

## BHASKARAN GOPALAKRISHNAN

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### EDUCATION

- Ph.D. in Industrial Engineering and Operations Research, Virginia Tech, Blacksburg, Virginia, 1988.
- M.S. in Operations Research, Southern Methodist University, Dallas, Texas, 1985.
- B.E. (Hons) in Production Engineering, College of Engineering Guindy, University of Madras, India, 1983.
- C.E.M., Certified Energy Manager, By Examination, Association of Energy Engineers, 1997-present, # 4983.
- Registered Professional Engineer (PE), West Virginia State Board of Registration for Professional Engineers, 2003-present, Registration #15546.
- Qualified AIRMaster+ (Compressed Air) Specialist and Expert by Examination, US Department of Energy (US DoE), 2004.
- Qualified PHAST (Process Heating) Specialist and Expert by Examination, US DoE, 2007.
- Qualified FSAT (Fans) Specialist by Examination, US DoE, 2009.
- Qualified SSAT (Steam Systems) Specialist by Examination, US DoE, 2011.
- Qualified PSAT Specialist (Pump Systems) by Examination, US DoE, 2012.
- LEED Green Associate by Examination, 2014.

### PROFESSIONAL EXPERIENCE

August 2003 - Full Professor with Tenure, Department of  
to present Industrial and Management Systems Engineering (IMSE),  
West Virginia University

August 2005 – Director, Industrial Assessment Center (IAC)  
to present

August 1992 – Assistant Director of IAC  
August 2005

August 2008 – Co-Director, Industries of the Future – West Virginia

August 2011	(IOF-WV) and Energy Efficiency Research Fellow, National Research Center for Coal and Energy (NRCCE), West Virginia University
August 1994 - August 2003	Associate Professor with Tenure, Department of Industrial and Management Systems Engineering, West Virginia University
August 1988 - August 1994	Assistant Professor, Department of Industrial and Management Systems Engineering, West Virginia University
July 1987 - August 1988	Graduate Project Assistant, Department of Industrial Engineering and Operations Research, Virginia Tech
January 1986 - July 1987	Graduate Teaching and Research Assistant, Department of Industrial Engineering and Operations Research, Virginia Tech
July 1985 - December 1985	Computer Aided Design Engineer, MB and Associates, California
January 1984 - May 1985	Micro-computer Laboratory Assistant, Southern Methodist University, Texas
August 1983 - December 1983	Graduate Research Assistant, Department of Mechanical Engineering, Iowa State University, Iowa
July 1982 - May 1983	Engineer in Training (Part time), Brakes India Ltd., and Best & Crompton Ltd., India

## **RESEARCH ACCOMPLISHMENTS**

- Graduated 93 graduate students (M.S. and PhD) under my guidance.
- Currently supervising Ph.D. and M.S students.

### **Funded research projects**

1. Principal Investigator, (PI), Evaluation of the Energy Efficiency of the Blower Heater Non-Purge Desiccant Compressed Air Dryer, Hana Plant in South Korea, 2017 – 2019, \$55,000
2. Principal Investigator (PI), Energy Efficiency for Maryland State Buildings, Maryland Energy Administration, 2013, \$65,000.
3. Co-PI, Advancing an Interdisciplinary and Competitive Bioenergy Research Team at WVU, West Virginia University, 2011-2012, \$179,500.
4. Principal Investigator (PI) and Director, Industrial Assessment Center (IAC) – Energy, Waste, and Productivity Assessments for Manufacturing Facilities, US DoE funding, 1992-2021, \$ 5,665,000.

5. PI, Energy Efficiency Training and Climate Mitigation Research in China, Lawrence Berkeley National Laboratory and Oakridge National Laboratory, US DoE, 2010-2011, \$ 60,000.
6. PI, Save Energy Now (SEN) Project, US DoE/WVOE (West Virginia Office of Energy) funding, 2008-2009, \$ 50,000.
7. PI, Energy Assessments for West Virginia Industries of the Future (IOF), WVOE funding, 2008-2012, \$ 350,000.
8. PI, Energy Assessments, Industrial and Buildings Workshops, Lean Review, Benchmarking, and Carbon Footprint Analysis for Small Rural Businesses in WV, Sustainable Manufacturing through E3: Economy, Energy and Environment Initiative, EPA, USDA, WVDEP and WVOE funding, 2008-2021, \$ 1,045,944.
9. PI, Energy Efficiency for Buildings, WVOE funding, 2010-2013, \$150,000.
10. Co-PI, Market Transformation for EERE Technologies through State and Multi-State Implementation of Clean Energy Standard Offer Programs, WVOE funding, 2009-2011, \$ 50,000.
11. PI, Development of a Regional Assessment/Implementation SEN Delivery System Partnership, US DoE/WVOE funding, 2009-2013, \$ 1,458,431.
12. Co-PI, Biomass Plant Layout and Feedstock Supply, RDS, LLC, National Energy Technology Laboratory funding, 2009-2010, \$ 100,000.
13. PI, Enhancement of GEPDSS model in Continuous Galvanizing Lines for Increased Productivity - ILZRO (International Lead Zinc Research Organization) funding, 2008-2013, \$ 110,000.
14. PI, Plant Wide Energy Assessment for PPG Industries, US DoE/PPG Inc funding, \$ 100,000, 2005-2007.
15. Co-PI, Improving Quality and Utilization of Upland Hardwoods in the Appalachian Region, USDA/CSREES funding, 2004-2010, \$ 660,000.
16. PI, Energy Assessments for West Virginia Industries of the Future (IOF), West Virginia Development Office (WVDO) funding, 2002-2008, \$ 375,000.
17. Co-PI, Life Improvement of Pot Hardware in Continuous Steel Hot Dipping Processes, US DoE funding, 2001-2005, \$ 1,188,000.
18. Co-PI, Multifunctional Metallic and Refractory Materials for Energy Efficient Handling of Molten Metals, US DoE funding, 2004-2007, \$ 655,000.
19. PI, Energy Validation Task for the IMF Project, UT-Battelle (ORNL) funding, 2004-2007, \$ 30,000
20. Co-PI, Industries of the Future-West Virginia (IOF-WV) Special Projects Submission, US DoE/WVDO funding, 2002-2007, \$ 300,000.

21. Co-PI, Industries of the Future Plant Wide Energy Efficiency Opportunity Assessment at the Bayer Corporation Plant, New Martinsville, WV, US DoE funding, 2001-2003, \$ 85,960.
22. Co-PI, Outreach Strategies to Promote State-Level Partnerships that Expand Participation in Industries of the Future, US DoE funding, 2001- 2002, \$ 50,000.
23. Co-PI, Wood Industry Assistance Program – Energy Assessments for Wood Processing Facilities, US DoE/WVDO funding, 2000-2008, \$ 325,000.
24. Co-PI, FEMP US Bureau of Engraving and Printing - Energy Assessment, US DoE funding, 2001-2002, \$ 11,150.
25. Co-PI, Industries of the Future-West Virginia (IOF-WV) Special Projects Submission, US DoE/WVDO funding, 1999-2001, \$ 185,000.
26. Co-PI, Product Design for Worker Safety and Health (TEXPERT), National Environmental Education and Training Center (NEETC) funding, \$ 1,620,310, 1998-2003.
27. PI, Evaluation of Multi-Product Interactions for Southern Appalachian Hardwood Stands, United States Department of Agriculture, Forest Service (USDA) funding, \$ 10,000, 1998-99.
28. PI, Evaluation of Materials for Use in Zn-Al Liquid Metal Coating Systems, Lockheed Martin Energy Research Corporation – Oak Ridge National Laboratory funding, \$ 54,391, 1998-99.
29. PI, Plastics Recycling: Knowledge Engineering for Enabling Expert Systems Development, DN American Inc funding, \$ 15,000, 1998-99.
30. PI, Design Stage Recognition and Evaluation of Worker and Environmental Safety and Health (TEXPERT), NEETC funding, \$ 251,498, 1997-98.
31. Co-PI, Projects for Positive Effect on Energy Efficiency and the Environment, Pennsylvania Department of Environmental Protection funding, \$ 67,250, 1997-99.
32. Co-PI, Industries of the Future - West Virginia Support Program, US DoE/WVDO funding, \$ 100,000, 1997-99.
33. Co-PI, Industrial Assessments for WV Glass Plants, WVDO funding, \$ 50,000, 1996-98.
34. PI, Development of an Expert System for Hardwood Group Selection, USDA Forest Service funding, \$ 21,000, 1994-98.
35. PI, Expert Systems for Industrial Waste Minimization, National Research Center for Coal and Energy (NRCCE) funding, \$ 30,000, 1995-97.
36. PI, Computer Based Forest Stand Management Incorporating Wildlife Impacts, USDA Forest Service funding, \$ 25,000, 1994-96.

37. PI, Design and Development of Expert Systems for Energy Analysis and Diagnostics: Energy Self-Assessment for Industries (ENERGEX), US DoE funding, \$ 50,000, 1994-95.
38. PI, Expert Systems for Energy Analysis and Diagnostics in Manufacturing Industries (ENERGEX), NRCCE funding, \$ 45,000, 1993-95.
39. PI, Expert Systems for Forest Stand Management, USDA Forest Service funding, \$ 37,000, 1992-94.
40. PI, A Machine Learning Model for Robotic Applications, NASA/WV Space Grant Consortium, \$ 10,000, 1992-93.
41. Co-PI, Machinability Analysis of Product Designs in Concurrent Engineering, DARPA Initiative in Concurrent Engineering (DICE), US Department of Defense funding, \$ 172,000, 1988-91.

## **PUBLICATIONS**

### **Peer-reviewed Journal Articles and Book Chapters**

1. Al-Shebeeb, O., Gopalakrishnan, B., Currie, K., Wuest, T., Analysis of the Synergistic Integration of DFMT with CAPP and MP in Metal Parts Manufacturing based on Cost Analysis and Systematic Algorithm, *International Journal of Manufacturing Research*, in press, 2021.
2. Kianpour, P., Gupta, D.P., Krishnan, K.K., Gopalakrishnan, B., Optimizing Unrelated Parallel Machine Scheduling in Job Shops With Maximum Allowable Tardiness Limit, *International Journal of Industrial and Systems Engineering*, Vol. 37, No. 3, 2021.
3. Omar Al-Shebeeb, Bhaskaran Gopalakrishnan, Dayakar Devaru, Evaluating the Influence of Energy Consumption on Process Plan Attributes: Process Plans Indexing Based on Electrical Demand and Energy Consumption, *Handbook of Research on Advancements in Manufacturing, Materials, and Mechanical Engineering*, Chapter in the book edited by Dr. Leonid Burstein, IGI Global, DOI:10.4018/978-1-7998-4939-1.ch005, 2021.
4. Mandlem, K., Gopalakrishnan, B., Nimbarte, A., Mostafa, R., Das, R., Energy Efficiency of Smart Thermostat Based BEMS, *Energy Engineering*, Tech Science Press, Vol. 117, No. 4, 2020.
5. Devaru, D.G., Gopalakrishnan, B., Regression Model to Estimate Electrical Energy Consumption of Lumber Sawing Based on Product, Process, and System Parameters, *Energy Efficiency Journal*, Volume 13, No.8, pp. 1799-1824, October 2020.
6. Botts, A., Gopalakrishnan, B., Nimbarte, A., Currie, K., Karki, V., Energy Efficiency of Blower Heater Non-Purge Compressed Air Dryers, *International Journal of Energy Technology and Policy*, in press, 2020.
7. Devaru, D.G., Maddula, R., Gopalakrishnan, B., Establishing and Comparing

- Electrical Energy Consumption of Sawmills, *International Journal of Applied Management Science*, Vol.12, No.1, pp.23-49, 2020.
8. Smith, N., Nimbarte, A., Gopalakrishnan, B., Wuest, T., Real-time Energy Visualization System for Light Commercial Businesses, *Sustainable Energy Technology and Assessments Journal*, Vol.34, pp.68-76, August 2019.
  9. Chowdhury, S.K., Nimbarte, A.D., Hsiao, H., Gopalakrishnan, B., and Jaridi, M., A Biomechanical Shoulder Strain Index Based on Stabilizing Demand of Shoulder Joint, *Journal of Ergonomics*, pp. 1657-1670, 2018.
  10. Kanneganti, H., Gopalakrishnan, B., et al., Specification of Energy Assessment Methodologies to Satisfy ISO 50001 Energy Management Standard, *Sustainable Energy Technology and Assessments*, Vol. 23, pp. 121-135, 2017.
  11. Latif, H., Gopalakrishnan, B., Nimbarte, A., Currie, K., Sustainability Index Development for Manufacturing Industry, *Sustainable Energy Technology and Assessments*, Vol. 24, pp. 82-95, 2017.
  12. Abolhassani, A., Harner, J., Jaridi, M., Gopalakrishnan, B., Productivity Enhancement Strategies in North American Automotive Industry, *International Journal of Production Research*, pp.1-18, August 2017.
  13. Kaiser, J., Nimbarte, A., Davari, D., Gopalakrishnan, B., He, X., Study of Skin Conductance and Perceived Discomfort of the Hand/Finger System Under Controlled Atmospheric Conditions, *Theoretical Issues in Ergonomic Science*, Vol. 18, No. 5, pp. 442-454, 2017.
  14. Al-Shebeeb, O., Rangaswamy, S., Gopalakrishnan, B., Devaru, D., Evaluation and Indexing of Process Plans Based on Electrical Demand and Energy Consumption, *International Journal of Manufacturing, Materials, and Mechanical Engineering*, Vol. 7, Issue: 3, pp. 1-19, July- September 2017.
  15. Abolhassani, A., Layfield, K., Gopalakrishnan, B., Lean and US Manufacturing Industry: Popularity of Practices and Implementation Barriers, *International Journal of Productivity and Performance Management*, Vol. 65, Issue 7, pp. 875 – 897, 2016.
  16. Sundaramoorthy, S., Quang, P., Gopalakrishnan, B., Latif, H., Heat Balance Analysis of Annealing Furnaces and Zinc Pot in Continuous Hot Dip Galvanizing Lines, *Energy Engineering Journal*, Vol. 113, No. 2, pp. 12- 47, 2016.
  17. Devaru, D., Banuri., Gopalakrishnan, B., Halabe, U., Latif, H., Feasibility Analysis for Implementing GPR Scanning System in Sawmills for Productivity Improvement, *International Journal of Advances in Management Science*, Vol. 4, No. 1, pp. 1-15, July 2015.
  18. Devaru, D.G., Maddula R., Grushecky, S., Gopalakrishnan, B., Motor- Based Energy Consumption in West Virginia Sawmills, *Forest Products Journal*, Vol. 64, No. ½, pp. 33-40, 2014.

19. Gopalakrishnan, B., Gupta, D.P., Chaudhari, S., The Effect of System Storage on the Performance Profile of Rotary Screw Air Compressors, *Energy Engineering Journal*, Vol. 111, No. 4, pp. 25-33, 2014.
20. Gopalakrishnan, B., Ramamoorthy, K., Crowe, E., Chaudhari, S., Latif, H., A Structured Approach for Facilitating the Implementation of ISO 50001 Standard in the Manufacturing Sector, *Sustainable Energy Technologies and Assessments Journal*, Vol. 7, pp. 154–165, 2014.
21. Munisamy, A., Gopalakrishnan, B., Chaudhari, S., Jaridi, M., Crowe, E., Gupta, D.P., A Computer Based Total Productive Maintenance Model for Electrical Motors, *International Journal of Productivity and Quality Management*, Vol.13, No.2, pp.178 – 200, 2014.
22. Chaudhari, S., Gupta, D., and Gopalakrishnan, B., Using IAC Database for Longitudinal Study of Small to Medium Sized Automotive Industry Suppliers' Energy Intensity Changes, *SAE International Journal of Materials and Manufacturing*, Vol. 6, No. 3, pp. 427-435, 2013.
23. Alkadi, N.E., Gopalakrishnan, B., Chaudhari, S., Product Design for Energy Reduction in Concurrent Engineering: An Inverted Pyramid Approach, *International Journal of Industrial and Systems Engineering*, Vol.15, No. 1, pp. 90-117, 2013.
24. Gopalakrishnan, B., Mardikar, M., Gupta, D.P., Jalali, S., Chaudhari, S., Establishing Baseline Electrical Energy Consumption in Wood Processing Sawmills: A Model Based on Energy Analysis and Diagnostics, *Energy Engineering Journal*, Vol. 109, No. 5, pp. 40-80, 2012.
25. Lin, W., Wang, J., Grushecky, S.T., Summerfield D., Gopalakrishnan, B., Energy Consumption and Efficiency of Appalachian Hardwood Sawmills, *Forest Products Journal*, Vol. 62, No. 1, pp. 32-38, 2012.
26. Chaudhari, S., Gupta, D.P., Gopalakrishnan, B., Investigation of Relationship between System Efficiency Curve and Measurement and Verification (M&V) of Energy Savings, SAE, *International Journal of Materials and Manufacturing*, Vol. 4 No. 1 pg. 486-494, June 2011.
27. Halabe, U., Gopalakrishnan, B., Jadeja, J., Advanced Lumber Manufacturing Model for Increasing Yield in Sawmills Using GPR Based Defect Detection Systems, *International Journal of Advanced Manufacturing Technology*, Vol. 56, pp. 649–661, 2011.
28. Gupta, D.P., Gopalakrishnan, B., Chaudhari, S., Jalali, S.M., Development of an Integrated Model for Process Planning and Parameter Selection for Machining Processes, *International Journal of Production Research*, ISSN 0020–7543 print/ISSN 1366–588X online, Taylor and Francis, Vol. 49, Issue 21, pp. 6301-6319, 2011.
29. Gopalakrishnan, B., Gajera, D., Athinarayanan, R., Chaudhari, S., Process Costing of the Microchip, *International Journal of Industrial and Systems Engineering*, Vol. 8, No. 3, pp. 326-345, 2011.

30. Gerdes, K., Fuller, J.A., Gopalakrishnan, B., Gupta, D.P., Energy Supply Concerns: A United States Perspective on Electric Power Generation, *Energy Studies Review*, Vol. 17, No. 1, 2010.
31. Gopalakrishnan, B., Chavan R., Gupta, D.P., Alkadi, N., Energy Consumption Modeling and Benchmarking in Continuous Galvanising Lines, *International Journal of Energy Technology and Policy*, Vol. 7, No. 3, 2010.
32. Gopalakrishnan, B., Mardikar, M., Korakakis, D., Energy Analysis in Semi-Conductor Manufacturing, *Energy Engineering Journal*, Vol. 107, No. 2, pp. 6-40, 2010.
33. Gupta, D.P., Gopalakrishnan, B., Energy Sensitive Machining Parameter Optimisation, *International Journal of Industrial and Systems Engineering*, Vol. 5, No. 4, pp.405-423,2010.
34. Halabe, U.B., Agrawal, S., Gopalakrishnan, B., Nondestructive Evaluation of Wooden Logs using Ground Penetrating Radar, *Nondestructive Testing and Evaluation*, Vol. 24, No. 4, pp. 329-346, December 2009.
35. Devaru, D., Halabe, U., Gopalakrishnan, B., Agrawal, S., Ground Penetrating Radar (GPR) Based System for Non-Destructive Detection of Interior Defects in Wooden Logs, *International Journal of Manufacturing Research*, Vol. 3, No. 4, pp. 425-451, 2008.
36. Gopalakrishnan, B., McCoy, M., Adaptive Process Control for Turning Operation using Expert System, *International Journal of Industrial and Systems Engineering*, Vol. 3, No. 6, 2008.
37. Gopalakrishnan, B., Chandrasekharan, A., Maintenance Risk Reduction for Effective Facilities Management, *Journal of Facilities Management*, Vol. 6, No. 1, 2008.
38. Gopalakrishnan, B., Gupta, D., Insulation Recommendations for Manufacturing Facilities From An Industrial Assessment Center, *Insulation Outlook, The Official Journal of the National Insulation Association*, Vol. 52, No. 5, pg. 4-8, June 2007.
39. Gopalakrishnan, B., Jaraiedi, M., Iskander, W., Ahmad, A., Tolerance Synthesis Based on Taguchi Philosophy, *International Journal of Industrial and Systems Engineering*, Vol. 2, No. 3, 2007.
40. Gopalakrishnan, B., Gupta, D.P., Mardikar, Y., Chaudhari, S., Industrial Energy Efficiency, *Handbook of Environmentally Conscious Manufacturing*, John Wiley & Sons, Inc., March 2007.
41. Gopalakrishnan, B., Banta, L., Bhave, G., Modeling Steam Based Energy Supply Chain in an Integrated Steel Manufacturing Facility: A Simulation Based Approach, *International Journal of Industrial and Systems Engineering*, Vol.2, No. 1, pp.1-29,2007.
42. Gopalakrishnan, B., Kokatnur, A., Gupta, D. P., Design and Development of a Target-Costing System for Turning Operation, *Journal of*

- Manufacturing Technology Management*, Vol. 18, No.2, pp. 217-238, 2007.
43. Gopalakrishnan, B., Chaudhari, S., Famouri, P., Plummer, R. W., Facilitation for Load Based Energy Savings in Three Phase Squirrel Cage Induction Motors, *Energy Engineering Journal*, Vol. 103, No. 6, pg. 37-64, Oct - Nov 2006.
  44. Gopalakrishnan, B., Mate, A., Mardikar, Y., Gupta, D., Plummer, R., Anderson, B., Energy Efficiency Measures in the Wood Manufacturing Industry, *Proceedings of the 2005 ACEEE (American Council for an Energy Efficient Economy) Summer Study on Energy Efficiency in Industry on CD ROM*, ISBN 0-918249-54-6, West Point, New York, July 2005.
  45. Winn, G., Gopalakrishnan, B., Premkumar, R., Alkadios, M., What Safety Managers must know about Independent Validation and Verification of Software, *Professional Safety, Journal of the American Society of Safety Engineers*, Vol. 50, No. 8, pp. 45-52, 2005.
  46. Gopalakrishnan, B., Selvaraj, R., Turton, R., Plummer, R. W., Sukumar, S., A Systems Approach to Plant-Wide Energy Assessment, *Energy Engineering Journal*, Volume 102, No. 5, pp.49-80, 2005.
  47. Gopalakrishnan, B., Tirunellayi, S., Todkar, R., Design and Development of an Autonomous Mobile Smart Vehicle: A Mechatronics Application, *Mechatronics*, Vol. 14, pp.491-514, 2004.
  48. Gopalakrishnan, B., Turuvekere, R., Gupta, D.P., Computer Integrated Facilities Planning and Design, *Facilities*, Vol. 22, No. 7/8, 2004.
  49. Gopalakrishnan, B., Insulation's Effectiveness in Industrial Facilities, *Insulation Outlook, The Official Journal of the National Insulation Association*, Vol. 48, No. 11, November 2003.
  50. Gopalakrishnan, B., Plummer, R.W., Iskander, W.H., A Comparative Study on Energy Assessment Data from Manufacturing Industry, *Proceedings of the 2003 ACEEE (American Council for an Energy Efficient Economy) Summer Study on Energy Efficiency in Industry on CD ROM*, ISBN 0-918249-52-X, Rye Town, New York, July 2003.
  51. Gopalakrishnan, B., Weng, Li, Gupta, D.P., Facilities Design using a Split Departmental Layout Configuration, *Facilities*, Vol. 21, No. 3/4, pp. 66-73, 2003.
  52. Gopalakrishnan, B., Reddy, V.K., Gupta, D.P., Neural Network for Estimating the Tool Path Length in Concurrent Engineering Applications, *Journal of Intelligent Manufacturing*, Vol. 15, Number 1, pp. 5-15, 2004.
  53. Gopalakrishnan, B., Plummer, R.W., Kulkarni, R., Mangalampalli, P., Solvent and Paint Waste Reduction using WASTEX: An Expert System for Industrial Waste Minimization, *Journal of Environmental Systems*, Vol. 29, Issue. 1, pp. 39-53, 2002.
  54. Gopalakrishnan, B., Yoshii, T., Dappili, S.M., Decision Support System for

- Machining Center Selection, *Journal of Manufacturing Technology Management*, Vol. 15, Number. 2, pp.144-154,2004.
55. Winn, G., Gopalakrishnan, B., Becker, P.E., Carr, M., Black, D.C., Chittibabu, S., Rajaarunprasad, P., TEXPERT: A Tool for Safety Professionals & Design Engineers, *Professional Safety, Journal of the American Society of Safety Engineers*, 2002.
  56. Gopalakrishnan, B., ENERGEX: An Expert System for determining Industrial Energy Efficiency, material in chapter titled *Artificial Intelligence and Knowledge Management Systems*, chapter author R.L. Routh, *Maynard Industrial Engineering Handbook*, Kjell B. Zandin, Editor, McGraw Hill, pg. 12.69-12.70, 2002.
  57. Gopalakrishnan, B., R.W. Plummer, N.M. Alkadi, Analysis of Energy Conservation Opportunities in Glass Manufacturing Facilities, *Energy Engineering*, Journal of the Association of Energy Engineers, Vol. 98, No. 6, pp. 27-49, 2001.
  58. Reynold Franklin, Udaya B. Halabe, Gopalakrishnan, B., Knowledge Based Assistant for Ultrasonic Testing Methodology of Metals, *Materials Evaluation*, Vol. 59, No. 12, pp. 1399-1405, December 2001.
  59. Gopalakrishnan, B., R.W. Plummer, N.M. Alkadi, Comparison of Glass Manufacturing Facilities based on Energy Consumption and Plant Characteristics, *Journal of Energy and Development*, Vol. 27, No. 1, pp. 101-115, Autumn 2001.
  60. Gopalakrishnan, B., Plummer, R.W., and Nagarajan, S., ENERGEX: Expert Systems for Industrial Energy Conservation and Management, *Energy Engineering*, Journal of the Association of Energy Engineers, Vol. 94, No. 2, pp. 58-79, 1997.
  61. Gopalakrishnan, B., *Product Design and Process Planning in Concurrent Engineering, Textbook Publication*, International Society for Productivity Enhancement, ISBN: 1-879727-00-5, 1996.
  62. Gopalakrishnan, B., Adhikari, S., Chintala, S., and Bhaskaran, G., Design for Effective Product Storage and Distribution in Concurrent Engineering, *Design for X: Concurrent Engineering Imperatives*, chapter in the book edited by Dr. George Huang, Chapman and Hall, pp. 230-244, 1996.
  63. Gopalakrishnan, B., Srinath, S., and Fultz, B., A Machine Learning Model for Robot Kinematics and Motion Task Planning for Mechanical Assembly Applications, MS94-198, *SME Transactions on Robotics Research*, pp. 1-11, 1995.
  64. Gopalakrishnan, B., and Pandiarajan, V., Computer Numerically Controlled Machining of Complex Geometries in Concurrent Engineering, *Journal of Design and Manufacturing*, Vol. 3, pp. 45-55, 1993.
  65. Gopalakrishnan, B., and Pandiarajan V., Materials and Manufacturing Processes Selection System for Product Designs in Concurrent Engineering,

- Journal of Materials Processing Technology*, Vol. 28, Nos. 1,2, pp. 93-103, September 1991.
66. Gopalakrishnan, B., and Al-Khayyal, F., Machine Parameter Selection for Turning with Constraints: An Analytical Approach based on Geometric Programming, *International Journal of Production Research*, Vol. 29. No. 9, pp. 1897-1908, September 1991.
  67. Gopalakrishnan, B., Expert-systems-based Evaluators: Applications in Design for Manufacturing, *Journal of Advanced Manufacturing Engineering*, Vol. 2, No. 2, pp. 189-194, October 1990.
  68. Gopalakrishnan, B., and Pandiarajan, V., Expert Systems for Machining Parameter Selection: Design Aspects, *Journal of Advanced Manufacturing Engineering*, Vol. 2, No. 2, pp. 59-63, April 1990.
  69. Gopalakrishnan, B., Computer Integrated Machining Parameter Selection in a Job Shop using Expert Systems, *Journal of Mechanical Working Technology*, Vol. 20, No. 3, September 1989.

#### **Peer Reviewed Conference Papers and Other Articles**

1. Al-Shebeeb, O., Gopalakrishnan, B., Influence of Materials Properties on Process Planning Effectiveness, SAE Technical Paper, *Proceedings of the SAE World Congress*, Detroit, MI, April 2017.
2. Al-Shebeeb, O., Gopalakrishnan, B., Computer Aided Process Planning Approach for Cost Reduction and Increase in Throughput, *Proceedings of the International Conference on Industrial Engineering and Operations Management*, Detroit, MI, September 2016.
3. Gopalakrishnan, B., Mahareddy, M., Abolhassani, A., Nimbarte. A., Energy profiling Analysis of Energy Assessments for Buildings Associated with Small Businesses, *Proceedings of the 9th International Conference Improving Energy Efficiency in Commercial Buildings and Smart Communities (IEECB&SC'16)*, Frankfurt, Germany, 2016.
4. Gopalakrishnan, B., Jalali, S.M., Chaudhari, S., Gupta D.P., Crowe. E., Design and Development of an Energy Efficiency Knowledge Center, *Proceedings of ICINCO 2014*, Vienna, Austria, September 2014.
5. Bhadra, S., Gopalakrishnan, B., Chaudhari, S., Energy Efficiency in Continuous Galvanizing Lines, *Proceedings of the International Renewable and Sustainable Energy Conference (IRSEC'13)*, Ouarzazate, Morocco, March 2013.
6. Crowe, E., Gopalakrishnan, B., Adolphson, G., Biser, G., Cullen, K., A Collaborative Approach to Sustainability: A Case Study of West Virginia Sustainable Communities, *Proceedings of the World Energy Congress*, Association of Energy Engineers, Atlanta, GA, 2012.
7. Gopalakrishnan, B., Gump, C.D., Gupta, D.P., Chaudhari, S.A., Development of a Software System to Facilitate Implementation of Coal and

- Wood Co-Fired Boilers, *Proceedings of the Industrial Energy Technology Conference*, New Orleans, LA, May 2012.
8. Gopalakrishnan, B., Gupta, D.P., Bitar, A., Analysis of Compressed Air and Process Heating Systems – A Case Study from Automotive Parts Manufacturer in Mexico, *Proceedings of the Society of Automotive Engineers World Congress*, Detroit, MI, 2012.
  9. Crowe, E., Gopalakrishnan, B., Cullen, K., Chaudhari, S., Results of an Enhanced Save Energy Now (SEN) Energy Assessment, A Case Study of a Steel Mini-Mill, *Proceedings of the Industrial Energy Technology Conference*, New Orleans, USA, May 2011.
  10. Cullen, K., Crowe, E., Gopalakrishnan, B., Chaudhari, S., Energy Efficiency Programs in West Virginia: A Partnership Approach, *Proceedings of the Industrial Energy Technology Conference*, New Orleans, USA, May 2011.
  11. Cullen, K., Crowe, E., Gopalakrishnan, B., Chaudhari, S., Save Energy Now Regional Partnership: Advancing Energy Productivity through Government, Industrial, and University Collaboration, *Proceedings of the ACEEE Summer Study on Energy Efficiency in Industry*, Niagara Falls, USA, 2011.
  12. Gopalakrishnan, B., Koonamodi, V., Sundaramoorthy, S., Chaudhari, S., Multivariable Efficiency Evaluation of Boilers, *Proceedings of the International Conference on Thermal Energy and Environment*, Kalasalingam University, India, 2011.
  13. Chaudhari, S., Gupta, D.P., Gopalakrishnan, B., Investigation of Relationship between System Efficiency Curve and Measurement and Verification (M&V) of Energy Savings, *Proceedings of the Society of Automotive Engineers World Congress*, Detroit, Michigan, 2011.
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  49. Gopalakrishnan, B., and Pathak, M., Machine Parameter Selection and Cost Estimation Techniques: Applications in Concurrent Engineering, *Proceedings of the Manufacturing International Conference*, (MI'92), SME, Dallas, TX, 1992.
  50. Gopalakrishnan, B., and Song, J., Machine Learning Models for Machining Process Planning, *Proceedings of the Flexible Automation and Information Management Conference*, Washington, D.C., 1992.
  51. Gopalakrishnan, B., An Educational Perspective on Product Design for Manufacturing, *Proceedings of the IBM Academic Computing Conference*, Dallas, TX, 1991.
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53. Gopalakrishnan, B., and Pandiarajan, V., Feature Based Machining Analysis and Cost Estimation for the Manufacture of Complex Geometries in Concurrent Engineering, ***Proceedings of the Fifth International Conference on CAD/CAM, Robotics, and Factories of the Future***, ISPE, Norfolk, VA, December 1990.
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56. Gopalakrishnan, B., and Pandiarajan, V., Product Design for Manufacturing: The Use of Knowledge Based Systems in Concurrent Engineering, ***Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics***, Los Angeles, November 1990.
57. Gopalakrishnan, B., Expert Systems Based Machining Process Evaluation and Selection in Concurrent Engineering, ***Proceedings of the 2nd Annual Symposium on Mechanical System Design in a Concurrent Engineering Environment***, Iowa City, October 1990.
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## **COURSES TAUGHT**

**Student Evaluation of Instruction (SEI) scores predominantly between 4 (good) and 5 (excellent) for all courses taught. Refer to website for details.**

- Energy Efficiency and Sustainability
- Expert Systems in Manufacturing
- Engineering Economy
- Design of Dynamic Materials Systems
- Facilities Planning and Materials Handling
- Computer Aided Process Planning
- Advanced Production Control
- Materials and Costing
- Advanced Engineering Economy
- Engineering Management
- Production Planning and Control
- Manufacturing Processes
- Computer Applications

## **TRAINING ACTIVITIES**

- Industrial and Buildings Energy Efficiency, Beijing, China, 2010 and 2011.
- Energy Management Practices by SME, for IEA on behalf of US DoE, Guilin, China, 2015.
- Energy Efficiency in Compressed Air Systems, Compressed Air Challenge, 2013-2017.
- Fundamentals of Steam Systems, for SEI of National Environment Agency (NEA), Singapore, 2017.
- Industrial Waste Heat Recovery, for SEI of National Environment Agency (NEA), Singapore, 2018.
- Professional Sharing Series Lecture, for SEI of National Environment Agency (NEA), Singapore, 2018.

## SERVICE ACCOMPLISHMENTS

- ABET Coordinator for the BS Industrial Engineering program in the IMSE Department since 2000. Coordination of all data collection, working with faculty and students to prepare outcome-based assessment documentation for accreditation by ABET. Successful in enabling ABET 6-year accreditation (without any weaknesses or deficiencies) for the BS IE program in 2003, 2009, and 2015.
- Member of the IEnMP Board of Directors, 2017 to present.
- Invited presentation on “Continuous Improvement in Sustainability through Energy Efficiency”, IRSEC’13 Conference, Morocco, March 2013.
- Member of FE Examination Review Panel for Industrial Engineering, NCEES, Clemson, SC, 2006 - present.
- Chair of FE Examination Review Panel for Industrial Engineering, NCEES, Clemson, SC, 2010 - 2013.
- Member of the PE Examination Review Panel for Industrial Engineering, NCEES, Clemson, SC, 2012-present.
- Member of International Advisory Committee, Kalasalingam University, India, 2011.
- Invited member of the Editorial Board, International Journal of Energy Technology and Policy, 2009-present.
- Energy Assessments Team Leader, West Virginia Industries of the Future Program (IOF-WV), WVU.
- International energy assessment activities: China (2007), Sweden (2009).
- Responsible for submission and grading PhD qualifying examination questions for IENG 343 (Production Planning and Control).
- Evaluator of graduate program applications for IMSE department.
- Program Committee Member, International Conference on Informatics in Control, Automation, and Robotics, 2011, 2012, 2013, 2014, 2015, 2016, 2017.
- Invited as special guest, Inauguration of the International Conference on Thermal Energy and Environment, Kalasalingam University, 2011.
- Member, Technical Program Committee and Session Chair, Sustainable and Energy Efficient Manufacturing, Sustainable Materials and Components, SAE World Congress, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016.

- Member, Technical Program Committee, Vehicle Electrification Strategies for Sustainability, SAE World Congress, 2017, 2018.
- Conference Chairman, Intelligent Systems in Design and Manufacturing Conference, Society of Photo Optical Instrumentation Engineers (SPIE), Boston, for the years 1997, 1998, 1999, 2000, 2001, 2003, 2004, and 2005.
- Editor of Proceedings, Intelligent Systems in Design and Manufacturing Conference, SPIE, Boston, 1997, 1998, 1999, 2000, 2001, 2003, 2004, and 2005.
- Member of Program Committee, Data Mining Conference, SPIE, Boston, 2006.
- Member of Program Committee, Internet-Based Enterprise Integration and Management Conference, SPIE, Boston, 2001.
- Paper reviewer for various international research journals, such as International Journal of Production Research, Journal of Manufacturing Science and Engineering, Computers and Industrial Engineering, Engineering Economics.
- Invited by the Society of Manufacturing Engineers to be a technical advisor on manufacturing engineering to government agencies and industries since 1994.
- Past member, IIE, AEE, SME

## **COMMITTEES SERVED AND OTHER ACTIVITIES**

- Chair, member, departmental promotion and tenure committee.
- Member, college promotion and tenure committee.
- Chair, member, department undergraduate curriculum committee.
- Member, college undergraduate curriculum committee.
- Member, college strategic planning committee on undergraduate curriculum.
- Member, college task force on research planning and management.
- Member, college task force on College Relations and Communications.
- Member, college computer committee.
- Member, college library committee.
- Member, department computer committee.
- Member, department IIE student advisory committee.
- Member, department faculty search committee.
- Department representative for United way campaign.
- Member of search committee to select Chairman of IMSE.

- Member, CEMR Undergraduate Academic Affairs Committee.
- Member, CEMR AdHoc ABET program committee.
- ABET program coordinator for IMSE department.
- Undergraduate program coordinator for IMSE department.

## **HONORS AND AWARDS**

- Outstanding Graduate Teacher Award, College of Engineering, West Virginia University.
- Member, Tau Beta Pi.
- Member, Omega Rho - Operations Research Honor Society.
- Member, Alpha Pi Mu - Industrial Engineering Honor Society.
- Tag Award for outstanding undergraduate student.
- Jawaharlal Nehru Award for outstanding undergraduate student.