

CURRICULUM VITAE

Fantahun M. Defersha, Ph.D., P.Eng.

Associate Professor

in the

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JESUS ANSWERED, "I AM THE WAY AND THE TRUTH AND THE LIFE. NO ONE COMES TO THE FATHER EXCEPT THROUGH ME". (John 14:6)

OBJECTIVE

- ◇ To contribute analytical and computational skills and experience in modeling, meta-heuristics, parallel computing, computer simulation in the areas of manufacturing systems design, production planning and scheduling, logistics, quality management, productivity and cost analysis to the academia and practitioners and deliver the state-of-the-art knowledge to students at various levels in mechanical and industrial engineering.

PERSONAL PROFILE

- ◇ 2006 PhD graduate from Concordat University, Montreal, Quebec, CANADA;
- ◇ Computer literate in: multiple programming languages (C++/C#/Visual Basic); applications softwares (Minitab, L^AT_EX, Excel, PowerPoint, Ms-Word); simulation package (ARENA); optimizations packages (LINGO and CPLEX); CadCam Packages (AutoCAD, SolidWorks, MasterCam); and Parallel Computing using Message Passing Interface (MPI);
- ◇ Rising professional in operations research and manufacturing systems with experience in mathematical modeling, meta-heuristics, industrial systems simulation, and parallel computing;
- ◇ Author and co-author for several refereed journals articles in production and operations management fields;
- ◇ More than five years experience in university teaching in Ethiopia as a lecturer with high scores in students' evaluations (1995-2002); Seven years academic experience as a PhD Student, Research Assistant, Research Associate, and Part-time Faculty at Concordia University, Montreal Quebec, Canada (2002-2009); and research and teaching experience as an Assistant Professor (2010 to 2015) and then as a Tenured Associate Professor (2015 to date) at University of Guelph, Ontario, Canada.
- ◇ Research Interest: Manufacturing system analysis, flexible and cellular manufacturing systems, advanced planning and scheduling, quantitative techniques in inventory management, Vehicle routing and transportation network optimization, supply chain modeling and simulation, reverse logistics and remanufacturing systems analysis, artificial intelligence in computing, meta-heuristics and parallel computing
- ◇ A Registered Professional Engineer of Ontario (P.Eng);

EDUCATION

- Sep. 2002 – **Concordia University**, Montreal Quebec, CANADA
May 2006
PhD in Mechanical Engineering (Under the industrial engineering program). Thesis title: An Integrated Approach in the Design of Cellular Manufacturing Systems for Dynamic Production Requirements.
- Sep. 1998 – **Roorkee University (Indian Institute of Technology – IIT Roorkee)**, Uttar Pradesh, INDIA. Master of Engineering (**First Division with Honors**) in Mechanical Engineering with specialization in Production and Industrial Systems Engineering. Medium of instruction: English;
- Sep. 1990 – **Addis Ababa University**, Addis Ababa, ETHIOPIA
Jul. 1995
Bachelor of Science (**Distinction**) in Mechanical Engineering. Medium of instruction: English

HONORS WHILE I WAS A PHD STUDENT

- I. **Campaign for a New Millennium Graduate Scholarship (in Recognition of Superior Academic Achievement) - School of Graduate Studies, Concordia University**
For a period of tenure of 2 terms starting from September 1, 2004 and ending April 30, 2005; Tenable in Ph. D. Mechanical Engineering
- II. **Concordia University International Tuition Fees Remission Award**
For a period of tenure of 4 terms starting from May 1, 2004 and ending August 31, 2005; Tenable in Ph. D. Mechanical Engineering
- III. **Concordia University Graduate Fellowship**
For a period of tenure of 3 terms starting from September 1, 2004 and ending August 31, 2005; Tenable in Ph. D. Mechanical Engineering
- IV. **Concordia University Partial Tuition for International Students**
For a period of tenure of 1 term starting from September 1, 2005; Tenable in Ph. D. Mechanical Engineering

EMPLOYMENT

- Jul. 2015 – Associate Professor, University of Guelph, Guelph, Ontario, CANADA
to date
- Jan. 2010 – Assistant Professor, University of Guelph, Guelph, Ontario, CANADA
Jun. 2015
- May 2006 – Research Associate in Concordia University, Montreal, Quebec, CANADA
Dec. 2009
- Sep. 2002 – Research Assistant (while I was a PhD student) in Concordia University, Montreal, Quebec, CANADA
Apr. 2006
- Jan. 2000 – Lecturer, Addis Ababa University, ETHIOPIA
Aug. 2002
- Sep. 1996 – Assistant Lecturer, Addis Ababa University, ETHIOPIA
Aug. 1998
- Sep. 1995 – Graduate Assistant, Addis Ababa University, ETHIOPIA
Aug. 1996

INDUSTRIAL PROJECTS

- Sep. 2016 –
Nov. 2017 **Integrated Production and Manpower Scheduling:** The research problem identified in a local industry involves the scheduling of very large number of orders in one of their Toronto manufacturing facilities. The system consists of a large number of stations that process many batches of products. Some stations have identical parallel machines that share limited number of tools. There are also limited number of cross trained operators. In some processing stations, an operator can be assigned to tend more than one machine at a time. The products need assembly operations where the components and subassemblies including the final assemblies need to pass through sequences of processing stations. Some processing and assembly operations (semi-finished products) are also required to be sent to an outside manufacturer where the products are returned after a specified lead time for further in-house processing. The jobs have to be scheduled to meet due dates and at the same time the load across the parallel machines and among the operators need to be balanced. The work-in-process inventory has to be maintained at the lowest possible. This scheduling problem is different from standard problems that are well documented in literature. To solve this new scheduling problem, we applied the event-scheduling/time-advance algorithm from the theory of discrete event systems simulation.
- Nov. 2013 –
Apr. 2014 **Scheduling Mold Stations:** This research project is in collaboration with University of Guelph and a local industry specialized in Auto part manufacturing and painting. I was involved in a research project to develop an algorithm for scheduling many plastic injection mold stations that feed parts to automated paint lines. The scheduling problem encountered is extremely different from classical scheduling problems that are commonly addressed in literature.
- May 2011 –
Aug. 2011 **Scheduling in a local food Processing Industry:** The vast majority of algorithms appeared in literature are of limited use to companies with specific problems. Real-world scheduling problems are extremely different from research problems and quite often they are very complicated. A research project I encountered in a local industry is a typical example of these types of scheduling problem. A highly paced upstream continues process of a constant speed is feeding hundreds of intermittent downstream operations interconnected by network of conveyors. The scheduling of the downstream operations calls for a balance of material flow at all processing stations and a timely demand satisfaction of products.
- Jan. 2009 –
Dec. 2009 **Cost Estimation:** This project is in collaboration with Concordia University and Bombardier Aerospace, a global leader in the manufacturing and assembling of regional and business jets. I was developing cost estimation tools for major aircraft sub-assemblies and components. The tools are based on artificial intelligence techniques such as neural networks, fuzzy rule base systems and genetic algorithm. I was also developing new parametric cost estimation models which are different from the conventional linear or non-linear regression based approaches. The application of Data Envelopment Analysis has been investigated for cost estimation.
- Jun. 2008 –
Sep. 2008 **Supply Chain Planning:** During summer 2008, I worked on industrial project from Pratt & Whitney Canada (an aerospace company) in collaboration with Concordat University. I developed a decision support system that takes bottleneck data of producer/supplier lines versus engine families and highlights the opportunity of trade-offs among engine families with the objective to minimize the number of engines that would be overdue by the end of the planning period under consideration.
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RESEARCH GRANTS: (Total 682,695.00 CAD)

Jan. 2010	40,000.00 - University Startup Fund.
Sep. 2018 – July. 2019	30,000.00 - Data Driven Supplier Evaluation, Selection and Management System: Phase-1. A total of 30,000.00 cash contribution from TRIGO Global Quality Solution
Sep. 2017 – Mar. 2018	35,865.00 - Production and Manpower Scheduling, 23,865.00 cash contribution from NSERC-Engage and 12,000.00 in-kind contribution from ETBO Tools & Die Inc.
May 2017 – Aug. 2021	105,000.00 - A Comprehensive Framework and Solution Procedure for Dynamic Scheduling and Supervisory Control in Manufacturing Systems, NSERC Discovery.
May 2017 – Oct. 2017	42,058.00 - An Integrated Production and Manpower Scheduling - Second Phase. A sum of 12,498.00 cash contribution from NSERC-Engage-Plus, 12,500.00 cash contribution from MERSEN Canada Trononto Inc., and 17,060.00 in-kind contribution from the same industrial collaborator.
Sep. 2016 – Feb. 2017	39,612.00 - An Integrated Production and Manpower Scheduling, 24,612.00 cash contribution from NSERC-Engage and 15,200.00 in-kind contribution from MERSEN Canada Trononto Inc.
Nov. 2013 – Apr. 2014	31,890.00 - Solving non-conventional scheduling problem in a complex automated paint line, 21,000.00 cash contribution from NSERC-Engage and 10,890.00 in-kind contribution from Polycon Industries of Magna International.
May. 2011 – Aug. 2016	120,000.00 - An integrated approach in modeling, optimization, and simulation of non-conventional manufacturing systems, NSERC Discovery.
Sep. 2015 – Aug. 2019	110,000.00 - Life cycle analysis/costing of bio-materials, as a Co-PI in 3.2 million research project headed by Prof. Amar K. Mohanty and titled Innovation and Commercialization of Bio-Carbon from Advanced Biorefinery for Green Composites Applications, Ontario Research Fund ORF-RE Round 7.
Mar. 2012 – Mar. 2013	40,220.00 - Virtual Prototyping of Reconfigurable Manufacturing Systems, NSERC-Research Tool and Instruments.
May 2016 – Apr. 2019	28,500.00 - Growth Fund from the School of Engineering in the College of Physical and Engineering Sciences at the University of Guelph, Guelph
Sep. 2016 – Apr. 2018	9,200.00 - Growth Fund from the School of Engineering in the College of Physical and Engineering Sciences at the University of Guelph, Guelph.
Sep. 2011 – Aug. 2014	45,000.00 - Growth Fund from the School of Engineering in the College of Physical and Engineering Sciences at the University of Guelph, Guelph
May 2010 – Aug. 2010	6,000.00 - Simulation in Cellular Manufacturing Systems, Funding for Summer Undergraduate Research Assistantship (URA).
May 2016 – Aug. 2016	4,500.00 - Simulation modelling and Analysis of AGV Served Distributed Layout Manufacturing Systems, Funding from NSERC for Undergraduate Student Research Award (USRA)
May 2015 – Aug. 2015	4,500.00 - Simulation modelling and Analysis of Distributed Layout based Manufacturing Systems, Funding from NSERC for Undergraduate Student Research Award (USRA)
May 2014 – Aug. 2014	4,500.00 - Virtual Modelling and Simulation of Machine Tools using CAD System, Funding from NSERC for Undergraduate Student Research Award (USRA)

May 2012 – Aug. 2012	4,500.00 - Parametric and Intelligent Design of Metal Forming Dies, Funding from NSERC for Undergraduate Student Research Award (USRA)
Apr. 2011 – Mar. 2012	5,000.00 - NSERC Additional Funding for Early Career Researchers.
Jul. 2012 – Sep. 2012	2,050.00 - Development of Integrated Quality Management Systems, NSERC-Interaction

REFEREED JOURNAL PAPERS (Total of 35)

1. Paul, S., Dutta, A., Thimmanagarib, M., and Defersha, F.(2019). Techno-economic assessment of corn stover for hybrid bioenergy production: A sustainable approach. *Case Studies in Thermal Engineering*, **In press**
2. Al-Wajidi, W., Deiab, I., Defersha, F. and Elsayed, A. (2018). Effect of MQL on the microstructure and strength of friction stir welded 6061 Al alloy, *International Journal of Advanced Manufacturing Technology*, **In press**.
3. Paul, S., Dutta, A., and Defersha, F.(2018). Biocarbon, biomethane and biofertilizer from corn residue: A hybrid thermo-chemical and biochemical approach. *Energy*, Vol. **165**, 370-384
4. Defersha, F. M., and Mohebalizadehgashti, F. (2018). Simultaneous Balancing, Sequencing, and Workstation Planning for a Mixed Model Manual Assembly Line using Hybrid Genetic Algorithm, *Computers & Industrial Engineering*, Vol. **119**, 370-387.
5. Defersha, F. M., and Bayat Movahed, S. (2018). Linear programming assisted (not embedded) genetic algorithm for flexible jobshop scheduling with lot streaming, *Computers & Industrial Engineering*, Vol. **117**, 319-335.
6. Paul, S., Dutta, A., and Defersha, F.(2018). Mechanical and Alkaline Hydrothermal Treated Corn Residue Conversion in to Bioenergy and Biofertilizer: A Resource Recovery Concept. *Energies*, Vol. **11**, 516
7. Paul, S., Dutta, A., Defersha, F., and Dubey, B. (2018). Municipal Food Waste to Biomethane and Biofertilizer: A Circular Economy Concept. *Waste and Biomass Valorization*, Vol. **9**, 601-611
8. Defersha, F. M, and Hodiya, A. (2017). A Mathematical Model and a Parallel Multiple Search Path Simulated Annealing for an Integrated Distributed Layout Design and Machine Cell Formation, *Journal of Manufacturing Systems*, Vol. **43**, 195-212.
9. Shafiqh, F., Defersha, F. M., and Moussa, S.E., (2017). A Linear Programming Embedded Simulated Annealing in the Design of Distributed Layout with Production Planning and Systems Reconfiguration. *International Journal of Advanced Manufacturing Technology*, Vol. **88**, 1119-1140
10. Muthuraj, R., Misra, M., Defersha, F., and Mohanty, A. K., (2016). Influence of processing parameters on the impact strength of biocomposites: A statistical approach. *Composites: Part A: Applied Science and Manufacturing*, Vol. **83**, 120-129.
11. Defersha, F. M., (2015) A Simulated Annealing with Multiple Search Paths and Parallel Computation for a Comprehensive Flowshop Scheduling Problem. *International Transactions in Operational Research*, Vol. **22**, 669-691
12. Liu, Y., Chang, S., Defersha, F. M., Guo, Q., and Chen, R., (2015). Characterization of Proton Binding Properties of Extracellular Polymeric Substances in an Expanded Granular Sludge Bed Using Linear Programming Analysis. Accepted and published online in the *Journal of Advances in Biology & Biotechnology*, ISSN: 2394-1081.

13. Liu, Y., Chang, S., and Defersha, F. M., (2015). Characterization of the proton binding sites of extracellular polymeric substances in an anaerobic membrane bioreactor. *Water Research*, Vol. **78**, 133143.
14. Shafiqh, F., Defersha, F. M., and Moussa, S.E., (2015). A mathematical model for the design of distributed layout by considering production planning and system reconfiguration over multiple time periods. *Journal of Industrial Engineering International*, Vol. **11**. 283-295
15. Zarrinbakhsh, N., Defersha, F. M., Mohanty, A. K., and Misra, M. (2014) A Statistical Approach to Engineer a Biocomposite Formulation from Biofuel Coproduct with Balanced Properties. *Journal of Applied Polymer Science*, Vol. **131** (Issue 13).
16. Defersha, F. M., and Chen, M., (2012). Job shop lot streaming with routing flexibility, sequence-dependent setups, machine release dates and lag time. *International Journal of Production Research*, Vol. **50**, 2331-2352.
17. Defersha, F. M., and Chen, M., (2012) A Mathematical Model and Parallel Genetic Algorithm for Solving Hybrid Flexible Flowshop Lot Streaming Problem. *International Journal of Advanced Manufacturing Technology* Vol. **62**, 246 - 265
18. Salam, A., Defersha, F. M., and Bhuiyan, N., (2012) A case study to estimate costs using neural networks and regression based models. *Decision Science Letters*, Vol. 1, 1-10.
19. Defersha, F. M., Salam, A., and Bhuiyan, N., (2012) A new approach for cost estimation using data envelopment analysis. *International Journal of Industrial Engineering Computations*, Vol. 3, 817-828.
20. Salam, A., Defersha, F. M., Bhuiyan, N. F., and Chen, M., (2012) A Case Study on Target Cost Estimation using Genetic Algorithm Trained and Back-Propagation Trained Neural Networks. *Journal of Cost Analysis and Parametrics* , Vol. 5, 87-97.
21. Salam, A. M., Bandaly, D. and Defersha, F. M., (2011). Optimizing the Design of a Supply Chain Network with Economies of Scale using Mixed Integer Programming. *International Journal of Operations Research* Vol. 10, No. 4, 398 - 415.
22. Defersha, F.M., and Chen, M., (2011). A Genetic Algorithm for One-Job M-Machine Flowshop Lot Streaming with Variable Sublots. *International Journal of Operations Research* Vol. 10, No. 4, 458 - 468.
23. Herrn, A., Defersha, F. M., Chen, M., and Jess M.de la Cruz J. M., 2011. An integrated multi-period planning of the production and transportation of multiple petroleum products in a single pipeline system. *International Journal of Industrial Engineering Computations*, Vol. 2 No. 1, 19-44.
24. Defersha, F. M., (2011). A Comprehensive Mathematical Model for Hybrid Flexible Flowshop Lot Streaming Problem. *International Journal of Industrial Engineering Computations* Vol. 2 No. 2, 283-294.
25. Defersha, F. M., and Chen, M., (2010). A Parallel Genetic Algorithm for a Flexible Job Shop Scheduling with Sequence Dependent Setups. *International Journal of Advanced Manufacturing Technology*, Vol. **49**, 263-279.
26. Defersha, F. M., and Chen, M.Y., (2010). A Hybrid Genetic Algorithm for Flowshop Lot Streaming with Setups and Variable Sublots. *International Journal Production Research*, Vol. **48**, No. 6, 1705 - 1726.
27. Khataie, A., Defersha, F. M., and Bulgak, A. A.,(2010) A multi-objective optimization approach for order management: Incorporating Activity-Based Costing in supply chains. *International Journal of Production Research* Vol. **48**, 5007 - 5020.
28. Defersha, F. M., and Chen, M., (2009) A Simulated Annealing Algorithm for Dynamic System Reconfiguration and Production Planning in Cellular Manufacturing. *A special issue in Reconfigurable Manufacturing Systems: Concepts, Technologies and Applications in the International Journal of Manufacturing Technology and Management* Vol. **17**, 103-124

29. Cao, D., Defersha, F. M., and Chen M.,(2009) Grouping Operations in Cellular Manufacturing Considering Alternative Routings and the Impact of Run Length Product Quality. *International Journal of Production Research* on Vol. **47**, No. 4, 989-1013.
30. Defersha, F. M., and Chen, M., (2008) A Parallel Multiple Markov Chain Simulated Annealing for Multi-Period Manufacturing Cell Formation Problems. *International Journal of Advanced Manufacturing Technology* Vol. **37**, No. 1-2, 140-156
31. Defersha, F. M., and Chen, M., (2008) A Linear Programming Embedded Genetic Algorithm for an Integrated Dynamic Cell Formation and Lot Sizing Considering Product Quality. *European Journal of Operational Research* Vol. **187**, 46-69
32. Defersha, F. M., and Chen, M., (2008) A Parallel Genetic Algorithm for Dynamic Cell Formation in Cellular Manufacturing Systems. *International Journal of Production Research* Vol. **46**, 6389–6413
33. Hu, B., Chen, M., and Defersha, F. M., (2007). An Integrated Method for Multi-Objective Cell Formation in Cellular Manufacturing Systems. *International Journal of Manufacturing Technology Management*. Vol. **11**, No. 3/4, 355–372
34. Defersha, F. M., and Chen, M., (2006). Machine Cell Formation Using a Mathematical Model and a Genetic Algorithm Based Heuristic. *International Journal of Production Research*. Vol. **44**, No. 12, 2421–2444
35. Defersha, F. M., and Chen, M., (2006). A Comprehensive Mathematical Model for the Design of Cellular Manufacturing System. *International Journal of Production Economics*. Vol. **103**, No. 2, 767-783

BOOK (Total of 1)

36. Salam, A., and Bhuiyan, N., Defersha, F. M., (2014) Measuring Target Costs using Lean Accounting. Scholars' Press, Saarbrücken, Germany, ISBN 978-3-639-71681-8

Aerospace is very important to the Canadian economy, with over 80,000 employees; generating over \$20 billion dollars in revenue. However, with the economic downturn, sales have been decreasing. Competition is growing with emerging countries entering the market, companies are struggling to stay competitive, and they are adopting various practices to deliver value to their customers. The principles of lean manufacturing strive to do just that, and while enjoying much success in production environments, lean principles have been found to be applicable in other areas of the enterprise, including accounting. This study presents the notion of target costing for new products. In comparison to traditional costing of products, where the desired profit is added to the cost required to develop the product, target costing is lean in the sense that it puts the focus on creating value for the customer by setting the price of the product based on the cost. In this book, various types of target cost models are developed. The models are then applied to predict the cost of commodities at a major Canadian aerospace company.

BOOK CHAPTERS (Total of 1)

37. Defersha, F.M., and Chen, M., (2004), Designing Cellular Manufacturing Systems: A Genetic Algorithm Approach. In *Advances in Dynamics, Instrumentation and Control*, Editors: C-Y. Su, S. Rakheja, E. Wang and R. Bhat (**World Scientific Publishing Co.**), ISBN: 978-981-256-086-5, pp.387-396

INVITED TALKS (Total of 2)

38. Defersha, F. M. (2018) Research directions in manufacturing systems scheduling, an invited seminar talk at **Concordia University**, Department of Mechanical and Industrial Engineering, Oct 15, 2018, Montreal, ON, Canada.

Manufacturing systems scheduling is one of the very difficult optimization problems known to the research community and has been an active field of research for many decades. Countless number of articles are published in the area. However, very little has been written on how to bring theoretical research into practice. Perhaps the research community has over emphasized the mathematical rigor at the cost of under-emphasizing real implementations. Based on my research and industrial experience, I delivered an invited seminar talk to a group of faculties and students on how to make scheduling research relevant to real industrial applications.

39. Defersha, F. M. (2017) Research directions in manufacturing systems scheduling, an invited seminar talk at **Dalhousie University**, Department of Industrial Engineering, June 12, 2017, Halifax, NS, Canada.

REFEREED PROCEEDINGS (Total of 15)

40. Wisam Al-Wajidi, Deiab, I., and Defersha, F. M., (2018). The effect of Minimum Quantity Lubrication on the FSW Process, CSME International Congress 2018, May 27-30, 2018, Toronto, CANADA.
41. Wisam Al-Wajidi, Deiab, I., and Defersha, F. M., (2017). Modeling and Optimization of Submerged Friction Stir Welding of AA 2219-T6 Alloy, ICMAE, Sept 28, 2017, Toronto, CANADA.
42. Shafiq, F., Defersha, F. M., and Moussa, S.E., (2014). A Comprehensive model for the design of distributed layouts in manufacturing systems. IIE Conference and Expo 2014, Industrial and Systems Engineering Research Sessions, May 31 to June 03, Montreal, QC. CANADA.
43. Zarrinbakhsh, N., Defersha, F.M., Mohanty, A.K., and Misra. M., (2013). A Factorial Design of Distillers' Grains Based Biocomposites: A path to sustainability of corn ethanol. In the proceedings of the 19th International Conference on Composite Materials, July 28 - August 2, 2013, Montreal, QC. CANADA.
44. Defersha, F.M., Salam, A., and Bhuiyan, N., (2011). Product Cost Estimation Using Super Efficiency Data Envelopment Analysis. In the IEEE 2011 International Conference on Uncertainty Reasoning and Knowledge Engineering, Bali, 4-7 Aug. 2011. (DOI: 10.1109/URKE.2011.6007797)
45. Salam, A., Defersha, F.M., Bhuiyan, N., and Chen, M., 2010. A Case Study on Target Cost Estimation using a Genetic Algorithm and a Back-Propagation Based Neural Network in the proceeding of the International conference on engineering systems, March 30 - April 1, 2010, American University of Sharjah, United Arab Emirates.
46. Defersha, F.M., and Chen, M., (2009). A Coarse-Grain Parallel Genetic Algorithm for Flexible Job-Shop Scheduling with Lot Streaming. In the 12th IEEE International Conference on Computational Science and Engineering (CSE-09) August 29-31, Vancouver, Canada
47. Defersha F.M., Chen, M., and Bulgak, A.A., 2009, A Production Planning Model for a Hybrid Manufacturing-Remanufacturing System in Reverse Logistics, Proceedings of the International Conference on Management Technology and Applications (ICMTA 2009), Beijing, China.
48. Salam, A., Defersha, F. M., Muia, T. and Bhuiyan, N., (2009) Estimating Target Costs: A Case Study at Bombardier Aerospace. In the proceeding of the IIE Annual Conference and Expo 2009, May 30 - June 3, Miami, Florida, USA.
49. Defersha, F. M., Gonzalez, H.A., Chen, M.Y., and Garcia, J.M., (2008). A Mathematical Model for an Integrated Multi-period Planning of the Production and Transportation of Multiple Petroleum Products in a Pipeline System. In the proceeding of the sixth annual international symposium on Supply Chain Management, October 15-17, 2008, Alberta, Calgary, Canada
50. Khatie, A.H., Defersha, F.M., Bulgak, A.A., (2008), 2008, Maximizing Supply Chain Profits through Integration of the Residual Capacity, Proceedings of the Sixth Annual International Symposium on Supply Chain Management, Calgary, Alberta, Canada, October 15-17, 2008.

51. Khatie, A.H., Defersha, F.M., Bulgak, A.A., (2008), Maximizing Supply Chain Profits With Effective Order Management, In the proceeding of the 28th National Operations Research and Industrial Engineering Congress (YAEM 2008 Conference), Istanbul Turkey, June 30-July 2, 2008.
52. Koganti, R., Zaluzec, M. J., Chen, M., and Defersha, F.M., (2007), Design for Dis-Assembly: An AHP Approach for Automotive Front End Component Design and Evaluation. In the proceeding of SAE 2007 World Congress, Detroit, Michigan, USA, April 16-19, 2007
53. Koganti, R., Zaluzec, M. J., Chen, M., and Defersha, F.M., (2006), Design for Integrated Assembly and Disassembly of Automotive Products, In the proceedings of SAE 2006 World Congress, Detroit, Michigan, USA, April 3-6, 2006
54. Cao, D., Chen, M., and Defersha, F.M., (2005), Lot streaming and operation regrouping considering alternative process routes and production quality. In the proceeding of the International Conference on Production Research (ICPR) Salerno, Italy, July 31 - August 4, 2005

CONFERENCE PRESENTATIONS AND NON-REFEREED CONTRIBUTIONS (**Total of 14**)

55. Tadele, D., Roy, P., Defersha, F.M., Misra, M., and Mohanty, A. (2018). A comparative life cycle assessment between talc and biochar filled reinforced polymer composite for lightweight automotive parts. International Symposium on Bioplastics, Biocomposites and Biorefining, Guelph, Canada, July 24-27, 2018.
56. Defersha, F.M., and Majed Alzahrani, (2011). Pure flowshop vs hybrid flowshop scheduling with lot streaming. Abstract and presentation in the Annual Conference of the Canadian Operations Research Society. St. John's, NL, Canada.
57. Defersha, F.M., and Chen, M., (2008), Hybrid Flexible Flowshop Lot Streaming: A Mathematical Model and a Genetic Algorithm. CORS/Optimization Days Joint Conference, Quebec City, QC, CANADA, May 12 - 14, 2008
58. Defersha, F.M., and Chen, M., (2008), A Parallel Genetic Algorithm: A Computational Experience in Solving Manufacturing Cell Formation Problem. CORS/Optimization Days Joint Conference, Quebec City, QC, CANADA, May 12 - 14, 2008
59. Defersha, F.M., Ghasemi, M., and Chen, M., (2007), Multi-product lot streaming in a flow shop by considering buffered size and material handling equipment capacity constraints. Optimization Days 2007, Montreal, CANADA, May 7 - 9, 2007
60. Chen, M., and Defersha, F.M., (2006), A Multi-level Multi-item Capacitated Lot Sizing by considering the Impact of Run Length on Product Quality. CORS/Optimization Days Joint Conference, Montreal, CANADA, May 8 - 10, 2006
61. Chen, M., and Defersha, F.M., (2006), An Integrated Approach in the Design of Cellular Manufacturing and Production Planning for Dynamic Production Requirements. CORS/Optimization Days Joint Conference, Montreal, CANADA, May 8 - 10, 2006
62. Gonzalez, A. H., Garca, J. M., Defersha, F.M., and Chen, M., (2006), Planning of Petroleum Derivatives in Pipeline Transportation Systems using Genetic Algorithm. CORS/Optimization Days Joint Conference, Montreal, CANADA, May 8 - 10, 2006
63. Defersha, F.M., and Chen, M., (2005), A Coarse-Grained Parallel Genetic Algorithm for Cellular Manufacturing System Design. Optimization Days 2005, Montreal, CANADA, May 9 - 11, 2005
64. Defersha, F.M., and Chen, M., (2005), A Parallel Simulated Annealing Algorithm for Cellular Manufacturing System Design. 47th Annual Conference of the Canadian Operational Research Society, Halifax, CANADA, May 16 - 18, 2005
65. Hu, B., Chen, M., and Defersha, F.M., (2005), An Integrated Method for Cellular Manufacturing Systems Design and Operation. 17th Triennial Conference of the International Federation of Operational Research Societies, Honolulu, Hawaii, United States, July 11 - 15, 2005

66. Defersha, F.M., (2001), STATISTICAL QUALITY CONTROL: Usefulness and Implementation Strategies . (Presented in the Quality and Productivity Workshop organized by the Ethiopian Society of Mechanical Engineers)
67. Defersha, F.M., (2001), Machine Cell Formation in the Design of Cellular Manufacturing Systems. (Published in the Journal of Ethiopian Society of Mechanical Engineers, Vol. III, No. 2, September 2001)
68. Defersha, F.M., (2000), GROUP TECHNOLOGY: An Introduction and Applicability to Developing Nations. (Published in the Journal of Ethiopian Society of Mechanical Engineers, Vol. III, No. 1, September, 2000)

THESIS WRITTEN

69. Defersha, F.M., (2006) An Integrated Approach to the Design of Cellular Manufacturing for Dynamic Production Requirements (PhD Thesis, Concordia University, Montreal, CANADA, Library Call No. LE 3 C66M43P 2006 D44)
70. Defersha, F.M., (1999) Machine Cell Formation through Neural Network Models (Master Thesis, Roorkee University (IIT-Roorkee), Utar Prudish, INDIA)

STUDENTS SUPERVISION

PhD Thesis Supervision

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|--------------------------|---|
| Jan. 2017 –
to date | Danial Rooyani (In Progress); Thesis Title: <i>A unified multi objective meta-scheduling algorithm for various discrete manufacturing systems</i> |
| Sep. 2011 –
Apr. 2015 | Seyedfarhad Shafigh (Completed); Thesis Title: <i>Comprehensive Models and Solution Procedures in the Design and Scheduling of Manufacturing Systems with Distributed Layouts</i> |
| Sep. 2010 –
Apr. 2012 | Majed Alzahrani (Withdrawn); Thesis Title: <i>Multi-objective meta-scheduling model and algorithm for discrete manufacturing systems</i> |

PhD Thesis Co-Supervision

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| May 2014 –
to date | Wisam Al-Wajidi (In Progress); Thesis Title: <i>Optimizing Friction Welding between dissimilar materials.</i> (My role is to guide the student in the areas of statistical analysis and design of experiments) |
| Sep. 2013 –
Aug. 2017 | Subhash Paul (Completed); Thesis Title: <i>Anaerobic Co-digestion of Food Waste with Lignocellulosic Biomass</i> (My role is to guide the student in the areas of statistical analysis and design of experiments) |

MSc Thesis Supervision

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|------------------------|---|
| Jan. 2019 –
to date | Dolapo Obimuyiwa (In Progress); Thesis Title: <i>Algorithm for Flexible Job Shop Scheduling with Limited Setup Operators</i> |
| Sep. 2018 –
to date | Dhruv Pater (In Progress); Thesis Title: <i>A Genetic Algorithm with Monte-Carlo Simulation for an Optimal Inspection Allocation in a Multistage Batch Assembly Operation with Dimensional Tolerance Stack-up</i> |
| Sep. 2017 –
to date | Debela Tadele (In Progress); Thesis Title: <i>Environmental life cycle assessment of lightweight solution for automotive components: A comparison between talc-filled and biocarbon reinforced composite</i> |

- Jan. 2017 – Mohammad Jalalian (Completed); Thesis Title: *Application of metaheuristics in scheduling continuous/semi-continuous process industries and a case study*
 Aug. 2018
- Sep. 2016 – Hayson Ko (Completed); Thesis Title: *Permutation based Genetic Algorithm for a Flexible Job-shop Scheduling Problem*
 Dec. 2017
- Sep. 2014 – Fatemeh Mohebalizadehgashti (Completed); Thesis Title: *Balancing, Sequencing and Determining the Number and Length of Workstations in a Mixed Model Assembly Line*
 Apr. 2016
- Sep. 2013 – Abenet Hodiya (Completed); Thesis Title: *A Mathematical Model and a Simulated Annealing Algorithm for an Integrated Facility Layout and Cell Formation*
 Apr. 2015
- Sep. 2012 – Saber Bayat-Movahed (Completed); Thesis Title: *Linear Programming Assisted Genetic Algorithm for Solving a Comprehensive Job shop Lot Streaming Problem*
 Apr. 2014

MEng Non-Thesis Supervision

- Jan. 2018 Krunal Prajapati (In Progress); Project Title: *A simulation study of components inventory re-order policy in assembly environment*
- Mar. 2017 – Narinderpal Singh (Completed); Project Title: *Study of genetic algorithm and simulation for optimal quality inspection allocation in multi-stage manufacturing systems*
 Aug. 2018
- Mar. 2017 – Aakash Miya (Completed); Project Title: *Study of genetic algorithm and simulated annealing in facility layout with irregularly shaped departments*
 Aug. 2018
- Jan. 2013 – Nishima Mehindru (Completed); Project Title: *Part-Machine Incidence Matrix Clustering using Artificial Intelligence and Heuristic Methods in Group Technology*
 Apr. 2014

Research Associate Supervision

- Dec. 2018 – Mohammad Jalalian (part-time), Project Title: *Data Driven Supplier Evaluation, Selection and Management System*
 To date
- Feb. 2018 – Poritosh Roy (part-time), Project Title: *Life cycle analysis and life cycle costing of biomaterials in engineering applications*
 to date
- May. 2015 – Abenet Hodiya (part-time), Project Title: *Model and algorithm for an integrated distributed layout and cellular manufacturing system design*
 Aug. 2015

Summer Undergraduate Research Supervision

- May 2016 – Hayson Ko; Project Title: *Simulation Modelling and Analysis of AGV served Distributed Layout Manufacturing Systems*
 Aug. 2016
- May 2015 – Storm Thiesin; Project Title: *Simulation Modelling and Analysis of Distributed Layout Manufacturing Systems*
 Aug. 2015
- May 2014 – Nicholas Machenzie; Project Title: *Virtual Modelling and Simulation of Machine Tools Using CAD System*
 Aug. 2014
- May 2013 – Sutikshan Vasishth; Project Title: *Die Design*
 Aug. 2013
- May 2012 – Jonathan Walsh; Project Title: *Parametric and Intelligent Design of Metal Forming Dies*
 Aug. 2012
- May 2010 – Julia Veerman; Project Title: *Simulation Modelling and Analysis of Cellular Manufacturing System*
 Aug. 2010

4th Year Capstone Project Supervision (30 students in 8 projects)

Jan. 2016 – Apr. 2016	Brad Holder, Fancisco Espino Valenzuela, Linden Noble and Mohammed Ibrahim; Project Title: <i>Automated Packaging Machine - A Prototype</i>
Jan. 2016 – Apr. 2016	Nic Flanagan, Riley Knox, Jonny Anstett and Michael Dobranowski; Project Title: <i>Optimizing Automotive Tire Mounting System</i>
Jan. 2016 – Apr. 2016	Srivikram Ashokkumar, Scott Clumpus, Evan Milliken and Hayson Ko; Project Title: <i>Facility Layout of Engine Assembly Line</i>
Jan. 2016 – Apr. 2016	Bhavin Mistry, James Parr, Max Sarnacki and Storm Thiessen; Project Title: <i>De- sign of a Simulation Model for an Automated Manufacturing Facility</i>
Jan. 2015 – Apr. 2015	Jonathan Zagazeta, Carlos Farias and Kellan King; Project Title: <i>Posture Moni- toring and Lumbar Support System</i>
Jan. 2015 – Apr. 2015	Sunil Kunwar, Dave Whitfield and Homayon Yousufi; Project Title: <i>Automated and Integrated Gantry System for Moving a Robot Arm that Tends a Manufacturing Cell</i>
Sep. 2014 – Dec. 2014	Eli Stewart, Tyler Bowman, Matthew Armster and Nicholas Mackenzie; Project Title: <i>Educational Small-Scale Automated Assembly Cell</i>
Sep. 2014 – Dec. 2014	Marie Beltrao, Tushar Obhrai, Jasdeep Tiwana and Desmond Sanfilippo; Project Title: <i>Design and Simulation of an Automated Manufacturing Process</i>

TEACHING EXPERIENCE AND INTEREST

1. I had served as Graduate Assistant (Sep. 1995 - Aug. 1996), as Assistant Lecturer (Sep. 1996 - Aug. 1998) and as Lecturer (Jan. 2000 - Aug. 2002) in the Department of Mechanical Engineering, Addis Ababa University (Ethiopia). In those years I had been also serving other two universities in Ethiopia on part-time bases.

Courses lectured include:

- (a) Industrial Management and Engineering Economy
- (b) Production Engineering
- (c) Statistical Quality Control
- (d) Tool and Die Design
- (e) Introduction to Probability and Statistics
- (f) Descriptive Geometry and Technical Drawing
- (g) Machine Drawing
- (h) Strength of Material
- (i) Engineering Mechanics (Dynamics)
- (j) Engineering Mechanics (Vibration)
- (k) List of project works for which I advised final year undergraduate students include:
 - Plant Layout Design: A heuristic approach
 - Software Development for Statistical Quality Control
 - Computer Support in Maintenance Planning
 - Machine Cell Formation in Cellular Manufacturing Systems
 - Piercing and Blanking Die Design

2. I taught several industrial engineering courses at Concordia University, Montreal CANADA on part-time bases (while I was research associate). These course are

- (a) Production System and Inventory Control (Graduate level, Winter 2006/7 and Winter 2007/8)
 - (b) Industrial Operations Research (Undergraduate, Winter 2007/8 and Winter 2008/9)
 - (c) Industrial Systems Simulation (Undergraduate, Fall 2009/10)
 - (d) Advanced Operations Research (Grad and Undergrad, Fall 2009/10)
3. Since my appointment at University of Guelph, School of Engineering, I have been teaching the following seven different courses.
- (a) Engineering Mechanics (Statics & Dynamics)
 - (b) Kinematics and Dynamics (Theory of machines)
 - (c) Computer Aided Design and Manufacturing (CAD/CAM)
 - (d) Integrated Manufacturing Systems (Computer Integrated Manufacturing Systems)
 - (e) Optimization Techniques (Graduate)
 - (f) Simulation Analysis of Discrete Even Systems (Graduate)
 - (g) Design of Experiments (Graduate)
4. List of additional courses that I can teach as a result of my MEng and PhD degrees in Industrial Engineering, research experience as post doctoral fellow, part-time teaching experience at Concordia University, and teaching and research experience as a professor at University of Guelph includes:
- (a) Manufacturing Systems Analysis
 - (b) Applied Probabilistic Modeling
 - (c) Decision Support Systems
 - (d) Logistics and Distribution
 - (e) Facility Planning
 - (f) Graph Theory with System Applications
 - (g) Scheduling Theory
 - (h) Human Factors Engineering (Ergonomics)

AFFILIATIONS AND OTHER PROFESSIONAL ACTIVITY

- Fully licensed member of Professional Engineers of Ontario (PEO)
- Professional Member of the Institute of Industrial and Systems Engineering (IISE) - <http://www.iise.org>
- Member of the Canadian Operations Research Society (CORS) - <http://www.cors.ca>
- Reviewer for the Journal of Manufacturing Systems (JMSY). This journal publishes state-of-the-art fundamental and applied research in manufacturing at the systems level.
- Reviewer for the European Journal of Operational Research (EJOR). This journal is among the top journals in operations management.
- Reviewer for the Applied Mathematical Modelling (APM). This journal is among the top journals in applied mathematical modelling in operations management and engineering.
- Reviewer for the International Journal of Production Research (IJPR). This journal is among the top journals in productions and industrial systems research.