SRIDHAR KOTA

Herrick Professor of Engineering, University of Michigan, Ann Arbor
Executive Director, MForesight – Alliance for Manufacturing Foresight
Director, Compliant Systems Design Laboratory
Professor of Mechanical Engineering
Founder & CEO, FlexSys Inc. and Inspire Rx LLC, Ann Arbor, MI

Professional Experience

Academic:
1987- present: Professor of Mechanical Engineering, University of Michigan. Teaching and research in mechanical design, bio-inspired compliant systems, adaptive structures & soft robots.

2013-2015: Director, Institute for Manufacturing Leadership (Policy, Education and Outreach)

2015-present: Executive Director, MForesight: Alliance for Manufacturing Foresight

Government
September 2009-April 2012: Assistant Director for Advanced Manufacturing at the White House Office of Science and Technology Policy, Executive Office of the President. Conceptualized and championed the establishment of National Manufacturing Innovation Institutes, National Robotics Initiative and National Design Engineering and Manufacturing Initiative.

Entrepreneurial
Jan 2001- Present: Founder & CEO FlexSys Inc., Ann Arbor, MI. Applications of Complaint Design; Invented, developed and flight-tested world's first shape-changing aircraft wing.
April 2020- Present: Founder & CEO Inspire Rx LLC, Ann Arbor, MI. Clinically-proven, portable negative pressure devices to treat Covid-19 patient and protect healthcare workers.

Industry
Served as consultant to numerous firms including Allied Signal, BASF, Bendix, Gillette, Ford, GM, Johnson Controls, MEMX and Wright Patterson Air Force Base
Manufacturing Engineer - Piper Industries-Impact Extrusion Division, New Albany, MS

Technology Think-Tank
2015- Present: Founding Executive Director, MForesight: Alliance for Manufacturing Foresight – a federally-funded national consortium (think-and-do tank) for emerging technologies and advanced manufacturing.

Education
Ph.D. in Mechanical Engineering, University of Minnesota; M.S.M.E, University of Minnesota; M.S. Materials Engineering, University of Mississippi; B.S.M.E Osmania University, India

Honors, Awards and Highlights

- University of Michigan Office of Research Distinguished University Innovator Award (2017)
- University of Michigan Regents' Award for Distinguished Public Service (2014).
- Mechanical Engineering Achievement Award, University of Michigan (2012)
- American Society of Mechanical Engineers (ASME) Ruth and Joel Spira Outstanding Educator Award (Society Award 2010)
- ASME Swanson Foundation White House Fellowship (2009-12).
- ASME Machine Design Award – highest honor bestowed by the American Society of Mechanical Engineers in Engineering Design (2004)
- ASME Leonardo Da Vinci Award (1997) "for significant original contributions to the field of mechanical design through invention of a device with practical applications"
- ASME Fellow (2002)
- Five Best Paper Awards from American Society of Mechanical Engineers and American Institute for Aeronautics and Astronautics (AIAA).
- Two Teaching Excellence Awards by the Department of Mechanical Engineering, University of Michigan (1995, 1993)
- Society of Automotive Engineers Ralph Teetor Educational Award (1993).
- Six Student Design Competition Awards for Innovative Designs
- Sole inventor and co-inventor of over 35 U.S. and International Patents.
- Primary advisor for 22 doctoral dissertations, several Masters' projects and several hundred undergraduate design projects.
- Published over 200 technical papers on mechanical design, bio-inspired compliant design – theory, synthesis methods and applications to automotive, aerospace and medical fields.
- Co-author of an undergraduate text book "Mechanisms Design", Prentice Hall, Third Edition, 2002.
- Delivered Invited seminars and Keynote presentations at various events and organizations including: the University of Cambridge, MIT, UC-Berkeley, Stanford, Cornell, Northwestern, Illinois, Minnesota, Maryland, MIT, U-Texas-Austin, Boeing, Sikorsky, Gulfstream, Lockheed, United Technologies, General Motors, General Dynamics, Ford, 3M, Toyota, Microsoft, NASA, Air Force Research Labs, White House Office of Science and Technology Policy, Engineering Deans Symposium, The Ditchley Foundation-U.K., USDA, NIST, National Defense Industry Association, ASME, and the National Academies.

Selected (recent) Publications

1. Kota S., Shape Shifting Things to Come, *Scientific American*, May 2014, pp 58-65
2. J. Bishop-Moser, S. Kota, 'Design and Modeling of Generalized Fiber-reinforced Pneumatic Soft Actuators," IEEE Transactions on Robotics, Jan. 2015
3. Kota S., Twistable Wings Take Flight, *IEEE Spectrum*, September 2016, pp 28-33

4. S. Kota, J. Talbot-Zorn, T. Mahoney, How the U.S can Rebuild Its Capacity to Innovate, *Harvard Business Review*, Oct. 2018
5. S. Kota, T. Mahoney, Innovation Should be Made in the USA, Wall Street Journal, Nov. 2019
6. Kota S., Mahoney T., Reinventing Competitiveness, *American Affairs Journal*, Summer 2019.

Research and Innovation: A New paradigm in Engineering Design
Taking a page from designs in nature, Kota developed methods for synthesizing strong but flexible mechanical systems without joints which led to a new paradigm in engineering design called Distributed Compliant Design. This new paradigm in mechanical systems design has wide range of applications including micro-electro-mechanical systems, medical devices, shape-adaptive structures for automotive and aerospace fields. Scientific American (May 2014) called Kota's transformational research as "Flexible Bio-inspired Machines are the Future of Engineering." His latest work on elastofluidics led to new building blocks for designing soft robots.

Entrepreneurship and Technology Transfer: The aerospace community has known for decades that eliminating drag-producing hinged flaps with seamless shape adaptive control surfaces, could significantly improve aircraft fuel efficiency and reduce noise. This long-sought goal—chased by the aviation industry and researchers for nearly 50 years—has finally been realized for the first time in modern aviation history in November 2014 (under a joint Air Force/NASA program) when the FlexFoil shape adaptive technology invented by Kota took to skies. Having concluded a three-year flight test campaign NASA concluded that Kota's wing reduces aircraft noise by 30% and offers significant fuel savings. Pentagon has issued a contract to retrofit its military transport aircraft with Kota's Flexfoil technology for fuel savings.

Technology and Public Policy: From 2009-2012, Kota served as the Assistant Director for Advanced Manufacturing at White House Office of Science and Technology Policy. In this role, he initiated a national dialogue on importance of advanced manufacturing and played an instrumental role in defining the innovation policy to strengthen U.S Advanced Manufacturing. He initiated and championed the establishment of President Obama's national manufacturing innovation institutes announced in March 2012. To-date, over $ 3 billion were invested by the public & private sectors in 14 National Manufacturing Institutes. Kota also orchestrated the establishment of National Robotics Initiative & the White House Modeling & Simulation Initiative.

National Think-and-do Tank on U.S. Manufacturing Competitiveness: Kota is the founder and executive director of MForesight: Alliance for Manufacturing Foresight - a federally-funded (NSF & NIST) national consortium focused on accelerating technological innovation to enhance U.S manufacturing competitiveness. Its Leadership Council consists of 35 senior business executives across diverse manufacturing sectors and thoughts leaders from NGOs and academia. MForesight serves as the voice of the nation's advanced manufacturing community, identifying game-changing technology opportunities and challenges to inform public and private stakeholders on policy and investments. MForesight provides industry, academia, and government with emerging technologies worth scaling (ex: Biomanufacturing) and cross-cutting manufacturing challenges worth researching (ex: Cyber security)

Op-eds; Featured Articles in Popular Press (since 2014)

- S. Kota, G. Daehn, "The Pandemic has Revealed the Cracks in the U.S. Manufacturing: Here's How to Fix Them", The Conversation.com
- S. Kota, T. Mahoney, "Loss of the Industrial Commons: An Existential Threat to U.S. Prosperity and National Security", 2020 Conference on Policies To Improve the Competitiveness of US Manufacturing, Indiana University and the Hudson Institute.
- S. Kota, T. Mahoney, 'Establishing a National Manufacturing Foundation", Day One Project – State of Innovation 2020: Bold New Ideas for the Future, Jan 2020.
- Kota S., T. Mahoney, Innovation Should be Made in the U.S.A, Wall Street Journal, Nov 15, 2019
- S. Kota, Brain Drain – Is the U.S. Offshoring Innovation, Mechanical Engineering, American Society of Mechanical Engineers, October 2019
- S. Kota Interview, Why the U.S. Needs a Bold Innovation Strategy, Smart Manufacturing, SME, Nov. 2018
- S. Kota, Michigan's Surprising Leadership on College Affordability, Detroit News, August 2018
- S. Kota, How to rebuild U.S. Manufacturing, American Society for Engineering Education, Prism, *Last Word*, Sept 2018
- S. Kota, America is Outsourcing Innovation and We Need to Bring it Back, The Hill, Jan 2018.
- J. Talbot-Zorn, S. Kota, Universities Must Help Educate Woefully Uninformed Lawmakers, Wired magazine, Jan 2017
- S. Kota, J. Talbot-Zorn, Slightly Better iPhones will not fix the U.S. Economy, Forbes, Jan 2017
- S. Kota, J. Talbot-Zorn, Missing Link for American Manufacturing, The Hill, Sept 2015
- S. Kota, J. Talbot-Zorn, Reimagining University Rankings, Huff Post, Nov 2015
- S. Kota, Engineering 2.0: Rekindling American Ingenuity, Feb 2014

Lists of Patents, Keynote Presentations/Invited Seminars, Courses developed, Industry Consulting projects, PhD Students, and Publications

Patents

1. S. Kota, Adjustable Robotic Mechanism, U.S Patent Number 5,107,719
2. Kota S., Bidare S., Plural output differential with co-axial shafts, U.S. Patent 5,423,726.
3. Kota S., Bidare S., N-Output Differential, U.S. Patent 5,435,837. Implemented in Hyundai Santa Fe 2001.
4. Y. Koren and S. Kota, Reconfigurable Machine Tool, U.S. patent 5,943,750.
5. S. Kota, System for Varying A Surface Contour, U.S. Patent No. 5,971,328, Oct 26, 1999
6. S. Kota, System for Varying A Surface Contour, U.S Patent No. 6, 491, 262, Dec 10, 2002. European patent 1047593, German DE 69934210T2
7. Rinn A., Khamly S., Hornick D., Obrigkeit M., Kota S., Variable Camber Airfoil, U.S. Patent No. 6,045,096
8. S. Kota, J. Hetrick, S. Rodgers, Z. Li, Compliant Displacement Amplification Apparatus for Micro Electro Mechanical Systems. U.S. Patent No. 6,175,170
9. S. Kota, Compliant Force-Distribution Arrangement for Window Wiper, U.S. Patent No. 6,301,742 B1
10. Y. Moon, S. Kota, Reconfigurable Power Spindle, U.S. Patent No. 6,309,319 B1
11. Y. Moon, S. Kota, Reconfigurable Tool Changer, U.S Patent No. 6, 442, 815.
12. Hetrick J., Kota S., Displacement amplification structure and device, U.S patent 6,557,436.
13. Y. Koren, Y-M Moon, S. Kota, Reconfigurable Multi-Spindle Apparatus, US patent 6,569,071 B1.
14. S. Kota, J.A Hetrick, Compliant Windshield Wiper Systems, US Patent 7,360,272 B2
15. S. Kota, Adaptive Compliant Wing and Rotor Systems, US 7,384,016 B1, Brazilian patent PI 0408101-3, Canadian 2,518,080, European 04749349.9-2422
16. S. Kota, G.F. Ervin, and J.A. Hetrick, Compliant Structure for Varying surface contours, International Patent number WO 2007/145718 A2
17. S. Kota, Adaptive Compliant Wing and Rotor System, German DE 60 2004 029 655.4-08
18. S. Kota, Adaptive Compliant Wing and Rotor System, Spain ES 2353612
19. S. Kota, Z. Kreiner, Y.M. Moon, Compliant Iris Flow Control System, U.S Patent 7,648,120 B1
20. J.A. Hetrick, G.F. Ervin, S. Kota, Rotor Blade Arrangement, U.S. 2009-0302168-A1
21. Ervin G., D. Maric, Ervin, J., Kota S., Hetrick J., Surface Vibration Using Compliant Mechanical Amplifier, U.S. 2010/0224024 A1
22. S. Kota, G. F. Ervin., D. Maric, J.D. Ervin, P.W. Keberly, " Active Control Surfaces for Wind Turbine Blades, U.S. 20100259046
23. S. Kota, F.W. Euwe, Surgical Tools and Components Thereof, U.S. 8.394,116 B2, March 2013
24. J.A. Hetrick, S. Kota, G. Ervin, Compliant Structure Design of Varying Surface Contours, 8,418,966 B2, April 2013
25. J.A. Hetrick, S. Kota, G.E. Ervin, Compliant Structure Design of Varying Surface Contours, WO 2007145718 A2
26. J.A. Hetrick, G.E Ervin. S. Kota, Complaint Structure Design for Varying Surface Contours, U.S patent 8814101 B2.
27. J. Bishop-Moser, S. Kota, Fiber Reinforced Actuator, U.S. Patent 9835184
28. S. Kota, G. F. Ervin, J-H- Lo, K-J Lu, D. Maric, M.R. Trsot, R-K Tsang, Edge Mrphing Arrangement for An Airfoil, U.S Patent 00619010 A1

29. S. Kota, R. Schartow, Deployable Compliant Mechanism, U.S. 0314588 A1 (2017)
30. S. Kota, i-Witness Camera system for Crime Deterrence, Utility patent pending (filed 2018)
31. S.S. Kota, S. Kota, K. Ward, D. Hornick, Personal Respiratory Isolation System, filed April 2020

Several others Pending.

Keynote Presentations

Technology and Innovation Policy (since 2010)

(on Innovation and U.S.-Based Manufacturing; Revitalizing American Manufacturing for economic and national security; Challenges and Opportunities in Advanced Manufacturing)

- S. Kota, T. Mahoney, "Loss of the Industrial Commons: An Existential Threat to U.S. Prosperity and National Security", 2020 Conference on Policies To Improve the Competitiveness of US Manufacturing, Indiana University and the Hudson Institute.
- S. Kota, T. Mahoney, 'Establishing a National Manufacturing Foundation", Day One Project – State of Innovation 2020: Bold New Ideas for the Future, Jan 2020.
- Long Term Manufacturing Strategy, Defense Manufacturing Conference, Dec 2019
- Purdue University - NSF Workshop on Engineering Design and Systems Engineering, "Investing in U.S. Innovation Ecosystem, Oct, 2019
- NSF Workshop on Future of Work in Manufacturing, Montreal, April 2019
- (Invited) White House Office of Manufacturing and Trade, "Grand Challenges in U.S Manufacturing", April 11 2018.
- (Invited)White House National Science and Technology Council, "MForesight: Alliance for Manufacturing Foresight," January 07, 2016
- University of Pennsylvania, Engineering 2.0: Rekindling Technological Innovation and Advanced Manufacturing," May 2015
- Invited Speech at KISDI Global Conference 2014: ICT Convergence and Innovation, "Innovation Policies and Federal Initiatives to Revitalize American Manufacturing," South Korea, November 07, 2014.
- Keynote address - "Revitalizing American Manufacturing – Putting "&" back in R&D," The Idea Institute, Triad Growth Partners, Greensboro, NC September 19, 2014
- ASME Advanced Design and Manufacturing Impact Forum Keynote on "Revitalizing American Manufacturing – Innovation Policies & Initiatives," Buffalo – New York, August 18, 2014
- IEEE/INCOSE Panel on "Meeting Education Demands of Future Energy Systems," AIAA Propulsion and Energy Conference, Cleveland, July 28, 2014
- Keynote address – "Revitalizing American Manufacturing – Putting "&" back in R&D," Nanocellulose Nanomaterials – A Path Towards Commercialization conference, U.S. Department of Agriculture, Washington DC, May 20 2014

- The Ditchley Foundation Conference, The future of manufacturing: is 're-shoring' the new name of the game? Ditchley Park, Enstone, Chipping Norton, OX7 4ER, UK23-25 January 2014
- Mechanical Engineering Driving the National Agenda, ASME Mechanical Engineering and Mech. Engineering Technology (ME/MET) Department Heads Forum, IMECE, San Diego, Nov 2013.
- Keynote address, National Science Foundation Micro/Nanomanufacturing Conference, May 2013, Dearborn, MI
- Keynote address, The Automation Conference, Chicago, May 2013.
- Invited Lecture, Bridging the Innovation Gap – Federal Initiatives, Challenges and Opportunities, Design of Medical Devices Conference, Minneapolis, MN, April 10 2013.
- Invited Seminar, Innovation Policies and Initiatives to Revitalize American Manufacturing, University of Minnesota, February 13, 2013
- Engineering Deans Symposium, Engineering 2.0: Closing the Innovation Gap, Washington DC., February 12, 2013
- Opportunities for Engineering Graduates in Science and Technology Policy, College of Engineering Seminar, University of Michigan, February 07,2013
- Keynote address at the Toyota Technical Center on Innovation and U.S.-based Manufacturing, Dec 01, 2012, November 01, 2012
- HPC's Role in the Future of American Manufacturing, Supercomputing (SC12) Conference, Salt Lake City, November 13, 2012
- @Microsoft Conversations Advanced Technologies and the U.S. Manufacturing Renaissance, Washington DC October 23, 2012
- Chicago Manufacturing Research Council Executive Committee Lecture, Oct 10, 2012
- University of California – Berkeley; Delivered Richard Newton Distinguished Innovator Lecture, September 18, 2012
- Heroes Alliance 5th Annual Parental Boot Camp on STEM Education- Keynote lecture, Detroit, June 09, 2012
- Oakridge National Research Laboratory Distinguished Lecture, Oakridge, TN, July 24, 2012
- MC3 Tech Connect/General Dynamics Keynote Lecture, June 14, 2012
- University of Illinois – Urbana Champaign National Center for Supercomputing Applications – Keynote Lecture, May 09, 2012
- University of Texas-Austin Cockrell School of Engineering Seminar on Frontiers of Manufacturing Technology, Austin, TX, Feb. 27 2012
- The Manufacturing Institute and EWI – Manufacturing Accelerator Network: Creating an American Innovation Infrastructure to Advance U.S. Manufacturing Competitiveness, Washington DC, Feb 15 2012
- National Academies – Strengthening American Manufacturing: The Role of Manufacturing Extension Partnership, Nov 14 2011, Washington DC
- Council on Competitiveness – Computational Modeling and Simulation enabling innovation and Manufacturing Competitiveness, Washington DC, Oct 25, 2011
- MODSIM World Conference & Expo 2011 – Modeling and Simulation to Enhance Manufacturing Competitiveness, Virginia Beach VA, Oct 11, 2011
- American Society of Naval Engineers – Global Deterrence and Defense Symposium "Innovation to Outpace the Threat", Bloomington, IN, Sept 12 2011

- ASME International Design Engineering Technical Conference, Washington DC August 30, 2011.
- Arkansas Center for Excellence Forum - Advanced Structural Materials for Design and Manufacturing, University of Arkansas, Little Rock AK, August 24, 2011
- NARCO – Network of Academic Corporate Relations Officers, 2011 Annual Conference, University of Michigan, Ann Arbor, August 1 2011
- AUVSI/ NDIA – The Transportation Technology Transfer Initiative, Crustal City, VA, May 24, 2011
- The National Academies – Building the Ohio Innovation Economy, Cleveland, Ohio, April 25 2011
- NIST, NSF, USCAR Workshop on Developing Dependable and Secure Automotive Cyber-Physical Systems from Components, Troy, MI, March 18, 2011
- University of Connecticut Engineering Distinguished Lectures, Storrs, CT, Mar. 22, 2011
- The National Academies – The Flexible Electronics Opportunity and Industry Challenges, Phoenix, AZ, February 8, 2011
- NIST- Extreme Manufacturing Workshop, January 11, 2011
- National Information Technology R&D, HCSS/CPS – Innovation and U.S. based Manufacturing – Role of Cyber physical Systems, Arlington VA, Dec 15 2010
- Defense Manufacturing Conference / National Defense Industry Association - OSTP Policy Perspective, Las Vegas NV, Dec 2, 2010
- Center for Strategic and International Studies – Innovation and Advanced Manufacturing, Washington DC, Nov. 16 2010.
- The National Academies – Flexible Electronics or Security, Manufacturing, and Growth in the United States, Washington DC, September 24 2010
- Implementing 21st Century Smart Manufacturing, Washington DC, September 14, 2010
- United States Advanced Ceramics Association Tech Mtg., Washington DC May 20, 2010
- NIST Technology Innovation Program Advisory Board Meeting, Gaithersburg, MD May 11, 2010
- Joint Defense Manufacturing Technology Program, Washington DC, April 26 2010.

Keynote Address /Seminars – Technical (since 2001)

- Keynote address at the University of Minnesota, “Being Flexible – Exploiting Elasticity in Engineering Design,” MN-Drive 2016 Robotics, Sensors and Advanced Manufacturing Symposium, April 8, 2016
- Invited speech at NASA Technical Interchange Meeting, Langley VA, “Adaptive Compliant Trailing Edge”, March 30, 2016
- Gulfstream Aerospace Corporation – Innovation Lecture Series “Compliant Design – Variable Geometry Control Surfaces,” Savannah, GA, June 11 2014
- Mechanical Engineering Department Seminar Series, University of Maryland Baltimore Country, April 11, 2008
- Adaptive Control Surfaces for Helicopter Rotor Blades, Sikorsy Aircraft, March 2008
- General Motors Vehicle Engineering Center – Design for No-Assembly November 2008
- Advances in Adaptive Structure and Active Flow Control, NASA Langley Research Center
- First International Symposium on Compliant Mechanisms, Indian Institute of Science, Bangalore, India, December 17, 2007.

- National Chung Hsing University, Taichung, Taiwan R.O.C. November 30, 2007.
- General Electric Corporate Research and Development, Schenectady, NY, Aug 7, 2007
- Ford Research and Innovation Center, October 27, 2006.
- NASA Lewis Research Center, Cleveland, OH Sept 28, 2006
- Exploiting Elasticity in Engineering Design, Cambridge University, Engineering Design Seminar Series, Cambridge, United Kingdom, May 30 2006
- 3M Advanced Technologies - Compliant Systems – Design and Applications, Dec. 2005
- Illinois Institute of Technology, Chicago, Departmental Seminar, Compliant Systems – Synthesis Methods and Applications
- Advances in Active Flow Control and Adaptive Structures, United Technologies Research Center, Hartford, CT, April 2005.
- Computational Synthesis of Mechanical Systems, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania, May 2004.
- Compliant Systems – Design Methods and Applications, Department of Mechanical Engineering, University of Maryland, March 2003
- Product Design for No-assembly, Delphi Systems Research Council Colloquium, February 2004.
- Compliant Systems –Design Methods and Applications at Micro, Meso and Macro Scale, Department of Mechanical Engineering Seminar Series, Michigan Technological University, Oct , 2003.
- "Exploiting Elasticity in Engineering Design – Synthesis Methods and Applications, Mechanical and Aerospace Engineering Department Seminar Series, Cornell University, Ithaca, NY, Feb 04, 2003.
- "Compliant Mechanism: Design Methods and Applications to Shape Morphing Structures," ICASE Lecture Series-Morphing, NASA Langley Research Center, Hampton, VA. May, 2002.
- "Complaint Systems: Synthesis Methods and Applications", Mechanical Engineering Department Seminar Series, Northwestern University, October. 2001.
- "Exploiting Elasticity in Engineering Design: Synthesis Methods and Applications", Mechanical Engineering Department Seminar Series, Massachusetts Institute of Technology, Sept. 28 2001.
- "Compliance in Engineering Design and in Nature", Symposium on Biologically Inspired Materials and Design, SEM Conference on Experimental and Applied Mechanics, Portland, Oregon, June 2001.
- "Design of Compliant Systems", United Technologies Research Center, Hartford, CT, May 2001.
- "Complaint Systems: Applications to MEMS and Smart Structures", Stanford University Mechanical Engineering Department, March 2001.

Teaching

- Advised 22 Ph.D. graduates, numerous MS projects, and several hundred undergraduate design projects in Mechanical Engineering at the University of Michigan.
- Developed a new Freshman Engineering Couse - ENG 100: Designs in Nature and Engineering, Fall 2014, Fall 2016, Winter 2019

- Taught junior, senior and graduate-level courses, in mechanical design and short courses for on-campus students and practicing engineers.
- Taught senior level course in Design for Manufacturability – first offering in Fall 1991 (through 2006 by Kota). This course was the first offering of its kind to teach Japanese design and production process, design for assembly, statistical design of experiments, material selection in design etc. Course was also taught to hundreds of practicing engineers across several industrial sectors.
- In collaboration with a core team of faculty, the senior design course was revamped in 1990 to include construction and validation of original designs through physical prototype demonstrations. Junior level design course was also revamped in a similar fashion by Kota.
- Led the development of educational modules in engineering design for high schools students (2008).
- Orchestrated and taught the initial offering of a college-wide interdisciplinary design course.
- Developed Design for Manufacturability Course (ME 452). First offering Fall-1990. Taught every year since to on-campus and off-campus practicing engineers. http://gpd.engin.umich.edu/
- Developed a graduate course in advanced kinematics -ME 551: Advanced Mechanisms Design.
- Short Courses: "Creative Mechanisms Design," Center for Professional Development, University of Michigan; 'Design for Manufacturability, June 2004, Schlumberger Corporation

Ph.D. Advisees

1. **Audrey Sedal,** Continuum Mechanical Models for Design and Characterization of Soft Robots; May 2020; Researcher, Toyota Research Institute.
2. **Joshua Bishop-Moser**, Design of Generalized Fiber-Reinforced Elasto-Fluidic Systems, December 2013.; Senior Researcher, MForesight: Alliance for Manufacturing Foresight.
3. **Girish Krishnan**, Computational Synthesis of Distributed Compliant Mechanisms, August 2011. Assistant Professor, University of Illinois, Urbana-Champaign.
4. **Michael Cherry**, Design and Evaluation of Compliant Exoskeletons for Human Running. Co-chair Daniel Ferris- Kineseology. Research engineer, Raytheon Missile Corporation, Tucson, AZ
5. **Youngseok Oh**, Synthesis of Multi-stable Compliant Mechanisms, August 2008 – presently Research Engineer at Intel Corporation, Portland Oregon.
6. **Christine Vehar Jutte**, Generalized Synthesis Methodology of Non Linear Springs for Prescribed Load-Displacement Functions, December 2007 – Research engineer at NASA Armstrong
7. **Brian Patrick Trease**, Topology Synthesis of Compliant Systems with Embedded Actuators and Sensors, November 2007 – Professor, University of Toledo
8. **Tanakorn Tantanawat**, Design of Compliant Systems for Dynamic Applications, June 2007 presently at National Metals and Materials Technology Center, Thailand.
9. **Charles Kim**, Conceptual Design of Compliant Mechanisms using Instant Centers and Building Blocks, August 2005. Professor of Mechanical Engineering, Bucknell University.

10. **Kerr-Jia Lu**, Compliant Mechanism Synthesis for Shape Change Applications, August 2004. Senior Research Engineer, FlexSys Inc.
11. **Sang-Ku Moon**, Error Prediction and Compensation of Reconfigurable Machine Tools, April 2002.
12. **Jinyong Joo**, Non-linear Synthesis Methods for Designing Compliant Mechanisms – Topology and size and shape optimization, May 2001. Research Scientist, University of Dayton Research Institute.
13. **Yong-Mo Moon**, A Generalized Methodology for Synthesis of Reconfigurable Machine Tools Using Screw Theory. December 1999. Senior Research Engineer, Lockheed Martin Corporation
14. **Joel Hetrick**, An Energy Efficiency Approach for Unified Topological and Dimensional Synthesis of Compliant Mechanisms, August 1999. Senior Research Engineer, Ford Motor Company.
15. **Ronald Kalnas**, Mechanical System Behavior Prediction Incorporating Non-Gaussian, Non-Parametric Uncertainty at the Conceptual Stage, May 1999, Research Engineer, Westinghouse, Pittsburgh, PA
16. **Laxman Saggere**, Static Shape Control of Smart Structures: A New Approach Utilizing Compliant Mechanisms, December 1998. Professor, University of Illinois - Chicago, IL.
17. **Mary Frecker**, A Hybrid Approach to Synthesis of Compliant mechanisms using Kinematics and Structural Mechanics, May 1997. Co-Chair – Prof. Noboru Kikuchi Professor of Mechanical Engineering, Pennsylvania State University.
18. **G.K. Ananthasuresh**, A New Design Paradigm for MicroElectroMechanical Systems & Investigations on Compliant Mechanisms Synthesis, Ph.D. Dissertation, October 1994. Professor, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania, Philadelphia, PA.
19. **Irfan Ullah**, Optimal Synthesis of Adjustable Mechanisms for Tracing Three-Dimensional Trajectories, Ph.D. Dissertation, September 1994. Professor, NWFP University of Engineering and Technology, Pakistan.
20. **Shean-Juinn Chiou**, Conceptual Design of Mechanisms by Computational Synthesis of Kinematic Building Blocks, Ph.D. Dissertation, August 1994. Professor and Chair of Mechanical Engineering, National Chung-Hsing University, Taichung, Taiwan.
21. **Thatchai Chuenchom**, Generalized Synthesis of Adjustable Robotic Mechanisms for Manufacturing Automation, Ph.D. Dissertation, 1993. Professor, Thammasat University, Pathumthani, Thailand.
22. **Chun-Liang Lee**, Functional Approach to Systems Configuration Design with Application to Hydraulic Systems, Ph.D. Dissertation, May 1992. Senior Research Engineer, Ford Motor Company, Dearborn, MI
23. **Michael Sayers**, Automated Formulation of Efficient Vehicle Simulation Codes by Symbolic Computation, Ph.D. Dissertation, February 1990, Co-Chair - Prof. Robert Ryan. Senior Research Scientist, University of Michigan Transportation Research Institute

Consulting

- Ford Motor Co.- Engine Division, Dearborn, Michigan
  Evaluation and re-design of engine assembly methods at the Romeo Engine Plant. Design for Assembly. Improved Assembly operations for Exhaust manifold assembly.
- Ford Climate Control Division, Dearborn, Michigan
  Air-handling systems design. Common/Ideal blend door design. Design of cam systems to linearize the temperature control curve.
- Johnson Controls, Automotive Seating Division, Livonia, Michigan
  Design evaluation of a nutating gear system for seat applications.
- Bendix Corporation, South Bend, Indiana
  Design evaluation and failure mode analysis of a hydraulic brake hose.
- Stevens Graphics - Bernall Division, Rochester Hill, Michigan
  Design effort estimates of various special purpose machines.
- Gillette Corp., Boston, Massachusetts
  Design of high-speed cam systems for very high volume production.
- BASF Corporation, Wyandotte, Michigan
  Redesign of a ribbon-type blenders.
- Stirling Thermal Motors, Ann Arbor, Michigan
  Design of a novel actuator system for torque control of a Stirling engine.
- CSA Engineering subcontract for Wright Patterson Air Force Base, Ohio
  Design of a novel variable torsional-stiffness spar.
- Johnson Controls, Plastic Machinery Division, Manchester, Michigan.
  Design evaluation and failure mode analysis of a splined shaft.
- Denardis, MCCandless & Muller: Court case involving garbage-truck controls
- Jones, Day, Reavis & Pogue: Court case involving patent litigation.
- Sandia National Labs – Design of micro mechanisms - MEMS-Multipliers
- General Motors Corp. – Innovation Zone: Product Architecture Flexibility.
- MEMX Inc., Micromechanical Structures Design

Publications

Refereed Journals

1. Bassin BS, Haas NL, Puls A, S. Kota, S.S. Kota et al. Rapid development of a portable negative pressure procedural tent. International Journal of Tuberculosis and Lung Disease. 2020 Jul 1;24(7):740–3. DOI: 10.5588/ijtld.20.0317
2. Haas NL, Bassin BS, Kota S, et al. Rapid development of a novel portable negative pressure device. International Journal of Tuberculosis and Lung Disease. 2020 Jul 1;27(7):737–9. DOI: 10.5588/ijtld.20.0282
3. Kota S., Mahoney T., Reinventing Competitiveness, *American Affairs Journal*, Summer 2019.
4. Sedal, Audrey, Bruder, Daniel, Bishop-Moser, Josh, Vasudevan, Ram and Kota, Sridhar. "A Continuum Model for Fiber-Reinforced Soft Robot Actuators." *Journal of Mechanisms and Robotics*10.2 (2018): 024501
5. J. Bishop-Moser, S. Kota, 'Design and Modeling of Generalized Fiber-reinforced Pneumatic Soft Actuators," IEEE Transactions on Robotics, Jan. 2015
6. G. Krishnan, J. Bishop-Moser, C. Kim, S. Kota, 'Kinematics of a General Class of Pneumatic Artificial Muscles,' J. of Mechanisms and Robotics, Dec. 2014.
7. S. Kota, Shape-Shifting Things to Come, Scientific American, pp. 58-65, May 2014
8. G. Krishnan, C. Kim, S. Kota. 'A Metric to Evaluate and Synthesize Distributed Compliant Mechanisms,' J. Mech. Des. 135, 011004 (2013).
9. G. Krishnan, C. Kim, and S. Kota. "Building block method: a bottom-up modular synthesis methodology for distributed compliant mechanisms," Mechanical Sciences 3 (2012).
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