RESUME

AJAY MAHAJAN

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EXPERIENCE

Professor (Mechanical Engineering & Biomedical Engineering) Jan 2015 - Present

- Teach senior level courses in Robotics and Controls.
- 20% appointment at the Akron Children's Hospital as Senior Scientist. Multiple initiatives at the Akron Children's Hospital to reduce healthcare costs and develop devices designed for pediatrics.
- *Chair, Investment Committee for the Akron BioInvestment Fund II* ($1.75M venture fund).
    - Chair a committee of 11 members from the community to vet the financials of companies wanting to move/grow in Akron, OH
    - Have made three investments so far leading to job creation and a healthy ecosystem
- *Board member for the Bell Chapter of the Hawkins Foundation in Akron* whose mission is to develop new initiatives to collect patient outcome data
- Data-analytics initiative at the VA to improve patient outcomes, reduce hospital readmissions and develop processes to identify hospital inefficiencies

Associate Vice President for Innovation (Vice Provost position) Oct 2013 – Jan 2015
Office of Academic Affairs (Provost's Office)

- Charged by the President to lead a University-wide effort on developing new market driven initiatives to enhance revenues for the University. This effort was designed to be a prelude to the University going to an RCM budget system. The effort was vetted over a year with all academic units before being deployed, and was designed to keep 65% revenues in the units as incentive (the cost to be covered by the units from their share). The remaining 35% would go to the General Fund.
- Appointed as Chair of 1 of 5 Team of Leaders (TOL) that comprised senior University leadership. Each TOL comprised of no more that 5-6 members with ranks of Associate VP and higher. Reported directly to the Senior Executive VP for this effort.
- Chair of the Innovation Team of Leaders (members: Assoc VP for Innovation, Assoc. VP for Research, CIO, Assoc VP and General Counsel, Assoc CFO)
    - Developed new university wide initiatives in online strategy and licensing models to other universities
- Member of the Academic Affairs Team of Leaders which was chaired by the Provost (Members: Provost, VP and General Counsel, VP for Research, Vice Provosts, Assoc VP for Innovation)
    - Reviewed all academic programs and discontinued 48 programs in an effort to cut costs. This was done using comprehensive due process including reviews by the faculty senate, and incorporating their recommendations
    - Started the process of reviewing all university research centers and institutes for increased efficiency and effectiveness
- Lead the submission of a proposal to APLU/Gates Foundation for unbundling education to reduce costs. UA was 1 of 7 universities that were funded for this initiative.

Special Assistant to the President for Innovation July 2013 – June 2014
Office of the President

- Appointed to be on President Obama's Operations Committee for the *Advanced Manufacturing Partnership 2.0*, representing the UA President who was one of nineteen members in the Steering Committee comprising Presidents/CEOs from academia (MIT, Georgia Tech, UC Berkeley, U. Michigan, RPI, U. Akron), industry (Siemens, Dow, Northrup Grumman, Honeywell, Alcoa, etc.) and labor. Contributed to the effort by doing a deep dive in many technologies and developing recommendations that will provide a competitive advantage to US advanced manufacturing for many years to come.
- Appointed by the President to increase University productivity, especially in terms of increasing new sources of revenues. Created a stage-gate process at the University to vet ideas for new programs that would ensure margins.
- Key University-committee participation ***(Chair of both committees for 2012-13)***
  - *President's Innovation Incubator Group*: Tasked with developing new revenue models for the University.
  - University wide *Integrated Financial Planning Group (IFPG)* set up by the Provost and the CFO to develop new budget models for the University. Membership included Associate Deans, Directors and main budget officers from all units of the University.
- Was part of an NSF sponsored Multi-University effort on *Institutions Developing Excellence in Academic Leadership (IDEAL)* wherein a strategy was developed to increase diversity in the UA faculty. Many of the recommendations after the 3-year effort have been incorporated at all participating universities.

Associate Dean for Research, College of Engineering August 2009 – June 2015
Professor of Mechanical Engineering August 2009 - Present
Professor of Biomedical Engineering August 2009 - Present

- Represented The University of Akron in the TechBelt team (NE Ohio + Pennsylvania) in developing the winning proposal for establishing the *National Additive Manufacturing Innovation Institute* (NAMII) as the pilot institute of President Obama's vision fir 14 such institutes forming the National Network of Manufacturing Institutes (NNMI). This is a $70M public-private enterprise and has served as a model for other such institutes.
- Co-PI on two major grants from the Department of Defense (DoD) totaling over $17M to create the National Center for Education and Research on Corrosion and Materials Performance (NCERCAMP) at the University of Akron
- Orchestrated the development of the Timken Engineered Surfaces Laboratory (TESL) at the University to lower research costs, and increase their market share in specific non-mission centric products/services by spinning out joint ventures between the company and the university research foundation. Over $5M deal to move labs and an Endowed Chair to the University, and co-wrote the business plan for the joint venture expected to be a $100M business in 10 years. The model has been cited by major national newspapers and journals as a unique industry-academia collaboration that creates real value for the region and the nation.
- Developed a strategic plan for research to put the College of Engineering on a 10-year trajectory to be a top 100 College of Engineering in the US according to US News rankings. College ranking increased from approx 150 (2008) → 129 (2009) → 125 (2010) → 121 (2011) → 119 (2012) → 121 (2013) → 117 (2014).
- Research expenditure increased from $4M (2009) to over $16M (2012) in 3 years, and then increased to $16.4M in 2013, and then to $17.2M in 2014.
- Developed an engagement model for the college and increased interaction with local industry, including obtaining a $2M 3rd Frontier grant on sensors for clean technologies.
- Faculty effort coordinator for the College under the new ECRT computerized process.

- Faculty pre-award department liaison between the College and the University Research Office.
- In charge of the college IDC account and grant cost-sharing for the college.
- Significantly increased the number of multidisciplinary and multi-million dollar proposals to the state, federal agencies and industry.
- Very engaged with state and US Senators, Congress people and other regional representatives to create jobs and wealth in the region through innovation.
- Served on the Advisory Boards of
    - PRISM (Partnership for Regional Innovation Services to Manufacturers), an outreach activity of MAGNET (Manufacturing Advocacy and Growth Network for NE Ohio)
    - NorTech
- Lead the development of the execution plan for a $2M University-wide Innovation Practice Center modeled on the Deshpande Center at MIT. Was invited by the Deshpande Foundation to be the plenary speaker at their first conference at Lowell in 2011.

Akron Surface Technologies, Inc.
Vice President and Co-Founder May 2012 – July 2013
Member, Board of Directors July 2013 – June 2015

- Co-Founder and Board member for Akron Surface Technologies, Inc. (ASTI), the for-profit joint venture between the Timken Company and the University of Akron Research Foundation. Helped develop the business plan and financials, the initial capitalization and the day-to-day operations/execution. ASTI was recognized as 1 of 7 innovation award winners by NorTech in 2013. Previously served as Vice President before transitioning to the Board of Directors.
- Brought in customers, and helped in developing the technical/sales/marketing team.
- Helped in running the day-to-day operations for 1 year before hiring a full time CEO.

Clipius Technologies, Inc. March 2004 – Present
President and Co-Founder

- Ran all necessary operations required for a start-up (research, development, accounting, patents, proof-of-concepts, contracting, negotiations, etc).
- Wrote the business plans for the umbrella company as well as the two subsidiary companies.
- Clipius was runners up in the 2008 Illinois Innovate Competition (2nd out of 130 companies from all over Illinois including Chicago and Urbana-Champaign).
- Primary POC for all interaction with investors, patent lawyers, contract lawyers, accountants, sub-contractors and companies.

Southern Illinois University, Carbondale, IL
Department of Mechanical Engineering and Energy Processes (MEEP)
Professor (Tenured) August 2004 – August 2009

- The *Dean Juh Wah Chen Outstanding Faculty Award* for 2008 in the College of Engineering.
- **ABET Coordinator** for the Fall 2008 ABET accreditation visit for the ME program. Completely redesigned the assessment process and helped write the "ME Program Self Study" report submitted to ABET, June 30, 2008.
- Was on numerous occasions the **Acting Chair** of the department (attended open houses, Chairs and Directors' meetings, student registrations, etc)
- ***First Prize*** in the medical category of NASA's 2007 "Create the Future" Design Contest for a neuro-navigation system for brain surgery. Featured on Discovery Channel and NASA Tech Briefs.
- Received the 2008 SIUC Excellence Through Commitment **Outstanding Scholar Award** for the College of Engineering.
- Funded projects from NASA Stennis Space Center, ICCI, Toyota Motorsport Group (Formula One race

team based in Cologne, Germany) and Caterpillar.
- Spent sabbatical leave in 2005 touring Europe working on a Formula One project and giving technical presentations (England, Germany and Italy).
- The *Dean Kenneth E. Tempelmeyer Outstanding Faculty Research Award* for 2004 in the College of Engineering.
- "Outstanding Teacher Award" in the MEEP department for the 2004-2005 academic year.
- Started a ***Biomedical Research Initiative*** whose goal is to have physicians, engineers and scientists work under a single umbrella and funded thru the State, Federal agencies and industry. Involved Tyco Healthcare as one of the contributors.

Associate Professor (Tenured) August 98 - July 2004
- The *Dean Juh Wah Chen Outstanding Research Paper Award* for 2003 in the College of Engineering.
- "Outstanding Teacher Award" in the MEEP department for the 2000-2001, 2002-2003 and 2003-2004 academic years.
- Played a significant role in the successful accreditation effort in 2002 at SIUC. Helped design all the outcome assessment tools under the EAC 2000 guidelines, as well as conducted the final assessment analysis.

Lake Superior State University, Sault Ste. Marie, MI
School of Engineering and Technology
Associate Professor (Tenured) August 97 - August 98
- Member of the University Grants Committee.
- Chair of the School's Research Committee.

Director, Autonomous Systems Laboratory May 96 - August 98
- Worked on numerous projects/training sessions from industry (GM, Algoma Steel, Hoover, etc.).

Assistant Professor August 94 - May 97
- Served on the University Curriculum Committee and the Individualized Studies Committee.
- Developed undergraduate laboratories for Dynamics, Controls, DSP, Heat Transfer and FEA.
- Faculty Advisor for Senior Design Projects from American Drilbox, Chrysler and Takata, Inc.

EDUCATION

Doctor of Philosophy GPA: 4.00/4.00 July 1994
Mechanical Engineering, Tulane University, New Orleans
Ph.D. Dissertation: Dynamic Across Time Autonomous - Sensing, Interpretation, Model learning and Maintenance Theory (Autonomous Sensing).

Master of Science GPA: 4.00/4.00 July 1992
Mechanical Engineering, Tulane University, New Orleans
Master's Thesis: A Navigation System for Guidance and Control of Autonomous Vehicles based on an Ultrasonic 3D Location System.

Bachelor of Engineering Gold Medal May 1990
Mechanical Engineering, University of Roorkee (now called I.I.T. Roorkee), India
Senior Project Thesis: Design and Development of a Low Cost Wheel Balancing Machine for Automotive Service Workshops.

Honors and Awards

- **Pays de la Loire Award** to give an invited seminar at the University du Maine, Le Mans, France, Nov 2011.
- The first recipient of the **2008 Honorary Award in Intelligent Systems** from the Model Identification and Intelligent Systems Technical Committee (MIIS-TC) in ASME. This award is given every two years for significant contributions and service in the area of intelligent systems.
- Received the annual **Dean Juh Wah Chen Outstanding Faculty Award** for 2008 in the College of Engineering.
- **First Prize** in the medical category of **NASA's 2007 Create the Future Design Contest** for a neuro-navigation system for brain surgery. Award ceremony in New York city, and the invention featured in NASA Tech Briefs, and to be featured on the Discovery Channel.
- Received the University wide 2008 SIUC Excellence Through Commitment **Outstanding Scholar Award** for the College of Engineering.
- Received the annual **Dean Kenneth E. Tempelmeyer Outstanding Faculty Research Award** for 2004 in the College of Engineering.
- Received the annual **Dean Juh Wah Chen Outstanding Research Paper Award** for 2003 in the College of Engineering.
- **Outstanding Teacher Award** in the MEEP department for the 2000-2001, 2002-2003, 2003-2004 and 2004-2005 academic years.
- **NASA Certificates of Recognition (**An Optic Fiber Based Strain Gage & Physical Intelligent Sensors)

Service to the profession and community

- Plenary speaker at multiple ArchAngels Investors quarterly meeting in Akron.
- Helped redefine the Launchtown Business idea Competition for students from multiple universities in NE Ohio. The total package for winners is over $25,000 in cash and services. Board member (2010-2012). Also championed numerous other student business plan competitions.
- Started the ***Akron-ICE program*** that embeds entrepreneurship into the graduate curriculum by bringing together graduate students from STEM, business and law and residents/fellows working in hospitals, and connects them to the regional network of investors/executives.
- Founding member of the ***StudioE*** and ***Efund***, whose mission was to foster and nurture entrepreneurship (especially high-tech) in the Southern Illinois region. The *StudioE* is a physical meeting place while the *Efund* is an endowment. Also, part of the local CEO club and convinced numerous CEOs to donate part of their time to help guide start-up companies in the region.
- Actively supported the Science Center (in Carbondale, IL, and now in Cleveland, OH), Southern Illinois Music Festival, Symphony and the *Klassics for Kids*. Wrote the ***business plan for the SI Summer Festival*** to obtain funding from the State, University, corporate sponsors and patrons.

REVIEWER

Journals ASME/IEEE Transactions on Mechatronics, ASME Transactions on Mechanical Design ASME Transactions on Dynamic Systems, Controls and Measurement, IEEE Transactions on Neural Networks, Journal of Vibration and Control, IEEE Controls Systems Magazine, International Journal of Systems Science, Journal of Intelligent and Fuzzy Systems, Journal of Adaptive Infrastructures, IEEE Transactions on Robotics and Automation, Measurements

Conferences ASME IMECE, ACC, ASEE, DETC, SPIE

Proposals National Science Foundation (NSF), Department of Homeland Security (DHS), NATO

Editorial Board: Journal of Adaptive Infrastructures

APPENDIX

GRANTS (Funded Research)

1. **Mahajan, A**., "Low-cost, clinically relevant remote infant monitoring platforms to improve patient outcomes and reduce healthcare costs - Phase II," Akron Children's Hospital, Jan 2019, 1 year, $33,436.
2. **Mahajan, A**., "Wireless OR for Pediatric Surgeries," Akron Children's Hospital, May 2018, 1 year, $41,554.
3. **Mahajan, A**., "Low-cost, clinically relevant remote infant monitoring platforms to improve patient outcomes and reduce healthcare costs," Akron Children's Hospital, Jan 2018, 1 year, $32,351.
4. **Mahajan, A**., "Next generation genome editing technology," Controlled Environment Genomics, June 2017, 1 year, $15,846.
5. Sherman, W. M., **Mahajan, A.** and Lampner, W., "A Transformational Plan to Unbundle Higher Education," APLU/USU and Bill and Melinda Gates Foundation, Washington DC, July 2014, 1 year, $225,000.
6. **Mahajan, A.**, "Infrasound Research," TII-VA, LaPlace, LA, Sept 2012, 1 year, $10,000.
7. **Mahajan, A.** and Menzemer, C., "The Development of the Research Infrastructure for the Conquer Chiari Research Center," Conquer Chiari Foundation, Pittsburgh, PA, March 2012, 1 year, $140,000.
8. **Mahajan, A.** and Menzemer, C., "Infrastructure build out for the Timken Engineered Surfaces Laboratory (TESL)," The Timken Company, Canton, OH, Nov 2011, 1 year, $1,400,000.
9. Haritos, G., **Mahajan, A.,** Payer, J., and Louscher, S., "National Center for Education and Research on Corrosion and Materials Performance: Enhancing and Sustaining Technical Support for the Office of Corrosion Policy and Oversight," ERDC- CERL, DoD, July 2011, 3 years, $7,230,000.
10. Haritos, G., **Mahajan, A.,** Payer, J., and Louscher, S., "National Center for Education and Research on Corrosion and Materials Performance: Technical Efforts to Support the Office of Corrosion Policy and Oversight," ERDC-CERL, DoD, July 2011, 3 years, $9,190,000.
11. **Mahajan, A.** and Mohanty, M., "Development and Demonstration of an Automation and Control System for Coal Spirals," DCEO/ICCI, 2009, 1.5 years, $149,897. Note: Transferred to Drs. Manoj Mohanty and Haibo Wang at SIUC.
12. **Mahajan, A**. and Wang, H., "An Ultrasonic Tracking System for Motion Capture Studies in Ergonomic Applications – Phase III," Caterpillar, 2008, 1 year, $95,031.
13. **Mahajan, A**. and Wang, H., "An Ultrasonic Tracking System for Motion Capture Studies in Ergonomic Applications – Phase II," Caterpillar, 2007, 1 year, $75,720.
14. Don, J. and **Mahajan, A.**, "A Bamboo Derived Sorbent Cartridge (BDSC) for Mercury Removal from Flue Gases and Water," DCEO/ICCI, 2007, 1 year, $39,939.
15. Schwartz, B. and **Mahajan, A**., "Urology Research at Southern Illinois University – School of Medicine," SIU-SOM, Department of Surgery, 2007, 2 years, $70,000.
16. Mohanty, M. and **Mahajan, A**., "Automation and performance Improvement of Spiral Concentrator," DCEO/ICCI, 2006, 1 year, $159,622.
17. **Mahajan, A**. and Wang, H., "An Ultrasonic Tracking System for Motion Capture Studies in Ergonomic Applications," Caterpillar, 2006, 1 year, $39,995.
18. **Mahajan, A**., "Development of Physical and Virtual Intelligent Sensors within an Integrated System Health Management Paradigm," NASA, 2005, 1 year, $50,000.
19. Schwartz, B. and **Mahajan, A**., "Biomedical Research Initiative," Tyco Healthcare, 2 years, $10,000.
20. Schwartz, B. and **Mahajan, A**., "Biomedical Research Initiative," SIUC-VCR and SIU-SOM, 2 years, $52,000.
21. Mohanty, M., **Mahajan, A**. and Sevim, H., "Use of Artificial Intelligence for Developing a Novel Coal Preparation Plant Simulator," DCEO/ICCI, 2005, 1 year, $159,986.
22. **Mahajan, A.** and Chu, T., "An Integrated Framework for the Intelligent Monitoring of Smart Elements," NASA, 2004, 1 year, $50,000.
23. Filip, P., **Mahajan, A.** and Don, J., "Neural Network Modeling of Wear in Formula One Race Car Brakes," Toyota Motorsports Group, 1 year, 2004, $350,000.
24. **Mahajan, A.** and Mohanty, M., "Performance optimization of a coal preparation plant using genetic algorithms," DCEO/ICCI, 2003, 1 year, $116,661.
25. **Mahajan, A.**, "A novel fiber optics based method for liquid oxygen (LOX) tank mass measurement in a rocket test facility," NASA Glenn Research Center, 2003, 1 year, $19,545.
26. **Mahajan, A**., Chu, T., Pendakur, M. and Jaehnig, W., "A Multidisciplinary Approach to develop Web-Based Smart Tutors within a Seamless Learning Environment," ORDA, SIUC, 2003, 1 year, $15,704.

27. **Mahajan, A.** and Allen, J., "An intelligent sensor monitoring system for rocket propulsion testing and integrated vehicle health management," GSRP award, NASA Glenn Research Center, 2003, 2 years, $42,016.
28. Yen, M., **Mahajan, A**., Dave, B., Viswanathan, R. and Marikunte, S., "Health Monitoring of Highway Bridges," Federal Highway and Illinois DOT, 2003, 2 years, $620,495.
29. Yen, M., **Mahajan, A**., Chu, T., Agrawal, O. and Craddock, J., "Development of intelligent transportation systems," Illinois Department of Commerce and Community Affairs (IDCCA), 2001, 2 years, $147,220.
30. Chu, T. and **Mahajan, A.**, "Analysis of short crack growth in particulate composites" Airforce Research Laboratory (AFRL), 2001, 1 year, $50,000.
31. **Mahajan, A.**, "Intelligent system for monitoring and control of foot pressure levels in diabetic patients with the use of smart materials," MTC, SIUC, 2001 2 years, $38,000.
32. Chu, T. and **Mahajan, A.**, "Strain measurement on particulate composites," Airforce Research Laboratory (AFRL), 2000, 6 months, $9,300.
33. **Mahajan, A.**, "Intelligent sensors for a smart structural health monitoring system for composite structures," MTC, SIUC, 1999, 2 years, $34,000.
34. **Mahajan, A.**, "The design and development of a low cost 3D ultrasonic positioning system for tracking in virtual reality applications," ORDA, SIUC, 1998, 2 years, $25,000.
35. McDonald, D., **Mahajan, A.** and Walworth, M., "Development of an innovative integrated learning environment for laboratory instruction in engineering," NSF, 1997, 2 years, $56,000 (an additional $56,000 matched by LSSU).
36. Devaprasad, J., **Mahajan, A**., and Walworth, M., "Manufacturing education enhancement," Society of Manufacturing Engineers (SME), 1997, 1 year, $120,000.
37. **Mahajan, A.**, "Multipurpose data acquisition system development," CAMILE Inc., 1997, 1 year, $21,000.
38. Devaprasad, J., **Mahajan, A**., Walworth, M. and Schwiderson, K., "Manufacturing education enhancement," Society of Manufacturing Engineers (SME), 1996, 1 year, $160,000.
39. **Mahajan, A.**, "Development of intelligent sensor models," SME Education Foundation for research in Intelligent Sensors, 1996, 1 year, $15,000.
40. **Mahajan, A.**, "Development of an Engineering Ethics course for the occupational programs," Michigan Dept. of Education vocational ed. program, 1996, 3 months, $3000.
41. Walworth, M., Devaprasad, J., **Mahajan, A**., and Madl, J., "Manufacturing education enhancement," Society of Manufacturing Engineers (SME), 1995, 1 year, $72,000.
42. **Mahajan, A.**, "Development of a laboratory for data-acquisition systems for senior level courses," US Title III program, 1995, 3 months, $3000.

JOURNAL PUBLICATIONS

1. Figueroa, F. and Mahajan, A., "A Robust Navigation System for Autonomous Vehicles using Ultrasonics," *Control Engineering Practice*, Vol. 2, No. 1, pp. 49-54, February 1992.
2. Figueroa, F. and Mahajan, A., "Generic Model of an Autonomous Sensor," *Mechatronics*, Vol. 4, No. 3, pp. 295-315, 1994.
3. Figueroa, F. and Mahajan, A., "A Robust Method to Determine the Coordinates of a Wave Source for 3-D Position Sensing," *ASME Transactions on Dynamic Systems, Measurements, and Control*, Vol. 116, pp. 505-511, September 1994.
4. Mahajan, A. and Figueroa, F., "Dynamic Across Time Autonomous - Sensing, Interpretation, Model Learning and Maintenance Theory," *Mechatronics*, Vol. 5, No. 6, pp. 665-693, 1995.
5. Mahajan, A. and Figueroa, F., "Intelligent Seam Tracking using Ultrasonic Sensors for Robotic Welding," *Robotica*, Vol. 15, pp. 275-281, 1997.
6. Mahajan, A. and Figueroa, F., "Four Legged Intelligent Mobile Autonomous Robot," *Robotics and Computer-Integrated Manufacturing*, Vol. 13, No. 1, pp. 51-61, 1997.
7. Mahajan, A. and McDonald, D., "A Unique Digital Signal Processing Laboratory Experience Using Integrated Systems and Modern Computer Tools," *ASEE Computers in Education Journal*, Vol. VIII, No. 4, pp. 40-44, October-December, 1998.
8. Mahajan, A. and Valentine, A., "A Novel Multi-faceted Approach to a Heat Transfer Laboratory Using Modern Computer Tools," *ASEE Computers in Education Journal*, Vol. IX, No. 2, pp. 56-60, April-June 1999.
9. Mahajan, A. and Figueroa, F., "An Automatic Self Installation & Calibration Method for a 3D Position Sensing System using Ultrasonics," *Robotics and Autonomous Systems*, Vol. 28, No. 4, pp. 281-294, September 1999.

10. Mahajan, A. and Walworth, M., "3D Position Sensing using the Difference in Time-of-Flights to Various Receivers from a Single Transmitter of Wave Energy," *IEEE Transactions on Robotics and Automation*, Vol. 17, No. 1, pp. 91-94, February 2001.
11. Mahajan, A., Wang, K. and Ray, P. K., "Multisensor Integration and Fusion using a Fuzzy Inference System," *IEEE/ASME Transactions on Mechatronics*, Vol. 6, No. 2, June 2001.
12. Chu, T., Mahajan, A. and Liu, C., "An Economical Vision Based Method to Obtain Whole-Field Deformation Profiles," *Journal of Experimental Techniques*, Vol. 26, No. 6, pp. 25-28, Nov/Dec 2002.
13. Ray, P. K. and Mahajan, A., "A Genetic Algorithm-Based Approach to Calculate the Optimal Configuration of Ultrasonic Sensors in a 3D Position Estimation System," *Robotics and Autonomous Systems*, Vol. 41, pp. 165-177, 2002.
14. Unnikrishnan, N., Ray, P.K. Mahajan, A. and Chu, T., "Accuracy Considerations in a 3D Ultrasonic Positioning System that uses the Difference in Time-of-Flights," *ASME Transactions on Dynamic Systems, Measurements, and Control*, Vol. 124, No. 4, pp. 688-693, Dec. 2002.
15. Pilch, A., Mahajan, A. and Chu, T., "Intelligent Image Correlation using Genetic Algorithms for Measuring Surface Displacements and Deformation," *ASME Transactions on Dynamic Systems, Measurements, and Control*, Vol. 126, pp. 479-488, September 2004.
16. Paliwal, M., Mahajan, A., Don, J., Chu, T. and Filip, P., "Noise and Vibration Analysis in a Disc-Brake System using a Stick-Slip Friction Model involving Coupling Stiffness," *Journal of Sound and Vibration*, Volume 282, Issues 3-5, pp 1273-1284, 22 April 2005.
17. Unnikrishnan, N., Mahajan, A. and Chu, T., "Intelligent System Identification of an Ultrasonic 3D Positioning System," *Journal of Systems and Control Engineering*, Vol. 217, Part I, pp. 367-377, May 2003. *This paper won the Dean Juh Wah Chen Outstanding Research Paper Award for 2003 in the College of Engineering, SIUC.*
18. Chu, T., Mahajan, A., DiGregorio, A. and Russel, S., "Determination of Optimal Experimental Parameters for Transient Thermography Imaging using Finite Element Models," *The Imaging Science Journal*, Vol. 53, pp. 20-26, 2005.
19. Lavu, B. Schoen, M. and Mahajan, A., "Adaptive Intelligent Control of Ionic Polymer Metal Composites (IPMC)," *Smart Material Structures*, Vol. 14, pp. 466-474, 2005.
20. Paliwal, M., Mahajan, A., Don, J. and Filip, P., "Investigation of high frequency squeal in a disc brake system using a friction layer-based coupling stiffness." *Journal of Mechanical Engineering Science*, Vol. 19, pp.513-522, 2005.
21. Bandhil, P., Chitikeshi, S., Oesch, C., Mahajan, A. and Figueroa, F., "Physical Intelligent Sensors," *Journal of Control and Intelligent Systems*, Vol. 35, No.3, pp. 1-9, 2007.
22. Hahn, C., Mahajan, A., Chu, T. and Schoen, M., "A Lumped Parameter Model to investigate the Effect of Plantar Pressure on Arterial Blood Flow in the Diabetic Foot," *Journal of Engineering in Medicine*, Vol. 221, No. H6, pp. 677-686, August 2007.
23. Gupta, V., Mohanty, M. and Mahajan, A., "Genetic Algorithms – A Novel technique to Optimize Coal Preparation Plants," *International Journal of Mineral Processing*, Vol. 84, pp. 133-143, October 2007.
24. Huang, Z., Mohanty, M.K., Mahajan, A. and Arnold, B., "Techno-Economic Analysis of Coal Preparation Plant Design using Siu-Sim Simulator," *International Journal of Coal Preparation and Utilization*, Vol. 28, Issue 1, pp. 15-32, January 2008.
25. Regez, B., Ying Zhang, Mahajan, A., Don, J. and Chu, T., "In-Plane Bulk Material Displacement and Deformation Measurements using Digital Image Correlation of Ultrasonic C-scan Images," *Structural Engineering and Mechanics*, Vol. 29, No. 1, pp.113-116, May 2008.
26. Huang Z., Mohanty, M.K., Sevim, H., Mahajan A., and Arnold, B., "SIU-Sim: A Novel Coal Preparation Plant Simulator," *Mining Engineering*, Vol. 7, pp. 51-56, July 2008.
27. Abbassi, M., Oesch, C., Utterbach, L., Chitikeshi, S., and Mahajan, A., "Virtual Intelligent Sensors," *Journal of Information, Intelligence and Knowledge*, Vol. 1, Issue 1, pp. 67-82, 2009.
28. Salimi, N., Mahajan, A., Don, J. and Schwartz, B., "A Novel Stone Retrieval Basket for more Efficient Lithotripsy Procedures," *Journal of Medical Engineering and Technology*, Vol. 33, Issue 2, pp. 142-150, February 2009.
29. Regez, B., Sayeh, M., Mahajan, A. and Figueroa, F., "A Novel Fiber Optics Based Method to Measure Very Low Strains in Large Scale Infrastructures," *Measurement*, Vol. 42, Issue 2, pp. 183-188, February 2009.

30. Gupta, V., Unjawala, H., Mahajan, A. and Mohanty, M., "Particle Swarm Optimization Approach for a Coal Preparation Plant," *Journal of Characterization and Development of Novel Materials*, Volume 1, Issue 1, pp. 39-48, 2009.
31. Nandikolla,V., Mathews, J., Schoen, M., Pharkute, S., Reischl, U. and Mahajan, A., "Adaptive Multi Airbag Shoe Insert For Diabetic Foot Care," *ASME Early Career Technical Journal,* Vol 9, pp. 124-129, 2010.
32. Siddiqui, N., Don, J., Mondal, K. and Mahajan, A., "Development of Bamboo Derived Sorbents for mercury removal in Gas Phase," *Environmental Technology*, Vol. 32 Issue 4, March 2011.
33. Mahajan, A., Oesch, C., Padmanaban, H., Utterback, L., Chitikeshi, S. and Figueroa, F., "Physical and Virtual Intelligent Sensors for Integrated Health Management Systems," *International Journal on Smart Sensing and Intelligent Systems*, Vol. 5, No. 3, pp. 559-575, Sept 2012.
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7. Mahajan, A., "A Novel Fiber Optics Based Method for Liquid Oxygen (LOX) Tank Mass Measurement in a Rocket Test Facility," NASA Stennis Space Center, June 07, 2005.
8. Mahajan, A., Don, J. and Filip, P., "Wear modeling in C/C brakes using neural networks," Toyota F1, Cologne, Germany, December 28, 2004.
9. Mahajan, A. and Mohanty, M., "Performance optimization of a coal preparation plant using genetic algorithms," ICCI, October 20, 2004.
10. Chu, T. and Mahajan, A., "Determination of the critical size of damaged areas in particulate composites used as rocket fuel," Air Force Research Lab (AFRL), September 2002.
11. Chu, T. and Mahajan, A., "Fracture mechanics of a particulate composite using the K_I and J Integral approach," Air Force Research Lab (AFRL), July 2002.
12. McDonald, D., Mahajan, A. and Walworth, M., "Final report on the development and implementation of a vertically integrated laboratory environment in engineering," National Science Foundation (NSF), August 1999.
13. Mahajan, A., "Development of generic sensor models with learning capabilities for applications in manufacturing," SME Education Foundation, June 1997.

PUBLISHED BOOK REVIEWS

1. Mahajan, A., Review of "Matrix Algorithm Volume II: Eigensystems," by G. W. Stewart, ASME, *Applied Mechanics Review*, Volume 56, No. 1, p. B2, January 2003.
2. Mahajan, A., Review of "Practical Inverse Analysis in Engineering" by D.M. Trujillo and H.R. Busby, CRC Press, Boca Raton, Fl, *Applied Mechanics Review*, Vol. 52, No. 3, pp. B21-22, March 1999.
3. Qatu, M. and Mahajan, A., Review of "Engineering Analysis with Maple/Mathematica" by A.I. Beltzer, Academic, San Diego, CA, *Applied Mechanics Review*, Vol. 49, No. 3, p. B29, March 1996.

STUDENTS & POST DOCTORAL RESEARCHERS ADVISED

Post Doctoral Researchers

1. Dr. Yicheng Pan (Advisor): 2010-11 - Worked on projects on spine surgery, urology and oncology.
2. Dr. Jun Chin (Advisor): 2008-09 – Worked on a plastic surgery project.
3. Dr. Tim Hargrove (Co-advisor with Dr. Brad Schwartz): 2007-09 – Worked on animal protocols for projects in diabetes and dialysis at the School of Medicine, SIU Springfield.

Ph.D. Students

1. Manish Paliwal, "The Effect of Friction Layer on Noise and Vibration in a Disk Brake System" Ph.D. Dissertation, Graduate School, SIUC, December 2003.
2. Brad Regez, "Nondestructive Evaluation of Friction layer Properties in Brakes using Ultrasonics and Knowledge Based Digital Signal Processing," Ph.D. Dissertation, Graduate School, SIUC, December 2004.
3. Sanjeevi Chitikeshi, "Intelligent Instrumentation and a Robust Dynamic Model for an Ultrasonic Neuronavigation System for Improved Neurosurgery," – Ph.D. Dissertation, Graduate School, SIUC, December 2007.
4. Zahra Najafi, "Novel kidney stone retrieval basket," Ph. D. Dissertation, Graduate School, The University of Akron, August 2015.
5. Padmini Selvaganesan, "Low-cost infant remote monitoring system to improve patient outcomes and reduce healthcare costs," Ph. D. Dissertation, Graduate School, The University of Akron, Expected graduation date: May 2020.

M.S. Students

6. Kaihong Wang, "Intelligent Multisensor Data Fusion for Smart Structural Health Monitoring System," MS Thesis, Graduate School, SIUC, August 2000.
7. Probir Kumar Ray, "Ultrasonic 3D Position Estimation System," MS Thesis, Graduate School, SIUC, February 2001.
8. Alan Pilch, "Intelligent Image Correlation using Genetic Algorithms," MS Thesis, Graduate School, SIUC, August 2002.
9. Nishant Unnikrishnan, "Intelligent System Identification of an Ultrasonic Positioning System using Neural Networks and Genetic Algorithms," MS Thesis, Graduate School, SIUC, August 2002.
10. Andrew Caughlan, "Automatic Generation of Braking and Throttle Profiles for Vehicles in Intelligent Transportation Systems," MS Thesis, Graduate School, SIUC, August 2002.
11. Carrie Hahn, "Modeling the Effect of Plantar Pressure and Tissue Damage on Blood Flow in the Diabetic Foot," MS Thesis, Graduate School, SIUC, November 2002.
12. Chris Leach, "A Framework for Distributed Autonomous Agents," MS Thesis, Graduate School, SIUC, August 2004.
13. Mohan Krishna, "A Novel Fiber Optic Based Strain Gauge System for Liquid Oxygen Tank (LOX) Measurements," MS Thesis, Graduate School, SIUC, December 2004.
14. Amit Mohanty, "Multisensor Fusion for an Integrated Smart Health Monitoring System using Condition Assessment Sheets," MS Thesis, Graduate School, SIUC, December 2004.
15. Jennifer Akers, "Development of an Accurate Neuro-Navigation System that uses Ultrasonics for Real Time Brain Surgery," MS Thesis, Graduate School, SIUC, May 2005.
16. Nicole Salimi, "Development of Stone Removal Basket for Urology Applications," MS Thesis, Graduate School, SIUC, August 2005.
17. Pavan Bandhil, "Physical Intelligent Sensors for the Integrated Structural health Monitoring Systems," MS Thesis, Graduate School, SIUC, December 2005.
18. Jennie Rivers, "The Smart Dynamometer – An Offline System," MS Thesis, Graduate School, SIUC, August 2006.
19. Haricharan Padmanaban, "Real Time Implementation of Physical Intelligent sensors," MS Thesis, Graduate School, SIUC, October 2006.
20. Chris Oesch, "Intelligent Sensors with Embedded Algorithms for ISHM Applications," MS Thesis, Graduate School, SIUC, November 2006.
21. Vyshali Chitikeshi, "An Intelligent Monitoring System for Diabetic Footcare," MS Thesis, Graduate School, SIUC, December 2007.
22. Mohammad Abbasi, "Intelligent Sensor Algorithms Embedded in a LABVIEW Environment," MS Thesis,

Graduate School, SIUC, February 2008.

23. Joel Hoelscher, "Development of a Robust, Accurate 3D Ultrasonic Tracking System for Image Guided Surgery," MS Thesis, Graduate School, SIUC, December 2008.
24. Ganeshram Dasari, "Development of a Robust 3D Ultrasonic Tracking System for Motion Capture Studies," MS Thesis, Graduate School, SIUC, December 2008.
25. Suraj Thyagaraj, "Design and Development of a Dynamic System for a 3D Ultrasonic Position Estimation System," MS Thesis, Graduate School, SIUC, December 2009.
26. Jason King, "New generation of spinal implants to reduce shock during reconstruction surgery," MS Thesis, Graduate School, The University of Akron, August 2012.
27. Esra Cipa, "Engineered surfaces for improved orthopedic implants," MS Thesis, Graduate School, The University of Akron, May 2015.
28. Alex Russell, "A Low Cost Portable Monitoring Solution For Seamless Patient Data And Wireless Vitals Monitoring In The Operating Room," MS Thesis, Graduate School, The University of Akron, Dec 2018.