Kuldeep Agarwal

CONTACT INFORMATION

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EMAIL

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CITIZENSHIP

India

EDUCATION

The Ohio State University, Columbus, OH, USA
Ph.D., Industrial and Systems Engineering (minor in Data Mining), 2011

- Dissertation: Physics Based Hierarchical Decomposition of Processes for Design of Complex Engineered Systems
- Advisor: Professor Rajiv Shivpuri

M.S., Applied Statistics, 2010

M.S., Industrial and Systems Engineering, 2003

- Dissertation: Rapid Tooling for short run Forgings
- Advisor: Professor Rajiv Shivpuri

Indian Institute of Technology (IIT), Kharagpur, India
B.Tech (Honors), Manufacturing Science and Engineering, 2001

- Thesis: Design and Manufacturing of Plastic Injection Mold for transformer bobbin

RESEARCH EXPERIENCE

Minnesota State University, Mankato, MN
Associate Professor *August, 2017 - Present*
Assistant Professor *August, 2012 – July, 2017*

- Additive manufacturing of novel materials with varied applications in medical implant industry and tissue engineering
- Process improvement and process and product redesign in several areas with multiple companies.
- About $5 million process improvement projects with local and regional industries
- Fundamental studies on the effect of process parameters on mechanical and physical properties of additive manufactured parts
- Process – Structure – Property relationship in powder metallurgy components
- Design and analysis of metal forming processes including forging, rolling, extrusion etc.

The Ohio State University, Columbus, OH
Postdoctoral Research Associate *September, 2011 – August, 2012*

- Quality and Reliability of wind energy bearings
- Development of mechanistic and statistical models predicting life of wind energy bearings
- Clustering based techniques for enhancing life of aeroengine disks
- Characterization of nanostructures produced by Plasma processing

Graduate Research Assistant *September, 2007 – September, 2011*

- Defect Diagnostic System Using Data Mining for Hot rolling mills
- Rapid Prototyping of Hot forging dies for Aerospace Industry
- Hot workability of Steels based on sequential regression methods

TEACHING EXPERIENCE

Minnesota State University, Mankato, MN

Associate Professor *August, 2017 - Present*

Assistant Professor *August, 2012 – July, 2017*

- Courses taught:
  - → MET 277: Manufacturing Processes
  - → MET 425: Project Valuation, Management and Justification (developed)
  - → MET 488: Senior Design Project
  - → AET 378: Composites Manufacturing
  - → MET 428: Lean Manufacturing (developed)
  - → MET 625: Advanced Project Management (developed)
  - → MET 489: Senior Design Project II
  - → MET 275: Manufacturing Process I
  - → MET 465: Lab Experience
- Developed new course material for Project Management and Lean Manufacturing course
- Introduced video based teaching modules for manufacturing processes

Teaching evaluation averages across all the courses (out of possible 5):

	AU12	SP13	AU13	SP14	AU14	SP15	AU15	SP16
Course as a whole	4.1	4.4	4.6	4.6	4.7	4.7	4.6	4.7
Instructor's contribution to course	4.3	4.5	4.6	4.5	4.5	4.6	4.6	4.7
Amount you learned in course	4.2	4.5	4.6	4.5	4.6	4.5	4.6	4.5
Evaluative & grading techniques	4.2	4.4	4.5	4.6	4.6	4.5	4.6	4.6
Student confidence in instructor's knowledge	4.9	4.8	4.8	4.7	4.7	4.6	4.7	4.9
Average	4.36	4.5	4.58	4.58	4.61	4.63	4.67	4.76

Engineering Education Innovation Center, The Ohio State University,

Lab Instructor/Teaching Associate January, 2009 – June, 2011

Courses:

- → Fundamentals of Engineering (ENG 181, 183)
- → Fundamentals of Engineering for Scholars (ENG 183.02)

- Participated in development of Advance Energy Vehicle design and build project for Scholars
- Development of Introduction to programming using MATLAB course material for First Year Engineering program
- Lab Instructor for Roller coaster design and build project (3 quarters)
- Grading of lab reports, memos and exams for 36 students each quarter
- Average Student evaluation - 4.7/5.0 (average of 8 quarters)
- Instruction of MATLAB to freshman engineering students
- Instruction of technical drawing fundamentals and AUTODESK INVENTOR

Integrated Systems Engineering, The Ohio State University
Teaching Associate Sept. 2002 – June 2003, Sept. 2007 – June 2008

- Development of computer and machine lab assignments and coordinating labs for undergraduate/graduate course on Manufacturing processes (ISE 607, ISE 311)
- Course & class coordination for course on Manufacturing of Automotive Components (ISE 666).
- Coordination with General Motors students as a part of Distance Learning program of the course (ISE 666).

ADMINISTRATIVE EXPERIENCE

Undergraduate Research Center, Minnesota State University, Mankato, MN
Director *August, 2017 - Present*

- Manage the UG research activities
- Grants for student and faculty research
- Funding for Student travel for National Conference of Undergraduate Research
- Organization of Undergraduate Research Symposium

Department of Automotive and Manufacturing Engg. Tech., MSU Mankato, MN
Coordinator, Professional Science Masters in Engineering Management

- Review of applications for admission
- Promotion and advertisement of program across the state
- Coordination of Industry projects and Internships
- Accreditation of program with NPSMA
- Course evaluations and online course development with faculty

INDUSTRIAL EXPERIENCE

Ganpati Moulders (India), Delhi (an ISO 9001:2000 Certified company)
Director (Technology) July 2003-July 2007

- Design and development of molds for plastic injection molding
- Development of products for medical industry
- Design and development of products for energy and power sector
- Rapid prototyping by Fused Deposition Modeling (FDM) and Selective Laser Sintering (SLS)
- Testing and analysis of incoming Plastic raw material for quality
- Management and supervision of production line
- Manufacturing of plastic injection molded components
- Vendor development and Quality Auditor
- Planning and delivery of components to Multi National Companies

- In depth operating and technical knowledge of machining (CNC, EDM, Wire EDM, Laser Jet machining) and Injection molding.

Undergraduate Intern, Tata Motors, Jamshedpur, India**,** May 2000- July 2000
- Production planning of sheet metal molds for tool room
- Inventory optimization for tool room

PUBLICATIONS

Journal Articles

1. Vangapally, S., **Agarwal, K.,** Sheldon, A., Cai, S., "Effect of Lattice Design and Process Parameters on Dimensional and Mechanical Properties of Binder Jet Additively Manufactured Stainless Steel 316 for Bone Scaffolds", Procedia Manufacturing, Vol. 10, 2017, Pg. 750-759
2. Doyle, M., **Agarwal, K**., Sealy, W., Schull, K., "Effect of Layer Thickness and Orientation on Mechanical Behavior of Binder Jet Stainless Steel 420 + Bronze Parts", Procedia Manufacturing, Vol. 1, 2015, Pg. 251-262
3. **Agarwal, K.**, Shivpuri, R., Poulain, N., "Design of No-Twist Mill Parameters for Minimized geometric variation in the hot bar rolling of steels", Iron and Steel Technology, Aug. 2015, Page 143-150 (Featured Article)
4. **Agarwal, K.**, Shivpuri, R., Bonthapally, V., "Process-Structure-Microstructure Relationship in Hot Strip Rolling of Steels Using Statistical Data Mining", Procedia Engineering, Vol. 81, Pg. 90-95, 2014
5. **Agarwal, K.**, Shivpuri, R., "On line prediction of surface defects in hot bar rolling based on Bayesian hierarchical modeling", Journal of Intelligent Manufacturing Vol. 26, No. 4 (2013), Pg. 785-800, DOI: 10.1007/s10845-013-0834-y
6. **Agarwal, K.**, Shivpuri, R., Vincent, J., Rolinski, E., Sharp, G., "DC pulsed plasma deposition of nanocomposite coatings for improved tribology of gray cast iron stamping dies" Journal of Material Processing Technology, Vol. 213 (2013), Pg. 864-876.
7. **Agarwal, K.**, Shivpuri, R., "Knowledge Discovery in steel bar rolling mills using scheduling data and automated inspection" Journal of Intelligent Manufacturing (2013), DOI: 10.1007/s10845-013-0730-5
8. **Agarwal, K.**, Shivpuri, R., "An On-Line hierarchical decomposition based bayesian model for quality prediction during hot strip rolling", ISIJ Intl., Vol. 52 (2012), No. 10, pp. 1861–1870
9. **Agarwal, K**., Shivpuri, R., Zhu, Y., "Robust design of No-Twist-Mill parameters for reduced geometric variation in the hot rolling of steel rods and coils", Steel Research International – Special Edition on 10th International Conference on Technology of Plasticity, 2011, Pg. 137-142
10. Shivpuri, R., Singh, S., **Agarwal, K**., Liu, C., "Energy Release Rate based Approach for the Wear of Punches in Precision Blanking of High Strength Steel", CIRP Annals - Manufacturing Technology, Vol. 60, Issue 1, 2011, Pg. 307-310
11. **Agarwal, K.,** Shivpuri, R., Zhu, Y., Chang, T.S., Huang, H., "Process knowledge based Multi-class support vector classification (PK-MSVM) approach for surface defects in Hot Rolling", Expert Systems With Applications, Volume 38, Issue 6, June 2011, Pg. 7251-7262
12. Shivpuri, R., Cheng, X., **Agarwal, K**., Babu, S., "Evaluation of 3D printing for dies in low volume forging of 7075 aluminum helicopter parts", Rapid Prototyping Journal, Vol 11, No. 5, 2005, Pg. 272-277

Conference Proceedings (Peer-Reviewed)

1. **Agarwal, K.**, Houser, M., Vangapally, S., Vulli, A., "Process – Property relationships in Additive Manufacturing of Nylon-Fiberglass composites using Taguchi Design of Experiments", Proceedings of Solid Freeform Fabrication Symposium, August 7-9, 2017, Austin, TX
2. **Agarwal, K**., Vangapally, S., Sheldon, A., "Binder Jet Additive Manufacturing of Stainless Steel - Tricalcium Phosphate biocomposite for bone scaffold applications", Proceedings of Solid Freeform Fabrication Symposium, August 7-9, 2017, Austin, TX
3. Lassonde, K., **Agarwal, K.**, "Uncovering Innovative Partnerships for Undergraduate Research", National Conference on Undergraduate Research, Memphis, TN, April 6-8, 2017
4. Houser, M., **Agarwal, K.**, "Design and Manufacturing of Polymer Matrix Composites with Additive Manufacturing", SME RAPID Conference, Orlando, FL, May 17-19, 2016
5. Ingenthron, C., **Agarwal, K.**, Ludwig, H., Joel, T., Sealy, W., "Wear Studies in Binder Jet Additive Manufactured Stainless Steel - Bronze Composite", Proceedings of Solid Freeform Fabrication Symposium, Pg. 732-744, August 10-12, 2015, Austin, TX
6. Shivpuri, R., Subramanian, R., **Agarwal, K.,** "Inclusion based design of metal forming processes for failure critical parts", in Proceedings of International Symposium on Plasticity and Its Current Applications, January 4-9, 2015, Montego Bay, Jamaica
7. Shivpuri, R., **Agarwal, K.,** Subramanian, R., "Bayesian Hierarchical modeling based micromechanics computational framework for integrated material and process design for failure critical components", in Proceedings of 11th World Congress on Computational Mechanics (WCCM XI), July 20-24, Barcelona, Spain, 2014
8. Westphal, M., Bentley, M., Sealy, W., **Agarwal, K.**, "Manufacturing of Patient Specific Schlemms' Canal Using Fused Deposition Modeling", SME RAPID Conference, Detroit, MI, June 12, 2014
9. **Agarwal, K.**, Shivpuri, R., "A Computational Framework for Integrated Process Design of High Performance Parts", in 2nd World Congress on Integrated Computational Materials Engineering (eds M. Li, C. Campbell, K. Thornton, E. Holm and P. Gumbsch), John Wiley & Sons, Inc., Hoboken, NJ, USA. doi: 10.1002/9781118767061.ch22, 2013
10. **Agarwal, K.,** Shivpuri, R., Babu, S., Cheng, X., "Low Volume Aluminum Forging Using Metal Based Rapid Prototyping of Dies", Proceedings of NAMRI/SME, Vol. 41, 2013.
11. **Agarwal, K.,** Shivpuri, R., "Hierarchical Decomposition Based Approach to Process Design of Aeroengine Disk in Presence of Defects", Proceedings of NAMRI/SME, Vol. 40, 2012.
12. **Agarwal, K.,** Shivpuri, R., "Integrated modeling of forging processes for safety critical parts", Proceedings of 20th International Forging Congress, Hyderabad, India, November 13-17, 2011 **(Winner of Best Student Paper award)**
13. **Agarwal, K**., Shivpuri, R., Zhu, Y., "Role of Process Dynamics and Material Instability in the Generation of Surface Defects during High Speed Hot Extrusion of Zirconium Tubes", Ed. Dr. Gerhard Hirt and Dr. Erman Tekkaya, Proceedings of 10th International Conference on Technology of Plasticity, Aachen, Germany, Sept. 25-30, 2011, Pg. 255-260

14. Whitfield, C., Schlosser, P., **Agarwal, K**., Riter, E., "Advanced Energy Vehicle Design-Build Project for First-Year Engineering Students", Proceedings of the 2011 ASEE Annual Conference & Exposition, Vancouver, BC, June 26-29, 2011
15. **Agarwal, K.,** Shivpuri, R., "Risk Based Process Design of Titanium Rotor Forgings with High-Risk Low-Frequency Anomalies: a Multi-Body FEM Approach", Proceedings of Conference on Optimizing Performance Through Integrated Modeling Of Microstructure, Cambridge, UK, Oct 5-8, 2010
16. **Agarwal, K.**, Shivpuri, R., "The Role of Manufacturing Process in the Design for Product Risk", Proceedings of the 1st Int. Conf. on Product Property Prediction (P3), Eds. Biermann D, Tekkaya AE and Tilmann W, pp. 59- 71, Technical University of Dortmund, April 12-13, 2010, Dortmund, Germany.
17. Mathur, D., **Agarwal, K.** and Shivpuri, R., "Microstructure Study during Hot Deformation Processing of Aluminum 7075 with Rapidly Engineered Dies", Hot Deformation of Aluminum Alloys, Ed. Z. Jin, A. Beaudoin, T.A. Bieler and B. Radhakrishnan, TMS Annual Meeting, March 3-6, San Diego, CA, 2003.
18. **Agarwal, K.,** Mathur, D., Shivpuri, R. and Lembo, J.,"Evaluation of PROMETAL technique for application to dies for short run forging", Ed. Dr. Joseph Beaman, Solid Freeform Fabrication Proceedings, Austin, TX, 2002, pp. 376-383.
19. **Agarwal, K**., Shivpuri, R. and Lembo, J., "Investigating Rapid Prototype Techniques for Application to Dies for Short Run Forgings", AFDM2002, The Second Int. Conf. on Advanced Forming and Die Manufacturing, 17-19 June 2002, Pusan, Korea.

Conference Proceedings (Non Peer-Reviewed)

1. **Agarwal, K.,** Shivpuri, R., Poulain, N., "Design of No-Twist-Mill Parameters for Minimized Geometric Variation in the Hot Bar Rolling of Steels", The Iron and Steel Technology Conference and Exposition, Indianapolis, IN, May 5-7, 2014
2. **Agarwal, K.**, Shivpuri, R., "Modeling the influence of inclusions on the performance of forged products: process design approach", 29th Forging Industry Technical Conference, Cleveland, OH, September 10-12, 2012
3. **Agarwal, K.,** Shivpuri, R., Singh, A.P., Rath, S., Kumar, S., Mukherjee, D., Mathur, A.S., "An On-Line Hybrid Mathematical Model for Quality Prediction during Hot Strip Rolling", Proceedings of International Conference on Advances in Analytical Techniques and Characterization of Materials, Ranchi, India, July 5-7, 2011
4. **Agarwal, K.**, Shivpuri, R., Ai, X., Pauskar, P., "Bayesian Hierarchical Network based Computational Framework for Risk Tolerant Process Design", Proceedings of the NSF CMMI Grantee Conference, Atlanta, GA, January 4-7, 2011
5. Shivpuri, R., **Agarwal, K.**, Mathur, D., Lembo, J. and Harris, W., "Forging of Aluminum Helicopter Parts using Rapidly Prototyped Dies," Aero Mat 2003, Dayton, OH, June 9-12, 2003.
6. Shivpuri, R., **Agarwal, K.**, Mathur, D., Lembo, J. and Harris, W., "Reduced Lead Times for Forged Helicopter Parts", AHS Forum 59, Proceedings of the American Helicopter Society, Phoenix, AZ, May 6-8, 2003.
7. **Agarwal, K.**, Mathur, D., Shivpuri, R., Lembo, J., Stys, T. and Harris, W., "A Rapid Die Manufacturing Technique for Short Run Forgings", 24th Forging Industry Technical Conference, Research & Applied Technology in the Forging Industry, Cleveland, Ohio, October 14- 16, 2002.

Book Chapters

1. **Agarwal, K.** and Shivpuri, R., "Rapid Tooling for Forging Dies", ASM Handbook, Vol. 14A, Metalworking : Bulk Forming, Ed. S. L. Semiatin, 2005, pp. 645- 650.

Undergraduate Research Conferences (Peer-Reviewed)

1. Rupercht, J., **Agarwal, K.,** "Effect of binder saturation and sintering on stainless steel – hydroxyapatite biocomposite manufactured by 3D Printing", National Conference on Undergraduate Research, Memphis, TN, April 6-8, 2017
2. Hasan, M., Ndonwie, C., Bentley, M., **Agarwal, K.**, "Biocompatibility of Hydroxyapatite and Stainless Steel Alloys", National Conference on Undergraduate Research, Ashville, NC, April 7-9, 2016
3. Lee, J., Karleen, D., Hasan, M., Bentley, M., **Agarwal, K.**, "Biocompatibility of Hydroxyapatite and Stainless Steel Alloys", National Conference on Undergraduate Research, Spokane, WA, April 15-19, 2015
4. White, W., Tunison, D., **Agarwal, K.**, Sealy, W., "Low Cost Welding Based Metal 3D Printer", National Conference on Undergraduate Research, Spokane, WA, April 15-19, 2015
5. Crompton, S., **Agarwal, K.**, Sealy, W., "Design of a multi material system for biomimetic materials in binder jet 3D printing", National Conference on Undergraduate Research, Spokane, WA, April 15-19, 2015
6. Doyle, M., **Agarwal, K.**, "How does Additive Manufacturing process parameters affect the material properties in Stainless steel – bronze composite?", National Conference on Undergraduate Research, Spokane, WA, April 15-19, 2015
7. Doyle, M., **Agarwal, K.**, "Additive Manufacturing of Stainless Steel for Engineering Applications", Posters on the Hill, Washington D.C., April 28-29, 2014 (One of the 60 posters selected out of 600 submissions).
8. Doyle, M., **Agarwal, K.**, "3D Printing of Stainless Steel for Applications in Engineering", National Conference on Undergraduate Research, Lexington, KY, April 3-5, 2014 (Poster)

Technical Reports

1. **Agarwal, K.**, "Lean manufacturing techniques and their implementation at PTI", Assessment report to Philips and Temro Industries, 2015
2. Shivpuri, R., **Agarwal, K**., "Novel Casting Process for developing a carbon modified Hyper-eutectic Aluminum-silicon alloy for forging wear resistant parts", Final Report to Aluminastic Corp as part of final report for SBIR Phase I project for NSF, 2012
3. Shivpuri, R., **Agarwal, K**., "Plasma Enhanced Nanostructures for improved tribology of gray cast iron stamping dies", Final Report to Advance Heat Treat as part of final report for SBIR Phase I project for NSF, 2011
4. Shivpuri, R., **Agarwal, K.,** "Microstructural modeling for on line prediction of properties in hot rolling", Final Report to Steel Authority of India, R & D Center, 2011
5. **Agarwal, K.,** Shivpuri, R., Zhu, Y., "An Inference Engine for an Intelligent Imaging System for Detecting and Eliminating Hot Rolled Defects", Submitted to O.G. Technologies as part of final report for STTR Phase II project for NSF, 2009
6. **Agarwal, K.,** Shivpuri, R., "Rapid prototyping for manufacturing of forging dies", Submitted to Forging Defense Manufacturing Consortium (FDMC), 2001

INVITED TALKS /

PRESENTATIONS

1. "Process – Property relationships in Additive Manufacturing of Nylon-Fiberglass composites using Taguchi Design of Experiments", Proceedings of Solid Freeform Fabrication Symposium, August 7-9, 2017, Austin, TX
2. "Binder Jet Additive Manufacturing of Stainless Steel - Tricalcium Phosphate biocomposite for bone scaffold applications", Proceedings of Solid Freeform Fabrication Symposium, August 7-9, 2017, Austin, TX
3. "Uncovering Innovative Partnerships for Undergraduate Research", National Conference on Undergraduate Research, Memphis, TN, April 6-8, 2017
4. "Binder Jetting in Medical Applications", Additive Manufacturing Users Group, Chicago, IL, March 21, 2017
5. "Effect of Layer Thickness and Orientation on Mechanical Behavior of Binder Jet Stainless Steel 420 + Bronze Parts", SME NAMRC, Charlotte, NC, June 11, 2015
6. "Process-Structure-Microstructure Relationship in Hot Strip Rolling of Steels Using Statistical Data Mining", 11th International Conference on Technology of Plasticity, ICTP 2014, Nagoya, Japan, October 21, 2014
7. "Manufacturing of Patient Specific Schlemms' Canal Using Fused Deposition Modeling", SME RAPID Conference, Detroit, MI, June 12, 2014
8. "Design of No-Twist-Mill Parameters for Minimized Geometric Variation in the Hot Bar Rolling of Steels", The Iron and Steel Technology Conference and Exposition, Indianapolis, IN, May 5-7, 2014
9. "Modeling of strip rolling process for process improvements", Asian Color Coated Ispat Ltd., Bawal, Rajasthan, India, Aug. 3, 2013
10. "Modeling the influence of inclusions on the performance of forged products: process design approach", 29th Forging Industry Technical Conference, Cleveland, OH, September 10-12, 2012
11. "Hierarchical Decomposition Based Approach to Process Design of Aeroengine Disk in Presence of Defects", North American Manufacturing Research Consortium (NAMRC), University of Notre Dame, South Bend, IN, June 8th, 2012.
12. **"**Role of Process Dynamics and Material Instability in the Generation of Surface Defects during High Speed Hot Extrusion of Zirconium Tubes", 10th International Conference on Technology of Plasticity, Aachen, Germany, Sept. 29, 2011
13. "Robust design of No-Twist-Mill parameters for reduced geometric variation in the hot rolling of steel rods and coils", 10th International Conference on Technology of Plasticity, Aachen, Germany, Sept. 29, 2011
14. "Multi Body based Approach using FORGE to model evolution of defects in Aeroengine Disk Forgings", FORGE Users Conference, Chicago, IL, Sept. 7th, 2011
15. "Integrated Product Process Control in Manufacturing Processes", Indian Institute of Metals, Ranchi Chapter, India, Sept. 11th, 2010
16. "Data Mining in Hot rolling of steels", Indian Institute of Metals, Ranchi Chapter, India, Sept. 14th, 2009
17. "Evaluation of PROMETAL technique for application to dies for short run forging", Conference on Solid Freeform Fabrication, Austin, TX, 2002.
18. "A Rapid Die Manufacturing Technique for Short Run Forgings", 24th Forging Industry Technical Conference, Cleveland, Ohio, October 2002.

POSTERS

1. Rupercht, J., **Agarwal, K.,** "Effect of binder saturation and sintering on stainless steel – hydroxyapatite biocomposite manufactured by 3D Printing", 18th Annual Undergraduate Research Symposium, MSU Mankato, MN, April 11, 2017
2. Hasan, M., Ndonwie, C., Bentley, M., **Agarwal, K.**, "Biocompatibility of Hydroxyapatite and Stainless Steel Alloys", MN Undergraduate Scholars Posters at St. Paul, March 17, 2016
3. Joel, T., Ludwig, H., **Agarwal, K.**, "Wear Studies during dry sliding of Stainless Steel-Bronze Composites made by Binder Jet Additive Manufacturing", 17th Annual Undergraduate Research Symposium, MSU Mankato, MN, April 20, 2015
4. White, W., Tunison, D., **Agarwal, K.**, Sealy, W., "Low Cost Welding Based Metal 3D Printer", 17th Annual Undergraduate Research Symposium, MSU Mankato, MN, April 20, 2015
5. Doyle, M., **Agarwal, K.**, "3D Printing of Stainless Steel for Applications in Engineering", 16th Annual Undergraduate Research Symposium, MSU Mankato, MN, April 21, 2014
6. Doyle, M., **Agarwal, K.**, "3D Printing of Stainless Steel for Applications in Engineering and Beyond", 3rd Minnesota Undergraduate Scholars Conference, MSU Moorhead, MN, April 14, 2014
7. **Agarwal, K.**, Shivpuri, R., "A Computational Framework for Integrated Process Design of High Performance Parts", 2nd World Congress on Integrated Computational Materials Engineering, Salt Lake City, UT, July 9, 2013
8. **Agarwal, K.,** "Role of Manufacturing processes in design for product risk", NSF CMMI Grantee Conference, Atlanta, GA, January 4-7, 2011
9. **Agarwal, K., Shivpuri, R., Ai, Xiaolan,** "Bayesian Hierarchical Network based Computational Framework for Risk Tolerant Process Design", NSF CMMI Grantee Conference, Atlanta, GA, January 4-7, 2011
10. **Agarwal, K.,** Singh, S., Shivpuri, R., "Integrated process design for next generation manufacturing", Honda Initiation Grant Symposium, Columbus, OH, July 4, 2010

INDUSTRIAL TRAINING CONDUCTED

- "Design Failure Modes and Effects Analysis", PTI Industries, Eden Prairie, MN, 2014
- "Design for Manufacturing and Assembly", PTI Industries, Eden Prairie, MN, 2014
- "Additive Manufacturing", PTI Industries, Eden Prairie, MN, 2014
- "Process Failure Modes and Effects Analysis", PTI Industries, Eden Prairie, MN, 2014
- "Additive Manufacturing", Workshop for K-12 Teachers, Community college educators and Industry personnel, Mankato, MN, 2015
- "Additive Manufacturing", Jones Metal Products, Mankato, MN, 2016
- "Lean Implementation", Jones Metal Products, Mankato, MN, 2017

FUNDING & GRANTS

Total - $1,293,829 (*External – $775,329, Internal – $57,500, Equipment & Software – $461,000)*

- *"Lean Implementation and Process Improvements"*, ($283,625), Minnesota Department of Employment and Economic Development, 2017-2018, PI
- *"3D Printing and its future in health and medicine"*, ($3,000), Douglas Moore Fellowship, Minnesota State University, Mankato, 2017-18
- *"Expert Witness services"* ($40,000), Company Confidential, 2016-17, PI

- *"Design and Manufacturing for Additive Manufacturing"*, ($77,240), Minnesota Department of Employment and Economic Development, 2016-2017, PI
- "*Design of Casting Processes for Industrial and Automotive Products",* ($7,500), William Flies Fellowship, MSU Mankato, 2015, in collaboration with LeSueur Inc, MN
- "*Develop a Certificate in Additive Manufacturing*", ($27,000), Strategic Priority Funding, Minnesota State University, Mankato, 2015-16
- "*Development of Minnesota Center of Additive Manufacturing*", ($101,000), Minnesota State College and University System, 2015
- "*Additive Manufacturing Workshop pair*", ($49,464), MN Center for Engineering and Manufacturing Excellence, 2015, Co-PI
- "*Creating a smartphone app for enhanced visual learning of Manufacturing Engineering Technology Students*", ($7,500), Presidential Teaching Scholar Fellowship, MSU Mankato, 2014
- "*Training of Workers for next generation manufacturing technologies at Philips and Temro Industries*", ($325,000), Minnesota Department of Employment and Economic Development, 2012-2015, Co-PI
- "*Design of 3D Printing-Sintering Process for Manufacturing of Bone Like Medical Implants*", ($5,000), Faculty Research Grant, MSU Mankato, 2013
- MLab 3D Printing Equipment donation by ExOne Inc. ($150,000), 2013
- "*Design of Plasma Nitriding Surface Treatment for Automotive Products*", William Flies Fellowship ($7,500), MSU Mankato, 2012, in collaboration with Advanced Heat Treat Corp., MI
- Software Donation (FORGE) from Transvalor Americas for classroom teaching and research ($210,000 for 20 licenses), 2012

PROFESSIONAL AFFILIATIONS

- Member of Society of Manufacturing Engineers (SME)
- Member of American Society of Quality (ASQ)
- Member of Association for Iron & Steel Technology (AIST)
- Member of Council of Undergraduate Research (CUR)

STUDENT ADVISING

<u>M.S Thesis Advisor</u>

- Arun Kumar Vulli, 2017, "Implementation of Kaizen at a Hearing Aid Manufacturer"
- Abhiram Reddy Ramasahayam, 2016, "Process improvement by lean thinking in trucking industry"
- Don Suranga Uduwage, 2015, "Binder Jet Additive Manufacturing of Stainless Steel-Hydroxyapatite Bio-composite"
- Cody Ingethron, 2014, "The Effects of Layer Thickness on Dry-Sliding Wear of Binder Jet Additively Manufactured Stainless Steel and Bronze Composite"
- Jason Patricka, 2013, "Lean Design process for injection molding"
- Venugopal Bonthapally, 2013, "Effect of process parameters on mechanical properties of additive manufactured parts"
- Siva Leela Sagar, 2013, "Investigation of tensile properties of porous SS 420 fabricated via 3D Printing"
- Panchut Suksrinual, 2013, "Fatigue analysis of ABS Plastic By Fused Deposition Modeling"

M.S Thesis Committee Member

- Prabin Dhital, 2016, "Study of roles of meniscus and viscous force during liquid mediated contacts separation"
- Ivan Carlos Orozco, 2016, "Design of sodium hypochlorite plant in Venezuela"
- Sasanka Kankanamge, 2015, "Air Flow and Rain Water Penetration Analysis on Generator Enclosures Using CFD Simulations"
- Christopher Reek, 2014, "The Effects of Low-Level Ethanol Blends in 4-Stroke Small Non-Road Engines"
- Rahul Patel, 2012, "Team Effectiveness and Project Management in a Student Team Environment"
- Keerthi Kalivarapu, 2012
- Jason DeMars, 2012

Undergraduate Students

- Michael Doyle
- William White
- Dominic Tunison
- Sean Crompton
- Tad Joel
- Hunder Ludwig
- John Rupercht

REVIEWER ACTIVITIES

- Journal of Intelligent Manufacturing, 2011 - Present
- ASME International Manufacturing Science and Engineering Conference (MSEC), Madison, WI, June 2013
- National Council of Undergraduate Research (NCUR), Posters on the Hill, 2014, 2015
- Scientific Committee Member and Paper Reviewer, International Conference on Technology of Plasticity (ICTP), Japan, October 2014
- International Journal of System Science, 2013 - Present
- International Journal of Computer Integrated Manufacturing, 2013 – Present
- Expert Systems with Applications, 2014 – Present
- Steel Research International, 2014 - Present
- Panel Reviewer and Lead, National Science Foundation, Small Business Innovative Research Program (NSF-SBIR), 2014
- Neural Computing and Applications, 2014 – Present
- Rapid Prototyping Journal, 2014 – Present
- Solid Freeform Fabrication Symposium (SFF), Austin, TX, 2015
- Journal of Materials Processing Technology, 2016 – Present
- Scientific Committee Member and Paper Reviewer, International Conference on Technology of Plasticity (ICTP), UK, October 2017
- Solid Freeform Fabrication Symposium (SFF), Austin, TX, 2017

SOCIETY ACTIVITIES

- Councilor (Elected), Engineering Division, Council of Undergraduate Research (CUR), 2015-2018
- NCUR Oversight Committee, Council of Undergraduate Research, 2015-2017

- Program Review Committee, Council of Undergraduate Research, 2017-2018
- Vice President, Student Chapter, The Association for Operations Management (APICS), Southern Minnesota Chapter, 2012 – Present
- Technical Committee Member, ASTM F42, "*Committee of Additive Manufacturing Technologies*", 2013 - Present

UNIVERSITY-WIDE SERVICE

- Committee, Faculty Search, Department of AMET, MSU Mankato, 2012 – 2013
- Committee, Paper Review, Regional Science Fair, MSU Mankato, 2013
- Committee, ABET Review, AMET, MSU Mankato, 2013
- Judge, Elementary School Science Fair, Mankato, MN, 2013
- Committee, International Minor in Engineering, MSU Mankato, 2013
- Organizer, Tour of Manufacturing, Greater Mankato Growth, October, 2013
- Representative from College of Science, Engineering and Technology, Undergraduate Research Center, MSU Mankato, 2014-17
- Committee, Judge and Organizer, Undergraduate Research Symposium, Minnesota State University, Mankato, 2015 - 17
- Coach, Vex IQ Robotics, Mankato Community Education and Recreation, 2016

AWARDS & HONORS

- Society of Manufacturing Engineers (SME), ***Outstanding Young Manufacturing Engineer***, 2015
- College of Science, Engineering and Technology, MSU Mankato, ***Excellence in Teaching Award***, 2014-15
- AcademicKeys Who's Who in Engineering Higher Education (WWEHE), 2014
- Travel grant ($1000) from the Forging Industry Association to present paper at Technical Conference in Cleveland, OH, September 10-12, 2012.
- NSF Student travel award to present poster at NSF CMMI Grantee Conference, Atlanta, GA, January 4-7, 2011
- Winner of $20,000 grant by All India Plastic Manufacturers Association, 2006
- Confederation of Plastic Industries (India) award for Young Entrepreneur, 2006
- Award by Govt. of India for being in Top 0.1% of the students in Math & Science in Grade 10 on All India Level
- Award by Govt. of India for highest total score in Physics, Chemistry and Mathematics (97% average) in Grade 12 on All India Level
- National Science Scholarship (Chemistry and Math) for 3 years from Grade 10 by Ministry of Science and Technology, India