Krishnan Suresh
Philip and Jean Myers Chaired Professor
Dept. of Mechanical Engineering
University of Wisconsin, Madison
ksuresh@wisc.edu
Updated: Jan 2021

Summary of Research Interests

My primary research interests are topology optimization, additive manufacturing, neural-networks, computational mechanics, and high-performance computing.

Education

Cornell University	Mechanical Engineering	PhD, 1998
Cornell University	Mechanical Engineering	MS, 1995
University of California, Los Angeles	Manufacturing Engineering	MS, 1992
Indian Institute of Technology, Madras	Mechanical Engineering	B. Tech, 1990

Professional Appointments

June 17 – Present: Philip and Jean Myers Chaired Professor, Department of Mechanical Engineering, University of Wisconsin - Madison, USA.

Jan 16 – May 17: Professor, Department of Mechanical Engineering, University of Wisconsin - Madison, USA. Co-Director of the Wisconsin Applied Computing Center.

Jul 09 – Dec 15: Associate Professor, Department of Mechanical Engineering, University of Wisconsin - Madison, USA.

Jan 03 – Jun 09: Assistant Professor, Department of Mechanical Engineering, University of Wisconsin - Madison, USA.

Jan 02 – Dec 02: Engineering Manager, Mechatronics Group, Kulicke and Soffa Industries, Inc., Philadelphia, USA.

May 98 – Dec 01: Senior Mechanical Engineer, Microelectronics Group, Kulicke and Soffa Industries, Inc., Philadelphia, USA.

Visiting Positions

Sep 13 – Dec 13: Visiting Scientist, Air Force Research Lab, Dayton, OH

Jun 11 – Aug 11: Visiting Scientist, Office of Naval Research, Washington, DC

Sep 09 – May 10: Visiting Professor, Department of Mechanical Engineering, Indian Institute of Science, Bangalore, India.

Recent Honorary Awards

2018   James G. Woodburn Award for Excellence in Undergraduate Teaching

2017   Philip and Jean Myers Chaired Professorship

2017   Elected as an ASME Fellow

2015   LEED Scholar Engineering Professor (Teaching Award)

2014   ASME Innovative Design & Simulation Challenge Award (Faculty advisor), ASME IDETC/CIE

2013   Subject Matter Expert Award, Wright Patterson Air Force

2012   University Housing Honorary Lecturer Award

2012   Pi-Tau-Sigma Teaching Excellence Award Runner-up

2009   Best paper award, ASME IDETC/CIE Conference

2008   NSF CAREER Award

Books

1. Mirzendehdel, A. M., Suresh. K, "*A Hands-on Introduction to Topology Optimization*", Createspace publishers, ISBN 978-1976480607, available at Amazon, 2017.

2. Suresh K., "*Introduction to Design Optimization*", contract with Cambridge University Press (2019); pre-print available upon request.

Recent Book Chapters

1. Kumar, T., Subedi, S., Suresh, K., "Modern Design for Manufacturing", Invited Book Chapter, Encyclopedia of Materials: Metals and Alloys, 2020.

2. Rankouhi, B., Thoma, D., Suresh, K. "Support Structure Design for Selective Laser Melting Process," Invited Book Chapter, Recent Advanced in Additive Manufacturing, WSPC, 2019 (accepted)
3. Mirzendehdel, M. A., Suresh, K. "Efficient Multi-Material Topology Optimization", Invited Book Chapter, ASME ACIER Publications, 2019 (accepted).

Recent Journal Publications
1. Chandrasekhar, A., Suresh, K. "Length Scale Control in Topology Optimization using Fourier Enhanced Neural Networks", Struct Multidisc Optim, accepted, Jan 2021; pre-print available at www.ersl.wisc.edu.
2. Chandrasekhar, A., Suresh, K. "Multi-Material Topology Optimization using Neural Networks", Computer Aided Design, submitted, Oct 2020; pre-print available at www.ersl.wisc.edu.
3. Kumar, T., Sridhara, S., Prabhune, B., Suresh, K., "Spectral Decomposition for Graded Multi-Scale Topology Optimization", Computer Methods in Applied Mechanics and Engg, accepted, Jan 2021.
4. Kumar, T., Suresh, K. "Direct Lagrange Multiplier Updates in Topology Optimization", Struct Multidisc Optim, accepted, Oct 2020, doi:10.1007/s00158-020-02740-y.
5. Deng, S., Soderhjelm, C., Apelian, D., Suresh, K., "Estimation of Elastic Behavior of Cast Metal Components Containing Process Induced Porosity", Computers & Structures, submitted, Jan 2021.
6. Chandrasekhar, A., Suresh, K. "TOuNN: Topology Optimization using Neural Networks", Struct Multidisc Optim, accepted, Oct 2020); https://dx.doi.org/10.1007/s00158-020-02748-4.
7. Taheri, A. H., Suresh, K. "Surface Approximations using Generalized NURBS, Engineering with Computers, submitted Jan 2021.
8. Subedi, S., Verma, Chaman Singh, Suresh, K."A Review of Methods for the Geometric Post-Processing of Topology Optimized Models", Journal of Computing and Information Science in Engineering, accepted, 2020.
9. Taheri, A., Suresh, K. "Adaptive w-refinement: a new paradigm in isogeometric analysis", Computer Methods in Applied Mechanics and Engineering, accepted, May 2020.
10. Prabhune, B., Suresh, K. "A Fast Matrix-Free Elasto-Plastic Solver for Predicting Residual Stresses in Additive Manufacturing", Computer-Aided-Design, Volume 123, 2020, https://doi.org/10.1016/j.cad.2020.102829.
11. Kumar, T., Suresh, K. "A density-and-strain based K-clustering approach to microstructural topology optimization", Structural and Multidisciplinary Optimization, https://doi.org/10.1007/s00158-019-02422-4 (2019).
12. Taheri, A.H., Abolghasemi, S., Suresh, K. "Generalizations of non-uniform rational B-splines via decoupling of the weights: theory, software and application," Engineering with Computers (2019). https://doi.org/10.1007/s00366-019-00799-w.
13. Liu, J., Gaynor, A.T., Chen, S. et al. "Current and future trends in topology optimization for additive manufacturing", Struct. Multidisc. Optim. (2018) 57: 2457.

Editor Service
2014-   Associate Editor, Journal of Computer Aided Design
2011-   Associate Editor, Journal of Computing and Information Science in Engineering

Recent Patents
1. Suresh, K., Taheri, A., "Systems for generalizing rational non-uniform b-splines and applications of systems", US Patent filed through WARF, 2016.
2. Suresh, K., Verma, C. S., "Singularity reduction in quadrilaterial meshes", US Patent filed through WARF, 2016.
3. Suresh, K., Mirzendehdel, A. M., "Support structure constrained topology optimization for additive manufacturing", US Patent filed through WARF, 2016.
4. Suresh, K, Danczyk, J., "Method to carry out accurate finite element analysis over a tangled mesh", US Patent filed through WARF, 2013.