis and RBDO. The first capability is focused on integration of CAD/CAE tools and user interfaces, whereas the second capability is focused on the computational engine to support multidisciplinary RBDO. As RAMDO is a computational engine for DO, it needs to be integrated with PI to have a complete PIDO capability. RAMDO Solutions, LLC has had non-exclusive licensing discussions to integrate our RAMDO with their PIDO softwares – HyperStudy and Isight – respectively, as soon as RAMDO is ready commercially. They are interested since RAMDO provides a powerful computational engine for RBDO that their PIDO softwares are lacking. This arrangement will provide a "win-win" partnership and provides an excellent opportunity to make RAMDO available to design engineers worldwide fast.

2. Professor Choi and his students developed continuum-based DSA and optimization theory and computational methods for noise, vibration, and harshness (NVH) and led a successful technology transfer to Ford Motor Company by delivering the leading edge software system CONTESA on a Ford Cray computer. The optimum car body design obtained using the CONTESA code was validated in 1994 with Ford building six optimized prototype cars (Sable) and tested at their Dearborn Proving Ground. Since then, Ford engineers used the CONTESA code for several car/truck vehicle programs to optimize the body design to reduce the vehicle weight/cost and production development time, while improving functionality, such as ride quality. In July 1998, Ford sent a letter to the University of Iowa Vice President for Research acknowledging Professor Choi and his team for their commitment to maintain quality of research and contributions in research products developed at Iowa.

HONORS, PRIZES, AND AWARDS

1. NIH National Research Award, 1983
2. Faculty Scholar Award (The University of Iowa), September 1987-August 1990

3. Outstanding ME Professor Award, UI Chapter of ASME, 1987
4. Phi Beta Delta (Honor Society for International Scholars), 1988
5. College of Engineering Faculty Excellence Award for Service (The University of Iowa), 1996
6. Received the Black and Decker Best Paper Award in the 2001 ASME Design Automation Conference, September 11, 2001.
7. Invited to the 2nd Max Planck Workshop on Engineering Design Optimization, Nyborg, Denmark, October 12-14, 2001.
8. His Ph.D. Student Mr. Byeng-Dong Youn received a Silver Prize in the 2001 (8th Annual) Samsung Humantech Thesis Prize (HTP) competition. This is the highest prize awarded in the division of Mechanical Engineering and Design.
9. Received the 2002 Maurice Simpson Technical Editors Award in Design, Test, and Evaluation from the Institute of Environmental Sciences and Technology, April 30, 2002.
10. College of Engineering Faculty Excellence Award for Research (The University of Iowa), 2003.
11. Iowa Board of Regents Award for Faculty Excellence (State of Iowa), 2003.
12. Received the Best Paper Award in the 2003 ASME Design Automation Conference, September 4, 2003.
13. His Student Dr. Byeng-Dong Youn received the **ISSMO/Springer Prize 2003 for A Young Scientist** based on the paper "Efficient Evaluation Approaches for Probabilistic Constraints in Reliability-Based Design Optimization" co-authored by Youn, B.D., Choi , K.K., and Yang, R-J.
14. Received **ASME Design Automation Award**, September 2006.
15. His Ph.D. Student Mr. Ikjin Lee received the **ISSMO/Springer Prize 2007 for A Young Scientist** based on the paper "Dimension Reduction Method (DRM) Based RBDO for Highly Nonlinear Systems" co-authored by Lee, I., Choi, K.K., Du, L., and Gorsich, D.
16. His Ph.D. Student Miss. Yoojeong Noh received the runner-up recognition for **ISSMO/Springer Prize 2007 for A Young Scientist** based on the paper "New Transformation of Dependent Input Variables Using Copula for RBDO" co-authored by Lee, I., Choi, K.K., and Du, L.
17. University of Iowa **Graduate College Outstanding Faculty Mentor Award**, 2012.
18. University of Iowa **Start-up of the Year Award**, 2017.
19. His Ph.D. student Mr. Weifei Hu received the 1st prize at the 7th Annual IWEA Conference for his poster presentation "A New Fatigue Analysis Procedure for Composite Wind Turbine Blades," co-authored by Hu, W., Choi, K.K., Zhupanska, O., and Buchholz, J.H.J., March 2014.

20. His Ph.D. student Ms. Minyeong Moon was one of the Finalists in the Best Student Poster Competition for the 20th ARC Annual Program Review based her poster “Validation Framework for Computer Simulation,” May 20, 2014.
21. A paper "Reliability-based design optimization of wind turbine blades for fatigue life under dynamic wind load uncertainty," co-authored by Weifei Hu, K.K. Choi & Hyunkyoo Cho, has appeared October 22, 2016 on Renewable Energy Global Innovations as a Key Scientific Article.
22. His Ph.D. student Ms. Minyeong Moon was one of the Finalists in the Best Student Poster Competition for the 23rd ARC Annual Program Review based her poster “Confidence-Based Reliability Assessment Accounting for Insufficient Input and Output Experimental Data,” May 10, 2017.
23. 2017 Albert Nelson Marquis Lifetime Achievement Award.
24. His former Ph.D. student and current postdoctoral research scholar, Dr. Min-yeong Moon, has been selected to attend the Rising Stars in Mechanical Engineering workshop for 30 junior academic women in mechanical engineering from across the nation at the Massachusetts Institute of Technology, October 25-26, 2018.
25. Cited in American Men and Women of Science, 16th-21st Editions, 1986-
26. Cited in The International Directory of Distinguished Leadership, 3rd-5th Editions, 1990-
27. Cited in International Leaders in Achievement, 2nd Edition, 1990-
28. Cited in Who's Who in The Midwest, 22nd-23rd Editions, 1989-
29. Cited in Who's Who in Technology, 5th-6th Editions, 1986-
30. Cited in Who's Who of Emerging Leaders in America, 4th Edition, 1990-
31. Cited in Who's Who in American Education, 3rd-8th Editions, 1991-
32. Cited in Who's Who in Science and Engineering, 1991-2009
33. Cited in Who's Who Among Asian Americans, 1st Edition, 1994-
34. Cited in Who's Who in the World, 12th-31th Editions, 1994-
35. Cited in Who’s Who in America, 55th-69th Editions, 2000-
36. Cited in Who’s Who in Computational Science and Engineering, 2003-
37. Cited in Who’s Who Among American Teachers & Educators, 11th Edition, 2006-
38. Cited in International Who’s Who of Professionals, 2000-
39. Cited in Most Admired Men and Women of The Year, 2nd Edition, 1994-95
40. Cited in Cambridge Who’s Who, 2008-

COMMITTEE - NATIONAL & INTERNATIONAL

1. Member of the ASME Committee on Design Theory and Methodology, 1988 – 92
2. Member of ASME Design Automation Committee, 2001 –

3. Member of the AIAA Technical Committee on Multidisciplinary Design Optimization, 1989 - 93

4. Member of the CALS/CE Mechanical Tools and Technology Task Subgroup, 1989 - 92

5. Advisory Board Member of The World Congress on Optimal Design of Structural Systems, Structural Optimization 93, Rio de Janeiro, Brazil, August 2-6, 1993

6. Member of Technical Advisory Committee, NATO Science for Stability Project - Quick CAD, CEMUL, Instituto Superior Technico, Lisboa, Portugal, 1993-95

7. Chair of Midwest Chapter Council of Korean-American Scientists and Engineers Association, 1995-1996.

8. Member of National Science Foundation Multidisciplinary Research (HPCC), to review pre-proposals that range $300,000-$800,000/year for a period of three to five years, April 10, 1995.

9. Member of International Scientific Committee, The First World Congress of Structural and Multidisciplinary Optimization, Goslar, Germany, May 28-June 2, 1995

10. Panel member for National Science Foundation Design and Integration Engineering Program, to review unsolicited proposals June 6, 1995.

11. Member of International Scientific Committee, The Second World Congress of Structural and Multidisciplinary Optimization, Zakopane, Poland, May 26-30, 1997

12. Member of International Scientific and Advisory Board, International Symposium on Optimization and Innovative Design (OPID97), Tokyo, Japan, July 28-30, 1997

13. Member of Editorial Board of the Fifth International Conference on Computational Structures Technology, Leuven, Belgium, September 6-8, 2000

14. Paper review coordinator for the 27th Design Automation Conference of 2001 ASME Design Engineering Technical Conferences, March 2001 (1 paper).

15. Member of International Scientific Committee, The Fourth World Congress of Structural and Multidisciplinary Optimization, Dalian, China, June 4-8, 2001.

16. Member of Panelists for the NSF Graduate Research Fellowship Program (GRFP), Washington DC, 2002-04.

17. Paper review coordinator for the 28th Design Automation Conference of 2002 ASME Design Engineering Technical Conferences, February 2002 (3 papers).

18. Member of Organizing Committee for The Second China-Japan-Korea Joint Symposium On Optimization of Structural and Mechanical Systems, Busan, Korea, November 4-8, 2002.

19. Paper review coordinator for the 29th Design Automation Conference of 2003 ASME Design Engineering Technical Conferences, March 2003 (4 papers).

20. Member of ISSMO Publications Committee, 2003-present.

21. Co-Organizer of the Pre-nominated Sessions on "Structural Optimization" of 21st International Congress of Theoretical and Applied Mechanics (ICTAM), Warsaw Poland, 15-21 August 2004.

22. Track leader for Modeling and Simulation, 10th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Aug. 30 - Sept. 1, 2004, Albany, New York.

23. Session Organizer for Reliability & Robust Design in Automotive Engineering at SAE 2004 World Congress, Detroit, Mi, March 8-11, 2004.

24. Paper review coordinator for the 30th Design Automation Conference of 2004 ASME Design Engineering Technical Conferences, March 2004 (4 papers).

25. Paper review coordinator for the 31st Design Automation Conference of 2005 ASME Design Engineering Technical Conferences, March 2005 (4 papers).

26. Member of the Papers Committee for WCSMO6, Rio de Janeiro, Brazil, May 30 – June 3, 2005.

27. Chairman for North America of International Organizing Committee, WCSMO6, Rio de Janeiro, Brazil, May 30 – June 3, 2005.

28. Member of Scientific Advisory Board, Third M.I.T. Conference on Computational Fluid and Solid Mechanics, June 14 - 17, 2005.

29. Paper review coordinator for the 32nd Design Automation Conference of 2006 ASME Design Engineering Technical Conferences, March 2006 (3 papers).

30. Member of Scientific Committee and a Keynote Lecturer at the III European Conference on Computational Solid and Structural Mechanics, Lisbon, Portugal, June 5-9, 2006.

31. External Reviewer for the BK21 Project of Hanyang University Innovative Design Education Program for Mechanical Engineers, 2006-2013.

32. Member of Panelist at the Ground vehicle Reliability session at 2006 DoD Maintenance Symposium & Exhibition, Reno, NV, October 23-26, 2006.

33. Chair of the WCSMO-7 International Papers Committee, Seoul, Korea, May 21-25, 2007.

34. Paper review coordinator for the 33rd Design Automation Conference of 2007 ASME Design Engineering Technical Conferences, March 2007 (4 papers).

35. Member of the ASME Design Automation Honors and Awards Committee - 2007, 2008 & 2010.

36. Paper review coordinator for the 34th Design Automation Conference of 2008 ASME Design Engineering Technical Conferences, March 2008 (3 papers).

37. Paper review coordinator for the 35th Design Automation Conference of 2008 ASME Design Engineering Technical Conferences, March 2009 (4 papers).

38. Member of the Advisory Committee, WCSMO-8, Lisbon, Portugal, June 1-5, 2009.

39. Member of Panelists at the Wind Energy Session at World Green Energy Forum 2010, Hyundai Hotel, Gyeongju, Korea, November 18, 2010.

40. Member of the Advisory Committee, WCSMO-9, Shizuoka, Japan, June 13-17, 2011.

41. Member of the International Advisory Board, EngOpt 2012, Rio de Janeiro, Brazil, July 2-6, 2012.

42. Member of the Local Organizing Committee, WCSMO-10, Orlando, FL, May 20-24, 2013.

43. Member of the International Advisory Committee, International Conference on Computational Design in Engineering (CODE2012), November 13~16, 2012 Seoul, Korea.

44. Member of **ExCom** of the US Army Automotive Research Center, 2011.

45. Member of **US Army Tank Automotive Research, Development and Engineering Center (TARDEC) Research Review Board (RBB)**- 2010 (Reviewed 37 Scientists and Engineers for Promotions).

46. Member of **US Army Tank Automotive Research, Development and Engineering Center (TARDEC) Research Review Board (RBB)** - 2012 (Reviewed 34 Scientists and Engineers for Promotions).

47. Member of Scientific Committee, International Conference on Engineering and Applied Sciences Optimization (OPTI 2014), Kos Island, Greece, June 4-6, 2014.

48. Member of the International Organizing Committee, EngOpt 2016, 5th International Conference of Engineering Optimization, Iguazu Falls, Brazil, June 19-23, 2016.

49. External Reviewer of sixteen U.S. Army TARDEC FY15 In-House Laboratory Independent Research (ILIR) Projects, April 2016.

50. Member of **US Army Tank Automotive Research, Development and Engineering Center (TARDEC) Research Review Board (RBB)** - 2016 (Reviewed 63 Scientists and Engineers for Promotions).

COMMITTEE - THE UNIVERSITY OF IOWA

1. Graduate Committee, Mech. Eng. Dept., 1984-87, 1991- 92, 1996- AY (Chairman 1986-87)
2. Promotion and Tenure Committee, Mech. Eng. Dept., 1988, 89, 90, & 91
3. Library Committee, College of Engineering, 1988-89 AY2
4. Lectures Committee, College of Engineering, 1990-91 AY
5. Chair, Lectures Committee, Mechanical Engineering, 1998-99 AY
6. Chair, Undergraduate Committee, Mechanical Engineering, 2000-01 AY
7. Dean Search Committee, College of Engineering, 1991-92 AY
8. Engineering Faculty Council, 1992-95 AY
9. Chair, Mechanical Systems Faculty Search Committee, Mech. Eng. Dept., 1992-93 AY
10. Chair, Faculty Search for Three Positions, Dynamics, Structures, and Thermal/Fluid, Mech. Eng. Dept., 1993-94 AY
11. Chair, Engineering Faculty Council, 1994-95 AY
12. Chair, College of Engineering Strategic Planning Committee, 1994-96
13. Mechanical Engineering Faculty Search Committee, 1991-92, 1994-95 AY
14. Special Promotion and Tenure Committee, College of Engineering, 1997-99 AY
15. Dean Search Committee, College of Engineering, 1998-2000
16. College of Engineering Strategic Planning Committee, 1999-2000 AY
17. Chair, Promotion and Tenure Committee, Mech. Eng. Dept., 1999-2000 AY
18. Chair, ME/CCAD Faculty Search Committee, Mech. Eng. Dept., 2000-01 AY
19. Tenure Review Committee of a Biomedical Engineering Faculty, 2001-02 AY
20. Chair, MIE/CCAD Faculty Search Committee, Mech. & Ind. Eng. Dept., 2001-03 AY
21. College of Engineering Graduate Studies and Research Advisory Council (GRAC), 2002-2006 AY
22. Chair, Mechanical and Industrial Engineering Self-Study Committee, 2003-04 AY
23. Chair, Mechanical Engineering Graduate Committee, 2004-05 AY

24. Chair, Dean's Advisory Promotion and Tenure Committee, 2005-06 AY
25. Member, Dean's Advisory Promotion and Tenure Committee, 2006-07 AY
26. Chair, Mechanical Engineering Graduate Committee, 2005-06 AY
27. Member, Strategic Planning, Mech. & Ind. Eng. Dept., 2005-11 AY
28. Chair, Promotion and Tenure DCG, Mechanical & Industrial Eng. Dept., 2006-07 AY
29. Chair, Post-tenure Review Committee, Mechanical & Industrial Eng. Dept., 2006-07 AY
30. Chair, Mechanical Engineering Graduate Committee, 2007-08 AY
31. Engineering Faculty Council, 2008-10 AY
32. Chair, Promotion and Tenure DCG, Mechanical & Industrial Eng. Dept., 2009-10 AY
33. Chair, Post-tenure Review Committee, Mechanical & Industrial Eng. Dept., 2009-10 AY
34. Chair, Mechanical & Industrial Eng. Dept. DEO Search Committee, 2010
35. Chair, MIE Faculty Search for Robotics, 2010-11 AY
36. Chair, Promotion and Tenure DCG, Mechanical & Industrial Eng. Dept., 2011-12 AY
37. Chair, Post-tenure Review Committee, Mechanical & Industrial Eng. Dept., 2011-12 AY
38. Chair, Faculty Search Committee for Three Positions; Wind Energy Dynamics, Wind Energy Manufacturing, and Renewable Energy, 2011-12 AY
39. Member, Regents Award for Faculty Excellence Selection Committee, 2012-13 AY
40. Member, Faculty Perception of Administrator (FPOA) Committee, 2012-13 AY

OTHER PROFESSIONAL ACTIVITIES

1. Chaired a session at NATO/NASA/NSF/USAF Advanced Study Institute: Computer Aided Optimal Design, Troia, Portugal, June 29-July 11, 1986.
2. Visited Nice, France in November, 1987 to carry out joint research with the research group at University of Nice under NSF grant.
3. Vice-Chairman of a session at 15th ASME Design Automation Conference, Montreal, Quebec, Canada, September 17-21, 1989.

4. Chaired a session at First Annual Symposium on Mechanical System Design in A Concurrent Engineering, Iowa City, Iowa, October 24-25, 1989.

5. Chaired a session at 31st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials (SDM) Conference, Long Beach, CA, April 2-4, 1990.

6. Chaired two sessions at Third Air Force/NASA Symposium on Recent Advances in Multidisciplinary Analysis and Design Optimization, San Francisco, CA, September 24-26, 1990.

7. Chaired a session at Fourth AIAA/USAF/NASA/OAI Symposium on Multidisciplinary Analysis and Optimization, Cleveland, OH, September 21-23, 1992.

8. Chaired a session at 5th KSEA Midwest Conference, Minneapolis, MN, May 21, 1994.

9. Chaired a session at the First World Congress of Structural and Multidisciplinary Optimization, Goslar, Lower Saxony, Germany, May 28-June 2, 1995.

10. Organized and Chaired 6th Midwest Korean-American Scientists and Engineers Association Conference, Iowa City, IA, USA, June 20-21, 1996.

11. Chaired a session at Sixth AIAA/USAF/NASA/OAI Symposium on Multidisciplinary Analysis and Optimization, Bellevue, WA, September 4-6, 1996.

12. Chaired a session at International Symposium on Optimization and Innovative Design (OPID97), Tokyo, Japan, July 28-30, 1997.

13. Chaired a session at 7th AIAA/NASA/USAF/ISSMO Symposium on Multidisciplinary Analysis and Optimization, St. Louis, MO, September 2-4, 1998.

14. Chaired a session at 3rd World Congress of Structural and Multidisciplinary Optimization, Buffalo, NY, May 17-21, 1999.

15. Co-Chair of Organizing Committee of Workshop on Meshfree Methods, Part I Method Developments and Applications, Chicago, Il, June 11-13, 2000.

16. Co-chaired a session at Workshop on Meshfree Methods, Part I Method Developments and Applications, Chicago, Il, June 11-13, 2000.

17. Chair of Organizing Committee of Advanced Manufacturing Technology Track of 2000 U.S.-Korea Conference on Science and Technology, Entrepreneurship, and Leadership, Chicago, Il, September 2-5, 2000.

18. Chaired a session at Advanced Manufacturing Technology Track of 2000 U.S.-Korea Conference on Science and Technology, Entrepreneurship, and Leadership, Chicago, Il, September 2-5, 2000.

19. Co-chaired a session at 26th ASME Design Automation Conference, Baltimore, MD, September 10-14, 2000.

20. Chaired a session at ARC Conference, Ann Arbor, MI, May 15-16, 2001.

21. Chaired a session at 4th World Congress of Structural and Multidisciplinary Optimization, Dalian, China, June 4-8, 2001.

22. Chaired a session at 27th ASME Design Automation Conference, Pittsburgh, PA, September 9-12, 2001.

23. Chaired a session at 9th AIAA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Atlanta, GA, September 4-6, 2002.

24. Chaired two sessions at 28th ASME Design Automation Conference, Montreal, Canada, September 30-October 2, 2002.

25. Chaired a session at 5th World Congress of Structural and Multidisciplinary Optimization, Lido di Jesolo, Italy, May 19-23, 2003.

26. Chaired a session at Seventh U.S. National Congress on Computational Mechanics (USNCCM7), Albuquerque, New Mexico, USA, July 28 - 30, 2003.

27. Co-chaired a session at 29th ASME Design Automation Conference, Chicago, IL, September 2-6, 2003.

28. Co-Chaired a session in Reliability & Robust Design in Automotive Engineering at SAE 2004 World Congress, Detroit, MI, March 8-11, 2004.

29. Chaired a session at 10th AIAA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Albany, NY, August 30-September 1, 2004.

30. Chaired a Military Vehicle Technology Session at SAE 2004 World Congress, Detroit, MI, March 8-11, 2005.

31. Chaired a session at WCSMO6, Rio de Janeiro, Brazil, May 30 – June 3, 2005.

32. Organized a Special Session: Reliability and Robust Design (four sessions) at 3rd M.I.T. Conference on Computational Fluid and Solid Mechanics, Cambridge, MA, June 14-17, 2005.

33. Chaired a session at 31th ASME Design Automation Conference, Long Beach, September 24-28, 2005.

34. Organized a Mini-symposium “Mini-symposium: Design Optimization Under Uncertainty,” at the III European Conference on Computational Solid and Structural Mechanics, Lisbon, Portugal, June 5-9, 2006.

35. Chaired a Keynote Lectures Session at the III European Conference on Computational Solid and Structural Mechanics, Lisbon, Portugal, June 5-9, 2006.

36. Co-Chaired a session at 32th ASME Design Automation Conference, Philadelphia, PA, September 11-13, 2006.

37. Chaired a session at WCSMO7, Seoul, Korea, May 21–25, 2007.

38. Chaired two sessions and co-chaired a session at 33th ASME Design Automation Conference, Las Vegas, NV, September 4-7, 2007.

39. Co-Chaired a session at 34th ASME Design Automation Conference, New York, NY, August 3-6, 2008.

40. Chaired a session at 12th AIAA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Victoria, British Columbia, Canada, September 11-12, 2008.

41. Chaired a session and Plenary Panel Session at WCSMO-8, Lisbon, Portugal, June 1–5, 2009.

42. Chaired the General Assembly of the International Society for Structural and Multidisciplinary Optimization (ISSMO) as the President, Lisbon, Portugal, June 4, 2009.

43. Chaired a session at 35th ASME Design Automation Conference, San Diego, CA, August 30-September 2, 2009.

44. Chaired a session and Plenary Panel Session at WCSMO9, Shizuoka, Japan, June 13-17, 2011.

45. Chaired the General Assembly of the International Society for Structural and Multidisciplinary Optimization (ISSMO) as the President, Shizuoka, Japan, June 16, 2011.

46. Chaired a session at 37th ASME Design Automation Conference, Washington, DC, August 29-31, 2011.

47. Chaired a session at 38th ASME Design Automation Conference, Chicago, Illinois, August 12-15, 2012.

48. Chaired two sessions at WCSMO10, Orlando, FL, May 19-24, 2013.

49. Chaired the Plenary session State-of-the-Art Discussion (SOTA) at WCSMO11, Sydney, Australia, June 11, 2015.

50. Chaired a session at Automotive Testing Expo 2016, KIINTEX, Seoul, Korea, January 19-21, 2016.

51. Chaired a Technical Session at 12th World Congress on Structural and Multidisciplinary Optimization, June 5-9, 2017, Braunschweig, Germany.

52. Chaired a session at the ASME Verification and Validation Symposium, Minneapolis, MN, May 16-18, 2018.

PRINCIPAL INVESTIGATOR ON CONTRACTS AND/OR GRANTS

1. Design Sensitivity Analysis and Optimization of Built-Up Structures, NASA, October 1, 1982 - September 1, 1984, (Co-Principal Investigator with E.J. Haug) $108,875

2. Optimization of Distributed Parameter Structures, Theory and Applications, National Science Foundation, January 15, 1983 - June 30, 1986, (travel grant) (Co-Principal Investigator with E.J. Haug) $14,500

3. Distributed Parameter Structural Design Sensitivity Analysis and Optimization, National Science Foundation, December 1, 1984 - November 30, 1987, (Co-Principal Investigator with E.J. Haug) $154,180

4. Design Sensitivity Analysis and Optimization of Built-Up Structures, NASA, October 1, 1984 - December 31, 1986 $112,852

5. Stress Analysis of M109 Hull, BMY Inc., November 1, 1985 - April 30, 1986 $10,000

6. Feasibility Study for Application of Design Sensitivity Analysis for Track Vehicle, NSF-TACOM-NASA I/UCRC (Acct. No. G191-41), September 1, 1988 -February 28, 1990 $17,500

7. Design Sensitivity Analysis and Optimization of Structural Systems, NSF-TACOM-NASA I/UCRC (Acct. No. G191-06), July 1, 1987 - September 30, 1988 $130,000

8. Design Sensitivity Analysis and Optimization of Structural Systems, NSF-TACOM-NASA I/UCRC (Acct. No. G191-06), October 1, 1988 - September 30, 1989 $95,000

9. Design Sensitivity Analysis and Optimization of Structural Systems, NSF-TACOM-NASA I/UCRC (Acct. No. G191-06), October 1, 1989 - September 30, 1990 $68,330

10. TACOM Pilot Project - Design Sensitivity Analysis Workstation, NSF-TACOM-NASA I/UCRC (Acct. No. G191-41), March 1, 1989 - December 31, 1989 $100,425

11. Optimization of Dynamic Frequency Response of Total Vehicle System Subjected to Dynamic Loads, NSF/Ford (Acct. No. G191-82), May 8, 1989 - February 28, 1991 $11,314

12. Implement and Test Continuum Design Sensitivity Analysis Method for Forced Frequency Response, Ford Motor Co. (Acct. No. N907, July 15, 1989 - January 21, 1991 $120,000

13. Configuration DSA Method for NVH and Safety Responses, University Research Program, Ford Motor Co. (Acct. No. 1 79089 00), January 1, 1991 - June 30, 1994 $320,000

14. Develop Capability to Compute Sensitivity of Responses wrt Beam and Plate Parameters, Ford Motor Co. (Acct. No. 17908900), November 9, 1993 - June 1, 1994 $85,000

15. Management of Computer Aided Engineering Systems for Concurrency, National Science Foundation (Acct. No. 1 51161 00), August 15, 1990 - January 31, 1993 $99,985

16. Military Vehicle Workstation Software Development, FMC, November 13, 1991 - February 13, 1992 $4,551

17. I/UCRC Simulation and Design Optimization of Mechanical Systems, NSF/TACOM (Acct. No. 1 51100 02), July 20, 1990 - February 28, 1992 $159,000

18. Research in Simulation and Design, NSF TIE Project with Maryland, May 25, 1990 - February 28, 1991 $50,000

19. NSF Budgets for Funding, NSF (Grant No. ECD-8715397), April 26, 1991 - February 28, 1992 $33,000

20. Research in Simulation and Design, NSF TIE Project with Prairie View A&M, May 25, 1990 -February 28, 1991 $12,500

21. Research in Simulation and Design, NSF/TACOM, (Acct. No. 1 51100 02), May 25, 1990 - February 28, 1991 $88,200

22. Tracked Vehicle Concurrent Engineering Tool Development, Integration, and Validation, DARPA, (Acct. No. 1 48017 00), September 19, 1991 - March 31, 1994 $1,367,492

23. I/UCRC Pilot Projects in Simulation-Based Concurrent Engineering of Military Vehicles and Space Flight Systems, NSF/DMSO, (Acct. No. 1 51100 01), September 15, 1992 - February 28, 1994 $589,000

24. I/UCRC Pilot Projects in Simulation-Based Concurrent Engineering of Military Vehicles and Space Flight Systems, NSF/TACOM, (Acct. No. 1 51100 02), September 15, 1992 - February 28, 1994 $36,000

25. I/UCRC Pilot Projects in Simulation-Based Concurrent Engineering of Military Vehicles and Space Flight Systems, NSF/TACOM (Acct. No. 1 51100 02), February 26, 1993 - February 28, 1994 $37,500

26. Collaboration Technologies for Large Scale Mechanical System Concurrent Engineering, DARPA (Acct. No. 1 48017 01), April 12, 1993 - April 12, 1995 $438,554

27. Industrial I/UCRC Memberships, BMY, Case, Caterpillar, Deere, FMC, Ford, and GD Land, May 1, 1990 - September 30, 1993 $146,000

28. Industrial I/UCRC Membership, John Deere, June 14, 1990 - June 13, 1991 $8,000

29. Industrial I/UCRC Membership, John Deere, January 8, 1992 -January 7, 1993 $8,000

30. Industrial I/UCRC Membership, Ford, July 1, 1992 - June 30, 1993 $8,000

31. Federal I/UCRC Membership, AMSAA, NSF I/UCRC Renewal, P.M. Trade, Robins AFB, and TACOM, July 1, 1992 - June 30, 1993 $117,807

Subtotal External Funding $4,551,565 (KK's Own Expenditures)

32. Simulation Based Design for System Supportability and Human Factors, DMSO (Acct. No. 1 51100 01), September 1, 1992 - August 31, 1994 $726,000

33. GDEB Simulation Based Design for Submarines and Surface Ships, GDEB (Acct. No. 1 48403 00), May 1, 1993 - August 31, 1994 $195,000

34. Machinery Cradle Simulation Based Design Environment Study, Navy Project Office (Acct. No. 15110011), September 1, 1993 - February 28, 1994 $47,400

35. Prediction of Electronic Equipment Reliability Using Computer Modeling and Simulation, DMSO (Acct. No. 1 51100 10), September 1, 1993 - August 31, 1995 $444,500

36. Simulation-Based Concurrent Engineering for Military Vehicles, NSF/TACOM (Acct. No. 15110002), January 1, 1994 - September 30, 1994 $275,000

37. Simulation-Based Concurrent Engineering for Military Vehicles, NSF/TACOM (Acct. No. 15110005), January 1, 1994 - September 30, 1994 $50,000

38. Computation of Fatigue Life Prediction and Design Sensitivity Analysis, Ford (Acct. No. 17908900), July 1, 1994-December 31, 1994 $60,000

39. HMMWV Rail Impact Test Application, MTMC (Acct. No. 15110014), June 1, 1994-December 31, 1994 $60,007

40. Information Integration for Simulation-Based Design and Manufacturing, NSF (Acct. No. 115140100), October 1, 1994-September 30, 1997 $706,770

41. Reliability Simulation Methodology for Engine Management Subsystems, General Motors, November 1, 1994-October 30, 1997 $300,000

42. Configuration Design Sensitivity Analysis for Nonlinear Built-up Structures for Safety, Automotive Research Center, September 1, 1994-August 31, 1997 $200,710

43. Design Sensitivity Analysis of Fatigue Life, Automotive Research Center, September 1, 1994-August 31, 1997 $275,891

44. Research Collaboration with CCAD (UI) and CCED, KAIST, April 1, 1996-December 31, 1998 $587,970

45. KATECH-Survey of Advanced Driving Simulator, KATECH, April 1, 1997-September 30, 1997 $31,258

46. Acquisition of High Performance Computing Environment for the CCAD NSF Major Research Instrument (MRI) Grant, September 1997, (30%=$152,546) $508,486

47. Large Deformation Analysis and Design Optimization of Automotive Structures Using Meshless Methods, Ford Motor Co., March 1, 1998-February 28, 2001 (50%=$75,000) $150,000

48. Optimized Meshless Algorithms for Seamless Integration of CAD, Simulation and Design, NSF, October1, 1998-September 30, 2001 (24.5%=$388,086) $1,481,347

49. Commercialization of DRAW and DSO Software, MDI, September 11, 1998-September 1, 2000 $400,000

50. Structural Shape Design Optimization Using Meshfree Method, General Motors, September 15, 1999-December 31, 1999 $5,000

Subtotal External Funding $9,532,703 (KK's Own Expenditures)

51. Automotive Research Center Phase II, ARC, July 1, 1998-Dec 31, 2003 $652,500

52. Meshfree Formulation, Design Sensitivity Analysis, and Optimization for 3-Dimensional Shell Structural Applications, General Motors, January 1, 2000-December 31, 2000 (50%= $81,820) $163,639

53. Mechanical Physics of Failure: Vehicle Fatigue Life Simulation, Experimental Validation, and Reliability Analysis, US AMSAA, April 2000-May 2003 $259,352

54. Microsoft Grant for Software, Microsoft Corp., November 31, 2000 $123,963

55. Meshfree Formulation, Design Sensitivity Analysis, and Optimization for 3-Dimensional Shell Structural Applications, General Motors, May 2001-December 2001 (50%=$50,342) $100,684

56. Physics of Failure: High Mobility Trailer (HMT) Fatigue Life Design Optimization, US AMSAA, September 2001-April 2003 $127,472

57. Reliability Based Design Optimization, Ford, June 2001-December 2002 $20,000

58. Uncertainty and Reliability-Based Design Optimization, US TACOM, October 2002-September 2003 (63.3%=$95,000) $150,000

59. Pilot Project on Shape Design Optimization Using Meshfree Method, Caterpillar, February 2003-June 2003 $2,500

60. Durable Design of Drum Washing Machine Subject to High Spin Speed, LG, October 2002-October 2004 $92,011

61. Predictive and Analytical Methods for Rapidly Assessing the Reliability of Commercial Electronic Packaging for Military/Industrial Environments, Rockwell-Collins, January 1, 1999-December 31, 2003 (50%=$143,750) $287,500

62. Durability Analysis and Validation of Stryker A-Arm, US AMSAA, May 2003-December 2004 $101,998

63. Automotive Research Center Phase III, ARC, July 9, 2004-July 8, 2005 $350,000

64. Integrating Stochastic Engineering Models in A Distributed Environment in A Distributed Environment, Army SBIR-Ghiocel Technologies, May 2004-September 2006 $124,500

65. Durability Analysis of Stryker Components, US AMSAA, August 16, 2004-August 30, 2005 $30,000

66. Automotive Research Center Phase III, ARC, July 9, 2004-Dec 31, 2005 $403,057

67. Demonstration of Integrated Reliability- and Possibility-Based Design Optimization Processes for Durability of 994 Full Scale Model, Caterpillar, July 1, 2006 -December 31, 2006 $11,200

68. Automotive Research Center Phase III, ARC, January 1, 2006-Dec 31, 2006 $285,790

69. Automotive Research Center Phase III, ARC, January 1, 2007-Dec 31, 2007 $200,000

70. Microsystems DFM Methodology Technical Consulting Project, Samsung, January 1, 2007-October 31, 2007 $27,848

71. RBDO for System Level Ground Vehicle Optimization, US Army TARDEC, July 1-December 31, 2007 $93,474

72. RBDO/PBDO with Full Consideration of Input Uncertainties, Automotive Research Center Phase III, ARC, January 1, 2008-Dec 31, 2008 $230,000

73. RBDO for System Level Ground Vehicle Optimization, US Army TARDEC, January 1-December 31, 2009 $375,000

74. RBDO for System Level Ground Vehicle Optimization, US Army TARDEC, January 1-December 31, 2010 $300,000

75. System Reliability-Based Design Optimization Under Input and Model Uncertainties, US Army Research Offices (ARO), May 12, 2009-May 11, 2012 $305,756

76. Reliability-Based Design Optimization of Wind Power Structural Systems with Target Confidence Level, Iowa Alliance for Wind Innovation and Novel Development (IAWIND), July 15, 2010-July 14, 2013 $300,000

77. RBDO for System Level Ground Vehicle Optimization, US Army TARDEC, January 1-December 31,
2011 $263,190

78. Bridging-Scaled Isogeometric Optimal Design, US Army TARDEC, January 1-December 31, 2011 $48,000

79. RBDO for System Level Ground Vehicle Optimization, US Army TARDEC, January 1-July 31, 2012 $95,000

80. System Reliability-Based Design Optimization with Associated Confidence Level under Simulation and Input Model Uncertainties, US Army TARDEC, January 1-December 31, 2012 $270,742

81. Harnessing Energy Flows in the Biosphere to Build Sustainable Energy Systems, NSF EPSCoR, September 2011-August 2016 $79,350

82. Integration of Parallelized Iowa RBDO (I-RBDO) Codes, US Army TARDEC, January 1-December 31, 2013 $230,000

83. Development of Simulation Model Validation Framework for RBDO, US Army TARDEC, January 2014-December 31, 2104 $105,219

84. Reliability Analysis and Multidisciplinary Design Optimization, ICE Commercialization GAP Fund, January 1-December 31, 2014 $74,994

Total External Funding $15.588 Million (KK's Own Expenditures)

PARTICIPATION IN RESEARCH CONTRACTS AND/OR GRANTS

1. Optimal Design of Distributed Parameter Structures, National Science Foundation, September 1, 1980 - February 29, 1984 $198,802

2. Design Sensitivity Analysis and Optimization of Built-Up Structures, NASA, October 1, 1981 - September 1, 1982 $55,000

3. Shape Optimal Design of Two- and Three-Dimensional Structural Elements, John Deere Co., November 1, 1981 - August 1, 1982 $13,800

ADVISOR OF RECENTLY GRADUATED STUDENTS

Master of Science

1. Marge Frederick Design Sensitivity Analysis with An Existing Code Using The

Adjoint Variable Method (M.S., December 1984)
(*No Information*)

2. Iulian Grindeanu Shape Design Sensitivity Analysis and Optimization of Thermoelastic Structures for Durability
(*Argon National Laboratory*) (M.S., May 1996)

3. Jian Tu A Performance Measure Approach in Reliability Based Structural Optimization
(*GM International Operations in Shanghai*) (M.S., August 1997)

4. Nicholas Gaul Morpher Based Shape Parameterization of Complex 3D Geometry for Design Sensitivity Analysis and Optimization
(Ph.D. Candidate at UI) (M.S., August 2008)

5. Sangjune Bae Variable Screening Method Using Statistical Sensitivity Analysis in RBDO
(Samsung SDI, Korea) (M.S., May 2012)

Doctor of Philosophy

1. Ren-Jye Yang Finite Element Computation of Structural Design Sensitivity
(*Ford Research Laboratory*) (Ph.D., May 1984)

2. Hee G. Lee Design Sensitivity Analysis and Optimization of Built-Up Structures
(*Professor at Korean Military Academy*) (Ph.D., December 1984)

3. Hwal G. Seong Shape Design Sensitivity Analysis Using Domain Information
(*Professor at Changwon University at Korea*) (Ph.D., May 1985)

4. Bernhard Dopker Sizing and Shape Design Sensitivity Analysis of Built-Up Structures Including Curved Components and Related Topics
(*Boeing Company.*) (Ph.D., August 1986)

5. Tse-Min Yao Shape Design Sensitivity Analysis and Optimization of Three-Dimensional Elastic Solids Using Geometric Modeling and Automatic Regridding
(*General Motors*) (Ph.D., December 1986)

6. Jose L.T. Santos Design Sensitivity Analysis of Nonlinear Structural Systems and Implementation with Established Finite Element Codes
(*Professor at Instituto Superior Tecnico at Portugal*) (Ph.D., May 1987)

7. Jong-Sang Park Design Sensitivity Analysis and Optimal Design of Nonlinear Structural Systems with Critical Loads
(*General Motors*) (Ph.D., December 1989)

8. Jaehwan Lee — Sizing and Shape Design Sensitivity Analysis of Dynamic Frequency Response of Vibrating Structures
(*Professor at Chungnam University at Korea*) (Ph.D., December 1989)

9. Sung-Ling Twu — Configuration Design Sensitivity Analysis and Optimization of Built-up Structures
(*General Motors*) (Ph.D., December 1990)

10. Kuang-H Chang — Shape Design Sensitivity Analysis and a What-If Design Workstation for Elastic Structural Components
(*Williams Companies Foundation Presidential Professor at University of Oklahoma*) (Ph.D., December 1990)

11. Mohan M. Godse — A Parametric Design Methodology for Concurrent Engineering (Co-Chair) (Ph.D., August 1991)
(*No Information*)

12. Semyung Wang — Design Sensitivity Analysis of Transient Response and Eigenvectors of Built-up Structures
(*Professor at Gwangju Inst. of Science & Technology at Korea*) (Ph.D., December 1991)

13. Inbo Shim — Design Sensitivity Analysis of Dynamic Frequency Responses of Structural-Acoustic Systems
(*Agency for Defense Development at Korea*) (Ph.D., May 1993)

14. Ching-Jung Chen — Second-Order Shape Design Sensitivity Analysis and Robust Design of 3-D Elastic Solids
(*North American Lighting*) (Ph.D., August 1994)

15. Youngho Park — Configuration Design Sensitivity Analysis of Nonlinear Structural Systems
(*Professor at New Mexico State University*) (Ph.D., December 1994)

16. Hsiu-Ying Hwang — Shape Design Sensitivity Analysis and Optimization of Elastic Solids Using p-Version Finite Element Method
(*Professor at National Taipei University of Technology*) (Ph.D., August 1995)

17. Xiaoming Yu — Reliability and Durability Based Design Sensitivity Analysis and Optimization
(*MSC Software Corporation*) (Ph.D., May 1996)

18. Wei Duan — Design Sensitivity Analysis and Optimization of Nonlinear Structures with Hyperelastic Materials (Ph.D., August 1996)
(*No Information*)

19. Seonho Cho — Design Sensitivity Analysis and Optimization of Transient Dynamic Response of Nonlinear Structures with Elastic-plastic Material and

Large Deformation
(*Professor at Seoul National University in Korea*) (Ph.D., May 1998)

20. Brian Seung Choi Shape and Topology Design Sensitivity Analysis and Optimization of Joining Mechanisms Using Doubly-Curbed Shell
(*Ford Motor Company*) (Ph.D., December 1998)

21. Nam Ho Kim Shape Design Sensitivity Analysis and Optimization of Nonlinear Static/Dynamic Structures with Contact/Impact
(*Professor at University of Florida*) (Ph.D., May 1999)

22. Iulian Grindeanu Shape Design Sensitivity Analysis and Optimization Using Meshless Methods
(*Argonne National Laboratory*) (Ph.D., August 1999)

23. Jian Tu Design Potential Concept for Reliability-Based Design Optimization
(*GM International Operations in Shanghai*) (Ph.D., December 1999)

24. Byeng-Dong Youn Advances in Reliability-Based Design Optimization and Probability Analysis
(*Professor at Seoul National University in Korea*) (Ph.D., December 2001)

25. Yiming Yuan Durability Design Sensitivity Analysis and Optimization of Flexible Mechanical Systems
(*Haldex Brake Products*) (Ph.D. May 2002)

26. Jun Dong Design Sensitivity Analysis and Optimization of High Frequency Structural-Acoustic Problems Using Energy Finite Element Method and Energy Boundary Element Method
(*LMS International*) (Ph.D., December 2004)

27. Chwail Kim Parallel Computed Reliability-based Topology Optimization Using Response Surface Method
(*Agency for Defense Development in Korea*) (Ph.D. December 2004)
(Co-advised with Prof. Semyung Wang at GIST)

28. Ki-young Yi Design Sensitivity Analysis and Optimization of Nonlinear Shell Structures with Contact Problem
(*GE Energy Infrastructure*) (Ph.D., May 2005)

29. Tao Zhang A Hybrid Method Using Response Surface and Pattern Search for Design Optimization of Microelectronics Packaging System
(*Engineering Mechanics Corp. of Columbus*) (Ph.D., May 2006)
(*Co-advised with Prof. Sharif Rahman*)

30. Liu Du Reliability- and Possibility-Based Design Optimization Using Inverse Analysis Methods

(*Kaiser Permanente*) (Ph.D., December 2006)

31. Ikjin Lee — Reliability- Based Design Optimization and Robust Design Optimization Using Univariate Dimension Reduction Method
(*Professor at KAIST in Korea*) (Ph.D., August 2008)

32. Yoojeong Noh — Input Model Uncertainty and Reliability-Based Design Optimization with Associated Confidence Level
(*Professor at Pusan National University in Korea*) (Ph.D., December 2009)

33. Liang Zhao — Reliability-Based Design Optimization Using Surrogate Model with Assessment of Confidence Level
(*Schlumberger*) (Ph.D., August 2011)

34. Hyeongjin Song — Efficient Sampling-Based RBDO by Using Virtual Support Vector Machine and Improving the Accuracy of the Kriging Method
(Ph.D., December 2013)

35. Hyunkyoo Cho — Efficient Variable Screening Method and Confidence-Based Method for Reliability-Based Design Optimization
(*Post-Doctoral Fellow*) (Ph.D., May 2014)

36. Nicholas Gaul — Modified Bayesian Kriging for Noisy Response Problems and Bayesian Confidence-Based Reliability-Based Design Optimization
(RAMDO Solutions, LLC) (Ph.D., August 2014)

37. Weifei Hu — Reliability-Based Design Optimization of Composite Wind Turbine Blades for Fatigue Life under Wind Load Uncertainty
(Post-Doctoral Fellow) (Ph.D., August 2015)
(*Co-advised with Profs. Zhupanska and Buchholz*)

38. Huaxia Li (*Co-advised with Prof. Hiroyuki Sugiyama)* — An Integrated Multibody Dynamics Computational Framework for Design Optimization of Wind Turbine Drivetrains Considering Wind Load Uncertainty (Ph.D., December 2016)

39. Min-yeong Moon — Confidence-Based Model Validation for Reliability Assessment and Its Integration with Reliability-Based Design Optimization
(*Post-Doctoral Fellow*) (Ph.D., August 2017)

NUMBER OF GRADUATE STUDENT ADVISEE - CURRENT

1. Ph.D. Students - Five (5)
2. M.S. Students - Zero (0)

SUPERVISOR OF POST DOCTORAL FELLOWS

1.	J.L.T. Santos	Development and Implementation of Design Workstation	1987-89
2.	Jaehwan Lee	Development of DSA Capability for Dynamic Frequency Response	1989-90
3.	Yul-W. Hyun	Optimal Design of Nonlinear Structural Systems with Finite Strains	1990-91
4.	Sung-Ling Twu	Configuration DSA Method for NVH and Safety Responses	1990-91
5.	K.H. Chang	Development of DSA and Optimization Workstation	1990-97
6.	Semyung Wang	Development of DSA and Optimization Capabilities for Noise, Vibration, and Harshness	1991-95
7.	Young Ho Park	Development of DSO for Commercialization	1996-00
8.	Nam Ho Kim	DSA and Optimization Methods for Nonlinear Structural Systems Using Meshfree Methods	1999-01
9.	Byeng-Dong Youn	Robust and Reliability-Based Design Optimization	2002-05
10.	Chwail Kim	Reliability-Based Topology Optimization	2006-07
11.	Liu Du	Reliability- and Possibility-Based Design Optimization	2007-08
12.	Ikjin Lee	System Reliability-Based Design Optimization under Input and Model Uncertainties	2008-11
13.	Hyunkyoo Cho	Confidence-Based Reliability Analysis and Multidisciplinary Design Optimization	2014-17
14.	Min-yeong Moon	Confidence-Based Uncertainty Quantification & Reliability Assessment and Reliability-Based Design Optimization	2017-19

COURSES TAUGHT

1. Undergraduate Courses: 57:7 Statics
   57:10 Dynamics
   57:21 Principle of Design I
   58:52 Mechanical Systems
2. Graduate Courses: 58:113 Mathematical Methods in Engineering

58:214 Analytical Methods in Mechanical Systems
58:155 Intermediate Dynamics
58:254 Energy Principle in Structural Mechanics
58/259 Mechanical Design in Structures

CONSULTING

1. Army Mechanics and Materials Research Center, Watertown, MA, 1985.
2. Regular consultant to General Motors Research Laboratories, Engineering Mechanics Department, 1987 - 1988.
3. Instituto Superior Technico, Lisboa, Portugal, December 1987 (under NATO-AGARD sponsorship)

PROPOSAL REVIEWER (Reviewed 50 Proposals)

1. National Science Foundation
2. Served as a proposal review panel member for National Science Foundation Multidisciplinary Research: National Challenge
3. Served as a proposal review panel member for National Science Foundation Design and Engineering Program unsolicited proposal review
4. Served as a proposal review panel member for National Science Foundation Design, Manufacture, and Industrial Innovation (DMI) unsolicited proposal review
5. NSF Unsolicited Proposals
6. Army Research Office, U.S. Army Laboratory Command

PAPER REVIEWER - Reviewed a total of 501 papers (363 Journal Papers and 138 Conference Papers)

1. Journal of Optimization Theory and Application
2. Journal of Structural Mechanics
3. Optimal Control Applications and Methods
4. ASME J. of Mechanisms, Transmission, and Automation in Design
5. AIAA Journal
6. AIAA Multidisciplinary Analysis and Optimization Conference

7. ASME Design Automation Conference
8. ASME J. of Vibration, Acoustics, Stress and Reliability in Design
9. ASME J. of Applied Mechanics
10. SIAM Journal on Control and Optimization
11. Mechanics of Structures and Machines
12. Mechanics Based Design of Structures and Machines
13. Engineering with Computers
14. International Journal for Numerical Methods in Engineering
15. Computer Methods in Applied Mechanics and Engineering
16. Finite Elements in Analysis and Design
17. ASME Applied Mechanics Reviews
18. NASA Symposium on Multidisciplinary Analysis and Optimization
19. Structural and Multidisciplinary Optimization
20. ASME Journal of Mechanical Design
21. International Journal of Solids and Structures
22. ASCE Journal of Structural Engineering
23. Structural Optimization 93, World Congress on Optimal Design of Structural Systems
24. Computing Systems in Engineering
25. Composite Engineering
26. Journal of the Franklin Institute
27. ASME Design Theory and Methodology
28. ASME Journal of Offshore Mechanics and Arctic Engineering
29. Structural Engineering and Mechanics
30. ASME Journal of Vibration and Acoustics
31. ASCE Journal of Engineering Mechanics
32. Computational Mechanics
33. Computers & Structures

34. Computer-Aided Civil and Infrastructure Engineering
35. Research in Engineering Design
36. Optimization and Engineering
37. Engineering Computations
38. ASME Journal of Pressure Vessel Technology
39. ASME Journal of Computing and Information Science in Engineering (JCISE)
40. International Congress of Theoretical and Applied Mechanics (ICTAM)
41. Society of Automotive Engineering World Congress Conference
42. ASME Journal of Computational and Nonlinear Dynamics
43. The Open Acoustic Journal
44. Engineering Optimization
45. International Journal of Reliability and Safety (IJRS)
46. Fatigue and Fracture of Engineering Materials and Structures (FFEMS)
47. Journal of Precision Engineering and Manufacturing (JPEM)
48. Journal of Defense Modeling and Simulation
49. Smart Structures and Systems
50. Proceeding of IMechE, Part D: Journal of Automobile Engineering
51. ASME Journal of Verification, Validation and Uncertainty Quantification

BOOK REVIEWER

1. Structural Optimization Under Stability and Vibration Constraints by Michal Zyczkowski for ASME Applied Mechanics Reviews, 1990.

INVITED PRESENTATIONS

1. Invited as a lecturer, NATO Advanced Study Institute, Optimization of Distributed Parameter Structures, Iowa City, Iowa, May 21-June 4, 1980.
2. Invited to present a paper in the symposium on Recent Experiences in Multidisciplinary Analysis and Optimization, NASA Langley Research Center, Hampton, VA, April 24-26, 1984.

3. Invited to present a paper in Society of Engineering Science, Inc., Conference at VPI and State University, October 15-17, 1984.

4. Invited to present a paper in the GM Symposium, The Optimum Shape: Automated Structural Design, Warren, MI, September 30-October 1, 1985.

5. Invited as a keynote speaker, Workshop on Numerical Methods in Optimal Design, Universite de Montreal, Montreal, Quebec, Canada, January 28-31, 1986.

6. Invited as a main lecturer, NATO Advanced Study Institute, Computer Aided Optimal Design: Structural and Mechanical Systems, Troia, Portugal, June 29-July 11, 1986.

7. Invited to present a paper at the First World Congress on Computational Mechanics, The University of Texas at Austin, September 22-26, 1986.

8. Invited to present a paper in the NASA Symposium, Sensitivity Analysis in Engineering, NASA Langley Research Center, Hampton, VA, September 25-26, 1986.

9. Invited to present a paper at the SAE Earthmoving Industry Conference, Peoria, IL, April 12-14, 1988.

10. Invited to present a paper in the Second NASA/Air Force Symposium on Recent Experiences in Multidisciplinary Analysis and Optimization, NASA Langley Research Center, Hampton, VA, September 28-30, 1988.

11. Invited as a keynote lecturer, GAMM-Seminar, Discretization Methods and Structural Optimization-Procedures and Applications, University of Siegen, FRG, October 5-7, 1988.

12. Invited to present a paper at the AFOSR Workshop on Shape Optimization, UC Berkeley, CA, May 22-24, 1989.

13. Invited as a speaker at The Korean Federation of Science and Technology Societies Workshop on CAD/CAM and CIM, Seoul, Korea, October 11-16, 1989.

14. Invited to give a seminar on Optimum Structural Design, Department of Civil Engineering, Mechanics, and Metallurgy, The University of Illinois at Chicago, Chicago, IL, November 1, 1989.

15. Invited to give a seminar on Design Sensitivity Analysis and Optimization of Structural Systems, Department of Mechanical Engineering and Mechanics, Old Dominion University, Norfolk, VA, October 19, 1990.

16. Invited to give a seminar on Overview-Design Optimization of Mechanical Systems, John Deere Annual FEA/MCAE User Group Seminar, Ottumwa, IA, November 8, 1990.

17. Invited to give a seminar on Overview-Design Optimization of Mechanical Systems, Mississippi Valley Section SAE and Quad City Section ASAE Joint Winter Meeting, Moline IL, January 24, 1991.

18. Invited as a main lecturer, NATO/DFG Advanced Study Institute, Optimization of Large Structural Systems, Berchtesgaden, Germany, September 23-October 4, 1991.

19. Invited to give a seminar on Design Sensitivity Analysis and Optimization of Structural Systems, Department of Mechanical and Industrial Engineering, The University of Illinois at Urbana, Urbana, IL, March 25, 1992.

20. Invited as a main lecturer, NATO-ARMY-NASA Advanced Study Institute, Concurrent Engineering Tools and Technologies for Mechanical System Design, Iowa City, IA, May 25-June 5, 1992.

21. Invited as a speaker at The Korean Federation of Science and Technology Societies Workshop on Automation and Mechatronics, Seoul, Korea, October 12-14, 1992.

22. Invited to present a paper at the AUTOFACT '92, Cobo Center, Detroit, MI, November 8-12, 1992.

23. Invited as a Plenary Session Speaker at Structural Optimization 93, The World Congress on Optimal Design of Structural Systems, Rio de Janeiro, Brazil, August 2-6, 1993.

24. Invited to present a Case Study "Noise, Vibration, and Harshness Optimization of Auto Body Structure," at the 1994 NSF Design and Manufacturing Systems Grantees Conference, MIT, Boston, January 5-7, 1994.

25. Invited to give seminars and lectures on Simulation-Based Concurrent Engineering Tools and Infrastructure and Design Sensitivity Analysis and Optimization of Structural Systems, Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology, October 26-27, 1994.

26. Invited to present a seminar and serve as a panel member of a session at the Automotive Research Center Conference, University of Michigan, Ann Arbor, MI, April 19-20, 1995.

27. Invited to present a seminar at The Best of German/American Automotive Technology Conference sponsored by Fraunhofer USA and University of Michigan, Southfield, MI, June 27-28, 1995.

28. Invited as a Panelist to the Panel Session at The Best of German/American Automotive Technology Conference sponsored by Fraunhofer USA and University of Michigan, Southfield, MI, June 27-28, 1995.

29. Invited to present a seminar at Samsung Advanced Institute of Technology, Suwon, Korea, January 22, 1996.

30. Invited to present a seminar at Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology, Taejeon, Korea, January 24, 1996.

31. Invited to present a seminar at Samsung Heavy Industries, Co., LTD, Changwon, Korea, January 25, 1996.

32. Invited to present a seminar at Department of Mechatronics, Gwangju Institute of Science and Technology, Gwangju, Korea, August 5, 1996

33. Invited to present a seminar at Departments of Civil Engineering and Mechanical Engineering, Chonbuk National University, Chonju, Korea, August 7, 1996

34. Invited to present a seminar at Department of Mechanical Engineering, Hanyang University, Seoul, Korea, December 13, 1996

35. Invited as Featured Speaker at the Engineers Week Banquet of the Muscatine Chapter of the Iowa Engineering Society, Muscatine, Iowa, February 19, 1997.

36. Invited to present two seminars at Ford Motor Company Research Lab., Dearborn, MI, June 5, 1997.

37. Invited to present seminars at Tokyo Denki University, Tokyo, Japan, July 31, 1997.

38. Invited to present a series of seminars at Gwangju Institute of Science and Technology, Gwangju, Korea, August 4-5, 1997.

39. Invited to present two seminars at ICASE/NASA Langley, June 17-18, 1998.

40. Invited to present a seminar at Center for Computational Sciences at University of Kentucky, September 30, 1998.

41. Invited to present a seminar at the Annual Joint ASME Meeting of University of Iowa and Cedar Rapids Membership, Iowa City, IA, February 25, 1999.

42. Invited to present a series of lectures at the Graduate School of Automotive Engineering, Kookmin University, Seoul, Korea, June 16, 2000.

43. Invited to present a series of lectures at Gwangju Institute of Science and Technology, Sponsored by K-JIST and iDOT, Gwangju, Korea, June 19-21, 2000.

44. Invited to present a series of seminars at Korea Advanced Institute of Science and Technology (KAIST), Taejon, Korea, June 22, 2000.

45. Invited to present a series of seminars at Yonsei University, Seoul, Korea, June 23, 2000.

46. Invited to give a seminar on Structural Shape Optimization Using Meshfree Method, Department of Mechanical Engineering, The University of Illinois at Chicago, Chicago, IL, April 13, 2001.

47. Invited to present a Keynote Address at Senior Design Day, Biomedical Engineering, University of Iowa, April 28, 2001.

48. Invited to present a seminar at Samsung Advanced Institute of Technology, Suwon, Korea, May 30, 2001.

49. Invited to present lectures in Advanced Design Optimization Lecture Series at Hanyang University, Seoul, Korea, June 13, 2001.

50. Invited to present a seminar at Sungkyunkwan University, Suwon, Korea, June 14, 2001.

51. Invited as a Keynote Speaker, Symposium on Probabilistic Mechanics at 6th U.S. National Congress on Computational Mechanics, Dearborn, MI, August 1-4, 2001.

52. Invited to present two days seminars at ICASE Series on Risk-Based Design at ICASE/NASA Langley, December 10-11, 2001.

53. Invited to present a seminar "Design Sensitivity Analysis and Optimization Using Meshfree Method," at Caterpillar Technical Center, Peoria, June 17, 2002.

54. Invited as a Plenary Session Speaker at 2nd China-Japan-Korea Joint Symposium on Optimization of Structural and Mechanical System, Busan, Korea, November 4-8, 2002.

55. Invited to present lectures in "Advances in Reliability-Based Design Optimization and Probability Analysis" at Seoul National University, Seoul, Korea, November 7, 2002.

56. Iowa Distinguished Faculty in Engineering Lecture, "Design Sensitivity Analysis, Optimal Design, and Reliability of Mechanical Systems," College of Engineering, Iowa City, IA, September 18, 2003.

57. Invited to present Iowa Distinguished Faculty in Engineering Lecture at Iowa State University, "Design Sensitivity Analysis, Optimal Design, and Reliability of Mechanical Systems," Ames, IA, February 19, 2004.

58. Invited to present a seminar "Performance Measure Approach for Reliability-Based Design Optimization," Department of Aerospace Engineering, Iowa State University, Ames, IA, February 19, 2004.

59. Invited to present two seminars, "Durability and Reliability-Based Design Optimization" and "NVH Design Sensitivity Analysis and Optimization Using Energy Finite Element Method," at the LMS Conference on Physical and Virtual Prototyping at Troy, MI, March 30-31, 2004.

60. Invited to present two seminars, "Design Sensitivity Analysis and Optimization of High Frequency Radiation Problems Using Energy Finite Element Method and Energy Boundary Element Method" and "Reliability- and Possibility-Based Design Optimizations Using Performance Measure Approach," at National Laboratory for Scientific Computing-LNCC, January 28, 2005, Petropolis, Brazil.

61. Invited to present a Keynote Paper "Integration of Reliability- and Possibility-Based Design Optimizations Using Performance Measure Approach," at 2005 SAE World Congress, April 11-14, 2005, Detroit, MI.

62. Invited as a Panelist to the Panel Session, M33: "Transition of Reliability Methods from Research to Engineering Design," 2005 SAE World Congress, April 12, 2005, Detroit, Michigan.

63. Invited as a Panelist to the Panel Session "Probabilistic Methods and Reliability" at the WCSMO6, Rio de Janeiro, Brazil, May 30 – June 3, 2005.

64. Invited to present a seminar, "Continuum-Based Design Sensitivity Analysis and Optimization of Springback in Stamping Process," Department of Mechanical and Aerospace Engineering, University of Missouri, Rolla, MO, September 22, 2005.

65. Invited to present a seminar, "Continuum-Based Design Sensitivity Analysis and Optimization of Springback in Stamping Process," Mechanical Engineering-Engineering Mechanics, Michigan Technological University, Houghton, MI, November 3, 2005.

66. Invited to present a seminar, "An Inverse Analysis Method for Design Optimization with Both Statistical and Fuzzy Uncertainties," at the LMS Conference on Physical and Virtual Prototyping at Troy, MI, April 4, 2006.

67. Invited to present a seminar, "A Design Optimization Formulation for Problems with Random and Fuzzy Input Variables Using Performance Measure Approach," at iDOT, College of Engineering, Hanyang University, Seoul, Korea, January 31, 2007.

68. Invited to present a seminar "Reliability and Possibility-Based Analyses and Design Optimization," at Caterpillar, Peoria, IL, April 23, 2007.

69. Invited to present a BK 21 Series of Lectures on "Design Optimizations Under Uncertainty" at Hanyang University, Seoul, Korea, May 28-29, 2007.

70. Invited to present a seminar at the Endowed Lecture Series at Department of Mechanical and Aerospace Engineering, University of Florida, October 16, 2007.

71. Invited to present a World Class University Lecture Series on "System Reliability-Based Design Optimization with Associated Confidence Levels under Input and Model Uncertainties," at Seoul National University, Seoul, Korea, March 16-17, 2009.

72. Invited to present a lecture series on "System Reliability-Based Design Optimization with Associated Confidence Levels under Input and Model Uncertainties," at Gwangju Institute of Technology, Gwangju, Korea, March 18-19, 2009.

73. Invited to present a seminar "Reliability-Based Design Optimization with Associated Confidence Levels under Input Model Uncertainties for Ground Vehicle Weight Reduction," at Korea Agency for Defense Development (ADD), Taejon, Korea, July 30, 2009.

74. Invited to present a seminar "System Reliability-Based Design Optimization with Associated Confidence Levels under Input and Simulation Model Uncertainties," at the Naval Architecture and Ocean Engineering Department, Seoul National University, Seoul, Korea, May 21, 2009.

75. Invited to present a seminar "System Reliability-Based Design Optimization with Associated Confidence Levels under Input and Simulation Model Uncertainties," at the Korea Electrical Engineering & Science Research Institute (KEESRI), Seoul National University, Seoul, Korea, August 5, 2009.

76. Invited to present a seminar "Developments of Reliability-Based Design Optimization with Confidence Levels under Input & Simulation Model Uncertainties," at Korea Agency for Defense Development (ADD), Taejon, Korea, November 18, 2009.

77. Invited to present a seminar "Developments of Reliability-Based Design Optimization with Confidence Levels under Input Model Uncertainty" at the ASTM E08.04 Workshop, St. Louise, MO, May 19, 2010.

78. Invited to present a World Class University Distinguished Lecture "Are Deterministic Engineering Optimum Designs Reliable?" at Seoul National University, June 16, 2010.

79. Invited to present a seminar "Overview of Reliability-Based Design Optimization & Future Developments for Broader Applications" at the Graduate School for Wind Energy at POSTECH, Korea, October 13, 2010.

80. Invited to present three lectures on "Overview of Reliability-Based Design Optimization & Future Developments for Broader Applications", "A Metamodeling Method Using Dynamic Kriging and Sequential Sampling" and "Sampling-Based RBDO Using the Dynamic Kriging (D-Kriging) Method and Stochastic Sensitivity Analysis" at the State Key Laboratory of Structural Analysis for Industrial Equipment, Dalian University of Technology, China, October 23, 2010.

81. Invited to present a seminar "Overview of Reliability-Based Design Optimization & Future Developments for Broader Applications" at the at the Vehicle Engineering Department and Mechanical Engineering Department at the National Taipei University of Technology, Taiwan, November 1, 2010.

82. Invited to present a seminar "Overview of Reliability-Based Design Optimization & Future Developments for Broader Applications" at the Mechanical Engineering Department at the National Cheng Kung University, Taiwan, November 2, 2010.

83. Invited to present a seminar "Overview of Reliability-Based Design Optimization & Future Developments for Broader Applications" at the School of Mechanical Engineering at Sungkyunkwan University, Korea, November 5, 2010.

84. Invited to present a seminar "Overview of Reliability-Based Design Optimization & Future Developments for Broader Applications" at Hyundai Motor Company, Namyang Technology Research Center, November 24, 2010.

85. Invited to present three lectures on “Recent Advances in Reliability-Based Design Optimization & Future Developments for Broader Applications” at Gwangju Institute of Science & Technology (GIST), July 22, 2011.

86. Invited to present a seminar “ARC Tech Transfer Iowa Reliability-Based Design Optimization (I-RBDO) Code and Its Applications” at School of Mechanical and Aerospace Engineering, Seoul National University, May 30, 2012.

87. Invited to present a seminar “Wind Energy Research at Iowa” at Department of Naval Architecture and Ocean Engineering, Seoul National University, August 6, 2012.

88. Invited to present a seminar “Iowa Reliability-Based Design Optimization (I-RBDO) Code & Applications” at the Graduate School of Engineering Mastership at POSTECH, Korea, July 12, 2013.

89. Invited to present a seminar “Iowa Reliability-Based Design Optimization (I-RBDO) Code & Applications” at Hyundai Motors, August 7, 2013.

90. Invited to present a Keynote Paper “Development of Reliability Analysis and Multidisciplinary Design Optimization (RAMDO) & Its Applications,” at 2014 SAE World Congress, April 8-10, 2014, Detroit, MI.

91. Invited to give a seminar “Development of Reliability Analysis and Multidisciplinary Design Optimization (RAMDO),” at Hyundai Motor Company, Seoul, Korea, January 14, 2016.

92. Invited to give a seminar “Development of Reliability Analysis and Multidisciplinary Design Optimization (RAMDO),” at Hanyang University, Seoul, Korea, January 15, 2016.

93. Invited to give a seminar “Development of Reliability Analysis and Multidisciplinary Design Optimization (RAMDO),” at the Seoul National University, Seoul, Korea, January 18, 2016.

94. Invited to present a Keynote seminar “Development of Reliability Analysis and Multidisciplinary Design Optimization (RAMDO),” at Automotive Testing Expo 2016, KINTEX, Seoul, Korea, January 19-21, 2016.

95. Invited to give a seminar at the Kececioglu Lecture at Aerospace and Mechanical Engineering, The University of Arizona, Tucson, AZ, March 30, 2017.

96. Invited to presented a seminar “Can We Use Validated Simulation Model Instead of a Large Number of Physical Tests for Confidence-Based Reliability Assessment?” at the SAE FD&E Committee Meeting, April 25, 2017, John Deere, Moline, IL.

97. Invited to present a seminar “Developments of Reliability Analysis and Multidisciplinary Design Optimization (RAMDO),” at the Machine-Ground Interaction Consortium (MaGIC)-University of Wisconsin, November 14, 2017, Madison, WI.

SEMINAR PRESENTATIONS

1. Presented a seminar at Department of Mechanical Engineering, Seoul National University, Seoul, Korea, August 8, 1984.

2. Presented a seminar at Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology, Seoul, Korea, August 10, 1984.

3. Presented a seminar at Scientific Research Lab., Ford Motor Company, Dearborn, MI, August 17, 1987.

4. Presented a seminar at Department of Mechanical Engineering, Seoul National University, Seoul, Korea, August 2, 1988.

5. Presented a seminar at Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology, Seoul, Korea, August 10, 1988.

6. Presented a seminar at Department of Mechanical Engineering, Pohang Institute of Science and Technology, Seoul, Korea, August 12, 1988.

7. Presented a seminar at Department of Mechanical Engineering, Yonsei University, Seoul, Korea, August 14, 1988.

8. Presented a seminar at Scientific Research Lab., Ford Motor Company, Dearborn, MI, June 2, 1989.

9. Presented a seminar at Department of Mechanical Engineering, Seoul National University, Seoul, Korea, October 14, 1989.

10. Presented a seminar at Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology, Seoul, Korea, October 16, 1989.

11. Presented a seminar at Department of Mechanical Engineering, Pohang Institute of Science and Technology, Seoul, Korea, October 17, 1989.

12. Presented a seminar at Research and Development Department, Hyundai Motor Company Ulsan, Korea, October 17, 1989.

13. Presented a seminar at Korea Institute of Machinery and Metals, Changwon, Korea, October 18, 1989.

14. Presented a seminar at Department of Mechanical Engineering, Yonsei University, Seoul, Korea, October 19, 1989.

15. Presented a seminar at Department of Mechanical Engineering, Iowa State University, Ames, Iowa, December 4, 1991.

16. Presented a seminar at PATRAN Software Products Division of PDA Engineering, Costa Mesa, California, June 12, 1992.

17. Presented a seminar at GenCorp Research, Akron, Ohio, June 16, 1992.

18. Presented a seminar at KIA Motors, Seoul, Korea, October 8, 1992.

19. Presented a seminar at Departments of Civil Engineering and Mechanical Engineering, Chonbuk National University, Chonju, Korea, October 9, 1992.

20. Presented a seminar "Simulation-Based Concurrent Engineering Tools and Infrastructure," at the ARC Conference at Ann Arbor, MI, April 19-20, 1995.

21. Presented a seminar "Simulation-Based Concurrent Engineering Tools and Infrastructure," at the Best of German/American Automotive Technology Conference, Detroit, MI, June 27-28, 1995.

22. Presented a seminar "Design Sensitivity Analysis of Nonlinear Structures," at the ARC Conference, Ann Arbor, MI, May 29-30, 1996.

23. Presented a Plenary "Case Study III: Multi-Purpose Vehicles/HMMWV," at the ARC Conference, Ann Arbor, MI, June 3-4, 1997.

24. Presented a seminar "Shape Design Sensitivity Analysis and Optimization Using Meshless Method," at the ARC Conference, Ann Arbor, MI, June 3-4, 1997.

25. Presented a seminar "Design Sensitivity Analysis of Transient Elasto-Plastic Nonlinear Structures Using DYNA-3D," at the ARC Conference, Ann Arbor, MI, June 3-4, 1997.

26. Presented a seminar "Reliability-Based Design Optimization for Fatigue Life," at the ARC Conference, Ann Arbor, MI, June 3-4, 1997.

27. Presented a seminar "Integrated Simulation-Based Design Environment," at the ARC Conference, Ann Arbor, MI, June 3-4, 1997.

28. Presented a seminar at an Iowa Engineering Society Herbert Hoover Chapter Meeting, Iowa City, IA, September 23, 1997.

29. Presented a seminar at the Sunrise Optimist Club, Iowa City, IA, October 21, 1997.

30. Presented a seminar "CAD-Based Design Process for Fatigue Analysis, Reliability-Analysis, and Design Optimization," at the SAE FD&E committee meeting at Kansas State U., Manhattan, Kansas, March 31, 1998.

31. Presented a seminar "Shape Design Sensitivity Analysis of Hyperelastic Material Contact Problem with Friction," at the ARC Conference, Ann Arbor, MI, May 19-20, 1998.

32. Presented a seminar “CAD-Based Design Process for Fatigue Analysis, Reliability Analysis, and Design Optimization,” at the ARC Conference, Ann Arbor, MI, May 19-20, 1998.

33. Presented a seminar “A New Study on Reliability-Based Design Optimization for Fatigue Life,” at the ARC Conference, Ann Arbor, MI, May 25-26, 1999.

34. Presented a seminar “Reliability-Based Design Optimization of Fatigue Life,” at the ARC Conference, Ann Arbor, MI, May 23-24, 2000.

35. Presented a seminar “Reliability-Based Design Optimization Using Moving Least Squares Method,” at the ARC Conference, Ann Arbor, MI, May 15-16, 2001.

36. Presented a seminar “Design Sensitivity Analysis & Optimization of NVH Problem,” at the ARC Collaborative Research Seminar, October 15, 2001.

37. Presented a Plenary “Case Study: Prediction And Design Strategies to Achieve Light Weight, Reduced NVH, and Improved Durability for Next-Generation Vehicles,” at the ARC Conference, Ann Arbor, MI, May 14-15, 2002.

38. Presented a seminar “Design Optimization of Complex Vehicle Structures for Minimum Weight,” at the ARC Conference, Ann Arbor, MI, May 14-15, 2002.

39. Presented a seminar “Integrated Design Process for Manufacturing and Multidisciplinary Design under System Uncertainty,” at the ARC Conference, Ann Arbor, MI, May 14-15, 2002.

40. Presented a seminar "Reliability-Based Design Optimization of Mechanical Systems" at the ARC Collaborative Research Seminar, March 10, 2003.

41. Presented a seminar “Development of Modeling and Simulation Processes for Durability Analysis, Validation & Design Optimization” at the SAE FD&E committee meeting at Caterpillar, Peoria, IL, April 15, 2003.

42. Presented a Plenary “Case Study: New Capabilities in Structural Simulation, Analysis and Design: Tools and Applications,” at the ARC Conference, Ann Arbor, MI, May 12-13, 2003.

43. Presented a seminar “Integrated RBDO Process of Structural Durability Under Manufacturing Variability,” at the ARC Conference, Ann Arbor, MI, May 12-13, 2003.

44. Presented a seminar “Uncertainty, Reliability, and Design Optimization of Mechanical Systems,” at the National Automotive Center Workshop on Stochastics and Design Optimization, Ann Arbor, MI, June 13, 2003.

45. Presented a Plenary “Case Study: Stryker Mechanical Physics of Failure (PoF) Project,” at the ARC Conference, Ann Arbor, MI, May 18-19, 2004.

46. Presented a seminar “Reliability- and Possibility-Based Design Optimizations Using Performance Measure Approach,” at the ARC Collaborative Research Seminar Series, Ann Arbor, MI, January 12, 2005.

47. Presented a seminar “Alternative Methods for Reliability-Based Robust Design Optimization Including Dimension Reduction Methods,” at the ARC Collaborative Research Seminar Series, Ann Arbor, MI, February 23, 2006.

48. Presented a Plenary “Case Study: Structures and Materials for Lighter, Safer, and More Reliable Vehicles,” at the ARC Conference, Ann Arbor, MI, May 23-24, 2006.

49. Presented two seminars “Reliability Based Design Optimization with Dependent Input Variables Using Copulas” and “Dimension Reduction Method (DRM) Based RBDO for Highly Nonlinear Systems,” at the ARC Collaborative Research Seminar Series, Ann Arbor, MI, April 25, 2007.

50. Presented a Plenary “Case Study: Reliability Analysis and Design Optimization of Military Ground Vehicles Using TARDEC High Performance Computing,” at the ARC Conference, Ann Arbor, MI, May 15-16, 2007.

51. Presented a Plenary “Case Study: Reliability-Based Design Optimization with Associated Confidence Levels under Input Model Uncertainties for Ground Vehicle Weight Reduction,” at the ARC Conference, Ann Arbor, MI, May 12-13, 2009.

52. Presented a Plenary “Case Study: Parallelized Reliability-Based Design Optimization Process for Broader Applications,” at the ARC Conference, Ann Arbor, MI, May 10-11, 2010.

53. Presented an ARC @ TARDEC Seminar “Overview of Reliability-Based Design Optimization & Future Developments for Broader Applications,” TARDEC, Warren, MI, July 8, 2010.

54. Presented two ARC Seminars “I-RBDO Code for Reliability Analysis & Reliability-Based Design Optimization,” and “Adaptive Virtual Support Vector Machine for Reliability Analysis of High-Dimensional Problems,” Univ. of Michigan, Ann Arbor, MI, November 4, 2011.

55. Presented a Plenary “Case Study: New Capabilities in Structural Simulation, Analysis and Design: Tools and Applications,” at the ARC Conference, Ann Arbor, MI, May 12-13, 2012.

56. Presented a seminar “Can We Use Validated Simulation Model Instead of a Large Number of Physical Tests for Confidence-Based Reliability Assessment?” at the SAE FD&E committee meeting at John Deere, Moline, IL, April 25, 2017.

PUBLICATIONS

Books and monographs

1. Haug, E.J., Choi, K.K., and Komkov, V., Design Sensitivity Analysis of Structural Systems, Academic Press, New York, NY, 1986; also translated to the Russian by N. V. Banichuk and published in the USSR, 1988.

2. Choi, K. K. and Haug, E. J., Edited "Special Issue on Shape Optimization," Mechanics of Structures and Machines, Vol. 20, No. 4, 1992 and Vol. 21, No. 1, 1993.

3. Haug, E. J. and Choi, K. K., Methods of Engineering Mathematics, Prentice Hall Inc., Englewood Cliffs, NJ, 1993.

4. Choi, K. K. and Kim, N. H., Structural Sensitivity Analysis and Optimization: Volume 1, Linear Systems & Volume 2, Nonlinear Systems and Applications, Springer, New York, NY, 2005.

5. Mota Soares, C.A., Bendsoe, M., Choi, K.K. and Herskovits, J., Edited Special Issue Structural Optimization, International Journal of Computer and Structures, Elsevier, New York, NY, 2008.

Papers Submitted to and Accepted for Publication or Published in Technical Journals with Rigorous Review Procedures

1. Haug, E.J. and Choi, K.K., "Systematic Occurrence of Repeated Eigenvalues in Structural Optimization," JOTA, Vol. 38, No. 2, 1982, pp. 251-274.

2. Choi, K.K., Haug, E.J., and Lam, H.L., "A Numerical Method for Distributed Parameter Structural Optimization Problems with Repeated Eigenvalues," J. of Structural Mechanics, Vol. 10, No. 2, 1982, pp. 191-207.

3. Choi, K.K., Haug, E.J., and Seong, H.G., "An Iterative Method for Finite Dimensional Structural Optimization Problems with Repeated Eigenvalues," Int. J. for Numerical Methods in Engineering, Vol. 19, 1983, pp. 93-112.

4. Choi, K.K., Haug, E.J., Hou, J.W., and Sohoni, V.N., "Pshenichny's Linearization Method for Mechanical System Optimization," ASME Journal of Mechanisms, Transmissions, and Automation in Design, Vol. 105, No. 1, 1983, pp. 97-103.

5. Lam, H.L., Choi, K.K., and Haug, E.J., "A Sparse Matrix Finite Element Technique for Iterative Structural Optimization," Computers and Structures, Vol. 16, No. 1-4, 1983, pp. 289-295.

6. Choi, K.K. and Haug, E.J., "Shape Design Sensitivity Analysis of Elastic Structures," J. of Structural Mechanics, Vol. 11, No. 2, 1983, pp. 231-269.

7. Yoo, Y.M., Haug, E.J., and Choi, K.K., "Shape Optimal Design of an Engine Connecting Rod," ASME Journal of Mechanisms, Transmissions, and Automation in Design, Vol. 106, No. 3, 1984, pp. 415-419.

8. Haug, E.J. and Choi, K.K., "Structural Design Sensitivity Analysis with Generalized Global Stiffness and Mass Matrices," AIAA Journal, Vol. 22, No. 9, 1984, pp. 1299-1303.

9. Yang, R.J., Choi, K.K., Crowninshield, R.D., and Brand, R.A., "Design Sensitivity Analysis: A New Method for Implant Design and a Comparison with Parametric Finite Element Analysis," J. of Biomechanics, Vol. 17, No. 11, 1984, pp. 849-854.

10. Mota Soares, C.A., Rodrigues, H.C., and Choi, K.K., "Shape Optimal Structural Design Using Boundary Element and Minimum Compliance Techniques," ASME Journal of Mechanisms, Transmissions, and Automation in Design, Vol. 106, No. 4, 1984, pp. 516-521.

11. Yang, R.J., Choi, K.K., and Haug, E.J., "Numerical Considerations in Structural Component Shape Optimization," ASME Journal of Mechanisms, Transmissions, and Automation in Design, Vol. 107, No. 3, 1985, pp. 334-339.

12. Yang, R.J. and Choi, K.K., "Accuracy of Finite Element Based Design Sensitivity Analysis," J. of Structural Mechanics, Vol. 13, No. 2, 1985, pp. 223-239.

13. Choi, K.K., "Shape Design Sensitivity Analysis of Displacement and Stress Constraints," J. of Structural Mechanics, Vol. 13, No. 1, 1985, pp. 27-41.

14. Choi, K.K. and Seong, H.G., "A Domain Method for Shape Design Sensitivity Analysis of Built-Up Structures," Computer Methods in Applied Mechanics and Engineering, Vol. 57, No. 1, 1986, pp. 1-15.

15. Choi, K.K. and Seong, H.G., "Design Component Method for Sensitivity Analysis of Built-Up Structures," J. of Structural Mechanics, Vol. 14, No. 3, 1986, pp. 379-399.

16. Choi, K.K., Santos, J.L.T., and Frederick, M.C., "Implementation of Design Sensitivity Analysis with Existing Finite Element Codes," ASME Journal of Mechanisms, Transmissions, and Automation in Design, Vol. 109, No. 3, 1987, pp. 385-391; also presented at the 11th ASME Design Automation Conference, September 1985, Paper No. 85-DET-70.

17. Seong, H.G. and Choi, K.K., "Boundary Layer Approach To Shape Design Sensitivity Analysis," Mechanics of Structures and Machines, Vol. 15, No. 2, 1987, pp. 241-263.

18. Dopker, B. and Choi, K.K., "Sizing and Shape Design Sensitivity Analysis Using a Hybrid Finite Element Code," Finite Elements in Analysis and Design, Vol. 3, 1987, pp. 315-331.

19. Choi, K.K. and Santos, J.L.T., "Design Sensitivity Analysis of Nonlinear Structural Systems. Part I: Theory," Int. J. for Numerical Methods in Engineering, Vol. 24, No. 11, 1987, pp. 2039-2055.

20. Dopker, B. and Choi, K.K., "A Study of Solution Algorithms for Shape Design Sensitivity Analysis on a Supermini Computer with an Attached Array Processor," Engineering with Computers, Vol. 3, 1987, pp. 111-119.

21. Dopker, B., Choi, K.K., and Benedict, R.L., "Shape Design Sensitivity Analysis of Structures Containing Arches," Computers and Structures, Vol. 28, No. 1, 1988, pp. 1-13.

22. Santos, J.L.T. and Choi, K.K., "Sizing Design Sensitivity Analysis of Nonlinear Structural Systems. Part II: Numerical Method," Int. J. for Numerical Methods in Engineering, Vol. 26, No. 9, 1988, pp. 2097-2114.

23. Choi, K.K., Santos, J.L.T., and Yao, T.M., "Recent Advances in Design Sensitivity Analysis and Its Use in Structural Design Process," SAE Transactions, Vol. 96, 1988; also presented at 39th Annual Earth Moving Industry Conference, SAE Paper No. 880783, 1988.

24. Yao, T.M. and Choi, K.K., "Shape Optimal Design of An Arch Dam," ASCE Journal of Structural Engineering, Vol. 115, No. 9, 1989, pp. 2401-2405.

25. Yao, T.M. and Choi, K.K., "3-D Shape Optimal Design and Automatic Finite Element Regridding," Int. J. of Numerical Methods in Engineering, Vol. 28, No. 2, 1989, pp. 369-384.

26. Choi, K.K. and Twu, S-L, "On Equivalence of Continuum and Discrete Methods of Shape Design Sensitivity Analysis," AIAA Journal, Vol. 27, No. 10, 1989, pp.1418-1424.

27. Choi, J.H. and Choi, K.K., "Direct Differentiation Method for Shape Design Sensitivity Analysis Using Boundary Integral Formulation," Computers and Structures, Vol. 34, No. 3, 1990, pp. 499-508.

28. Park, J.S. and Choi, K.K., "Design Sensitivity Analysis of Critical Load Factor for Nonlinear Structural Systems," Computers and Structures, Vol. 36, No. 5, 1990, pp. 823-838.

29. Choi, K.K. and Park, J.S., "Optimal Design of Nonlinear Structural systems with Critical Loads," SAE Transactions-Journal of Passenger Cars, 1990; also in Emerging Technologies in Vehicle CAE and Structural Mechanics, SAE Paper No. 900830, 1990, pp. 131-143.

30. Wu, J.K., Choong, F.N., Choi, K.K., and Haug, E.J., "A Data Model for Simulation Based Concurrent Engineering of Mechanical Systems," International Journal of Systems Automation, Research & Applications, Vol. 1, 1991, pp. 67-87.

31. Choi, K.K. and Lee, J.H., "Sizing Design Sensitivity Analysis of Dynamic Frequency Response of Vibrating Structures," ASME Journal of Mechanical Design, Vol. 114, No. 1, 1992, pp. 166-173; also presented at the 15th ASME Design Automation Conference, September 1989.

32. Santos, J.L.T. and Choi, K.K., "Shape Design Sensitivity Analysis of Nonlinear Structural Systems," Structural Optimization, Vol. 4, No. 1, 1992, pp. 23-35.

33. Park, J.S. and Choi, K.K., "Design Sensitivity Analysis and Optimization of Nonlinear Structural Systems with Critical Loads," ASME Journal of Mechanical Design, Vol. 114, No. 2, 1992, pp. 305-312; also presented at the 16th ASME Design Automation Conference, September 1990.

34. Wang, S. and Choi, K.K., "Continuum Design Sensitivity Analysis of Transient Responses Using Ritz and Mode Acceleration Methods," AIAA Journal, Vol. 30, No. 4, 1992, pp. 1099-1109.

35. Twu, S.L. and Choi, K.K., "Configuration Design Sensitivity Analysis of Built-up Structures Part I: Theory," Int. J. of Numerical Methods in Engineering, Vol. 35, No. 5, 1992, pp. 1127-1150.

36. Chang, K.H. and Choi, K.K., "An Error Analysis and Mesh Adaptation Method for Shape Design of Elastic Solids," Computers and Structures, Vol. 44, No. 6, 1992, pp. 1275-1289.

37. Chang, K.H. and Choi, K.K., "A Geometry Based Parameterization Method for Shape Design of Elastic Solids," Mechanics of Structures and Machines, Vol. 20, No. 2, 1992, pp. 215-252.

38. Choi, K.K. and Twu, S.L., "An Extension of Material Derivative Method for Configuration Design Sensitivity Analysis," Mechanics of Structures and Machines, Vol. 20, No.4, 1992, pp. 459-497.

39. Choi, K.K., "Design Sensitivity Analysis of Nonlinear Structures-II," Structural Optimization: Status & Promise, AIAA Progress in Astronautics and Aeronautics, Vol. 150, Chapter 16, 1993, pp. 407-446.

40. Choi, K.K. and Chang, K.H, "Shape Design Sensitivity Analysis and Optimization of Elastic Solids," Structural Optimization: Status & Promise, AIAA Progress in Astronautics and Aeronautics, Vol. 150, Chapter 21, 1993, pp. 569-609.

41. Twu, S.L. and Choi, K.K., "Configuration Design Sensitivity Analysis of Built-up Structures Part II: Numerical Method," Int. J. of Numerical Methods in Engineering, Vol. 36, No. 24, 1993, pp. 4201-4222.

42. Chang, K.H. and Choi, K.K., "Shape Design Sensitivity Analysis and Optimization of Spatially Rotating Objects," Journal of Structural Optimization, Vol. 6, No. 4, 1993, pp. 216-226.

43. Wang, S. and Choi, K.K., "Continuum Sizing Design Sensitivity Analysis of Eigenvectors Using Ritz Vectors," Journal of Aircraft, Vol. 31, No. 2, 1994, pp. 457-459.

44. Choi, K.K. and Chang, K.H., "A Study of Design Velocity Field Computation for Shape Optimal Design," Finite Elements in Analysis and Design, Vol. 15, 1994, pp. 317-341.

45. Chen, C-J. and Choi, K.K., "A Continuum Approach for Second-order Shape Design Sensitivity Analysis of 3-D Elastic Solids," AIAA Journal, Vol. 32, No. 10, 1994, pp. 2099-2107.

46. Chen, C-J and Choi, K.K., "A Continuum Approach for Second-Order Shape Sensitivity Analysis of Elastic Solids With Loaded Boundary," Int. J. of Numerical Methods in Engineering, Vol. 38, No. 17, 1995, pp. 2979-3004.

47. Haug, E.J., Choi, K.K., Kuhl, J.G., and Wargo, J.D., "Virtual Prototyping Simulation for Design of Mechanical Systems," ASME Journal of Mechanical Design, Vol. 117 (B), 1995, pp. 63-70.

48. Chang, K.H., Choi, K.K., Tsai, T-S., Chen, C-J., Choi, B.S., Yu, X., "Design Sensitivity Analysis and Optimization Tool (DSO) for Shape Design Applications," Computing Systems in Engineering, Vol. 6, No. 2, 1995, pp. 151-175.

49. Park, Y.H. and Choi, K.K., “Design Sensitivity Analysis of Truss Structures with Elastoplastic Material,” Mechanics in Structures and Machines, Vol. 24, No. 2, 1996, pp. 189-216.

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