

3.4.6: Number of books and chapters/ units in books/ SLMs published of the institution during the last five years (15)

Number of Books 3
 Number of Book Chapters 25

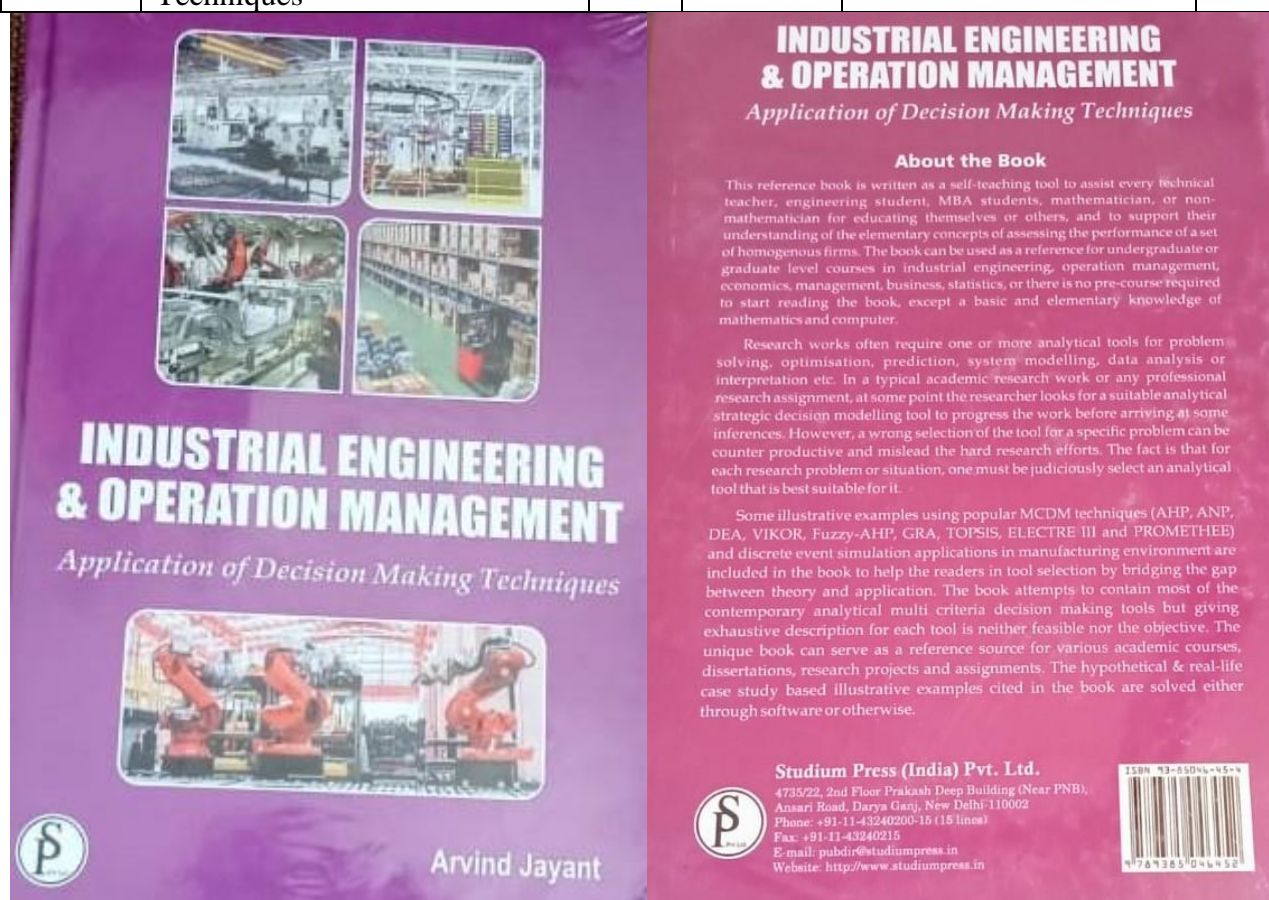
3.4.6.1: Total number of books and chapters in edited volumes / books published, and papers in national/international conference-proceedings year wise during the last five year

Sl. No.	Name of the teacher	Title of the book	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
1	Arvind Jayant	Industrial Engineering & Operation Management: Application of Decision-Making Techniques					2019	13-978-93-85046-45	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
2	Arvind Jayant	Sustainable Supply Chain Management: Models and Cases					2020		Sant Longowal Institute of Engineering and Technology, Longowal	IK International Publication Pvt. Limited, New Delhi
3	Anand Parey, Rajesh Kumar, Manpreet Singh	Recent Trends in Engineering Design Select Proceedings of ICASST 2020: Select Proceedings of ICASST 2020					2021	978-981-16-1078-3	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
Sl. No.	Name of the teacher	Title of the book chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
1	Sandeep S Sandhu and A. S. Shahi		Fracture Toughness and Fatigue Behaviour of Variably Precipitated Inconel 625/AISI 304L Welds			International	2018	978-3-319-89480-5	Sant Longowal Institute of Engineering and Technology, Longowal	The Minerals, Metals & Materials Series book series
2	A. S. Shahi and Sandeep S Sandhu		Pitting Behavior of Thermally Aged Inconel 625 Weld Claddings Made Using SMAW and GMAW Process			International	2018	978-3-319-89480-5	Sant Longowal Institute of Engineering and Technology, Longowal	The Minerals, Metals & Materials Series book series
3	Sunil Kumar, Rastogi Vikas and Pardeep Gupta	A hybrid control scheme for modeling and control of 1-DOF flexible arm URM for welding applications	A hybrid control scheme for modeling and control of 1-DOF flexible arm URM for welding applications	13th International Conference on Bond Graph Modeling (ICBGM 2018) Bordeaux, France 2018 Summer Simulation Multi-Conference (SummerSim'18) Simulation Series Volume 50 Number 12 Bond Graph Modeling (ICBGM 2018) Bordeaux, France 2018 Summer Simulation Multi-Conference (SummerSim'18) Simulation Series Volume 50 Number 12	13th International Conference on Bond Graph Modeling (ICBGM 2018)	International	2018	978-1-5108-6025-4	Sant Longowal Institute of Engineering and Technology, Longowal	The society for modeling and simulation international
4	Arvind Jayant, Neeru	Patnaik S. (eds) New Paradigm of Industry 4.0. Studies in Big Data, vol 64. Springer, Cham	Decision Support framework for smart implementation of green supply chain practices in the book titled "Studies in Big data			International	2019	978-3-030-25777-4	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
5	Arvind Jayant, Janpriy Sharma	Operations Management and Systems Engineering	Modelling, Simulation and Optimization of Product Flow in a Multi-products Manufacturing Unit: A Case Study			International	2019	ISBN978-981-13-6476-1.	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
6	Jitendra Upadhyay, Anuj Bansal, Jagtar Singh	Effect on Mechanical and Metallurgical Properties of Cryogenically Treated Material SS316	Effect on Mechanical and Metallurgical Properties of Cryogenically Treated Material SS316	Manufacturing Engineering, Lecture Notes on Multidisciplinary Industrial Engineering, Springer, Singapore	Vth International Conference on Production & Industrial Engineering (CPIE 2018)	International	2019	978-981-13-6287-3	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
7	Shweta Singh, Arvind Jayant, Tanmay Walke	Advances in Production and Industrial Engineering, Lecture Notes in Mechanical Engineering	A robust hybrid multi-criteria decision-making approach for selection of third-party reverse logistics service provider			International	2019	2195-4356	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
8	Anshul Agarwal, Arvind Jayant, Vaibhav Gupta	Advances in Production and Industrial Engineering	Application of Machine Learning Technique for demand forecasting: A Case Study of manufacturing industry			International	2019	2195-4356	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
9	Vivek Gupta, Arvind Jayant	Lecture Notes in Mechanical Engineering (Springer Publication)	Low Carbon Supply Chain Management: A Fuzzy-DEMATEL Analysis of Some Practical Issues of Indian Manufacturing Industries			International	2019	2195-4356.	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
10	Upender Dhull & Pardeep Gupta	Performance and Emission testing of Diesel Engine using blends of Biodiesel from Castor Oil and Neem Oil prepared using Lithium Doped CaO Nano-Catalyst	Performance and Emission testing of Diesel Engine using blends of Biodiesel from Castor Oil and Neem Oil prepared using Lithium Doped CaO Nano-Catalyst	Springer Proceeding Lecture Notes in Mechanical Engineering	4th International conference on "Emerging Trends in Mechanical and Industrial Engineering"	International	2019	2195-4364	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
11	Singh A., Bansal A., Singh J., and Singla A.K.	Manufacturing Engineering, Lecture Notes on Multidisciplinary Industrial Engineering, Springer, Singapore	EFFECT OF CRYOGENIC TREATMENT ON MECHANICAL AND METALLURGICAL PROPERTIES OF SS410			International	2020	2522-5030	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
12	A. Bansal, J. Singla, S. Pandey, P. Raj.	Design and Development of High-Velocity Submerged Water Jet Cavitation Erosion Test Rig	Design and Development of High-Velocity Submerged Water Jet Cavitation Erosion Test Rig	Manufacturing Engineering, Lecture Notes on Multidisciplinary Industrial Engineering, Springer, Singapore	Vth International Conference on Production & Industrial Engineering (CPIE 2019)	International	2020	978-981-15-4619-8	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
13	A. Singh, A. Bansal, J. Singh, A. K. Singla	Effect of Cryogenic Treatment on Mechanical and Metallurgical Properties of SS410	Effect of Cryogenic Treatment on Mechanical and Metallurgical Properties of SS410	Manufacturing Engineering, Lecture Notes on Multidisciplinary Industrial Engineering, Springer, Singapore	Vth International Conference on Production & Industrial Engineering (CPIE 2019)	International	2020	978-981-15-4619-8	Sant Longowal Institute of Engineering and Technology, Longowal	Springer

14	A. Saxena, R. K. Saxena	Thermomechanical Analysis of Al-7075 to Predict Residual Stresses by Using 3D Finite Element Simulation	Thermo-mechanical analysis of Al-7075 to predict residual stresses by using 3-D FEM simulation	Advances in Mechanical Engineering	International Conference on Recent Innovations and Developments in Mechanical Engineering (IC-RIDME 2018)	International	2020	978-981-15-0123-4	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
15	G. Singh, R. K. Saxena, S. Pandey	Finite Element Based Prediction of Transient Temperature Distribution, Heat Affected Zone and Residual Stresses in AISI 304 Stainless Steel Weldment	Finite Element Based Prediction of Transient Temperature Distribution, Heat Affected Zone and Residual Stresses in AISI 304 Stainless Steel Weldment	Advances in Mechanical Engineering	International Conference on Recent Innovations and Developments in Mechanical Engineering (IC-RIDME 2018)	International	2020	978-981-15-0123-4	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
16	Jastej Singh & A. S. Shahi	Weldability aspects of electron beam welded duplex stainless steel ¹ Nova Science	Weldability aspects of electron beam welded duplex stainless steel ¹ Nova Science			International	2020	978-1-53618-342-9	Sant Longowal Institute of Engineering and Technology, Longowal	Nova Science Publishers, New York, USA
17	Shahi, A.S., Malhotra, D.	Effect of Dual Phase Stabilization via Varying Ti/Nb Ratios on the Pitting Behavior of AISI 347 Welds	Effect of Dual Phase Stabilization via Varying Ti/Nb Ratios on the Pitting Behavior of AISI 347 Welds			International	2020	978-3-030-36627-8 978-3-030-36628-5	Sant Longowal Institute of Engineering and Technology, Longowal	In, et al. Characterization of Minerals, Metals, and Materials 2020. The Minerals, Metals & Materials Series. Springer, Cham.
18	Kumar S., Kaur P., Singh A.	Advances in Engineering Design	An Effect of Current on Mechanical Properties and SEM Characterization of Butt Joint of Aluminium AA6082 Using GTAW, pp 225-237	Part of the Lecture Notes in Mechanical Engineering book series (LNME), Advances in Engineering Design	International Conference on Innovative Engineering Design, 2020	International	2021	Print ISBN978-981-33-4017-6 Online ISBN978-981-33-4018-3	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
19	Nitin Yadav & Rajesh Kumar	Harvesting Electric Energy from Waste Vibrations of an Electric Motor Using the Piezoelectric Principle	Harvesting Electric Energy from Waste Vibrations of an Electric Motor Using the Piezoelectric Principle	Recent Advances in Manufacturing, Automation, Design and Energy Technologies	International Conference on future technologies in Manufacturing, Automation, Design, and Energy Technologies	International	2021	ISSN 2195-4364	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
20	Sunil Kumar, Vikas Rastogi, Prabhkiran Kaur	Active vibration control of two flexible links underwater manipulator	Active vibration control of two flexible links underwater manipulator	2021 INTERNATIONAL CONFERENCE ON BOND GRAPH MODELING AND SIMULATION, (ICBGM'2021) SIMULATION SERIES, VOLUME 53, NUMBER 3	2021 INTERNATIONAL CONFERENCE ON BOND GRAPH MODELING AND SIMULATION, (ICBGM'2021)	International	2021	978-1-7138-3946-0	Sant Longowal Institute of Engineering and Technology, Longowal	The society for modeling and simulation international
21	Pardeep Gupta and Sumit Kumar	Productivity Improvements in an Indian Automotive OEM Using Heijunka, A Lean Manufacturing Approach: A Case Study	Productivity Improvements in an Indian Automotive OEM Using Heijunka, A Lean Manufacturing Approach: A Case Study	Lecture Notes on Multidisciplinary Industrial Engineering	6 th International conference on Production & Industrial Engineering	International	2021	ISBN 978-981-15-6016-3 ISBN 978-981-15-6017-0 (eBook)	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
22	Kumar, S. and Kumar, R.	Classification of worm gearbox fault using Dendrogram Support Vector Machine	Classification of worm gearbox fault using Dendrogram Support Vector Machine	Recent Advances in Machines and Mechanisms	International Conference on Machines and Mechanisms	International	2022	978-981-19-3715-6	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
23	Vashishtha, G. and Kumar, R.	Feature Selection Based on Gaussian Ant Lion Optimizer for Fault Identification in Centrifugal Pump	Feature Selection Based on Gaussian Ant Lion Optimizer for Fault Identification in Centrifugal Pump	Recent Advances in Machines and Mechanisms	International Conference on Machines and Mechanisms	International	2022	978-981-19-3715-6	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
24	Singla, J., Bansal, A., Singla, A. K., & Goyal, D. K.	Nanomaterials in Manufacturing Processes	Investigating the Effect of Magnetic Nanoparticles in Magneto-Rheological (MR) Fluid for Monotube Damper Testing			International	2022	9781003154884 pp. 125-140	Sant Longowal Institute of Engineering and Technology, Longowal	In Nanomaterials in Manufacturing Processes, CRC Press.
25	Giri, N., Brar, G.S., Shahi, A. S.	Correction to: Investigation of Mechanical Properties in Friction Stir Welded Mg AZ 31 Alloy Workpieces	Correction to: Investigation of Mechanical Properties in Friction Stir Welded Mg AZ 31 Alloy Workpieces			International	2022	978-3-030-99569-0 978-3-030-99568-3	Sant Longowal Institute of Engineering and Technology, Longowal	In Additive, Subtractive, and Hybrid Technologies, Springer

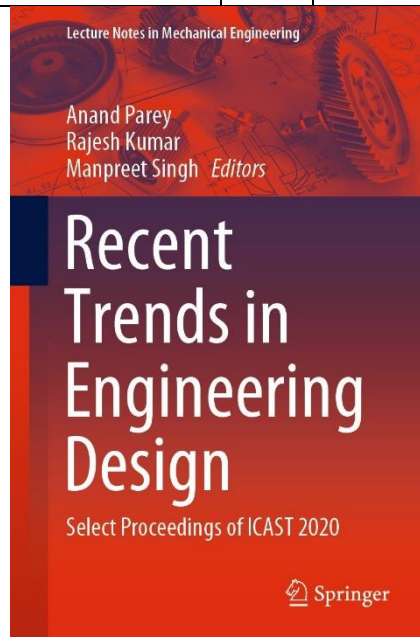
3.4.6 Proof of Books (Cover page, ISBN No, Yr of Pub)

1	Arvind Jayant	Industrial Engineering & Operation Management: Application of Decision-Making Techniques	2019	13-978-93-85046-45	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
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2	Arvind Jayant	Sustainable Supply Chain Management: Models and Cases	2020		Sant Longowal Institute of Engineering and Technology, Longowal	IK International Publication Pvt. Limited, New Delhi (under press)
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3	Anand Parey, Rajesh Kumar, Manpreet Singh	Recent Trends in Engineering Design Select Proceedings of ICAST 2020: Select Proceedings of ICAST 2020	2021	978-981-16-1078-3	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
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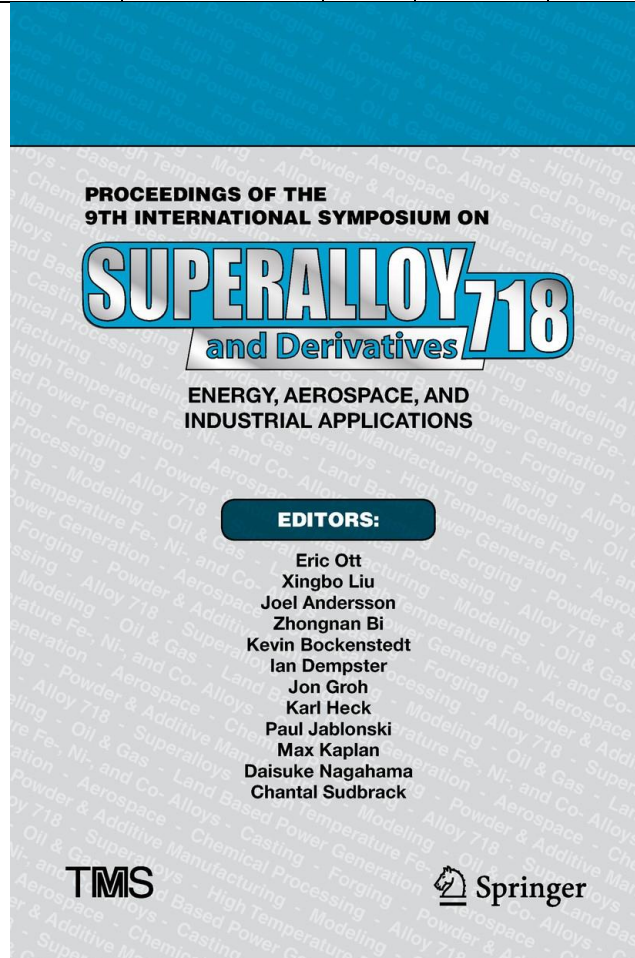
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3.4.6 Proof of Book Chapters (Cover page, ISBN No, Yr of Pub)

1	Sandeep S Sandhu and A. S. Shahi	Fracture Toughness and Fatigue Behaviour of Variably Precipitated Inconel 625/AISI 304L Welds	International	2018	978-3-319-89480-5	Sant Longowal Institute of Engineering and Technology, Longowal	The Minerals, Metals & Materials Series book series
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Fracture Toughness and Fatigue Behaviour of Variably Precipitated Inconel 625/AISI 304L Welds

Sandeep Singh Sandhu & A. S. Shahi

Conference paper | First Online: 13 May 2018

4578 Accesses | 1 Citations

Part of the [The Minerals, Metals & Materials Series](#) book series (MMMS)

Abstract

Nickel based superalloy Inconel 625 welds were fabricated by depositing its filler in AISI 304L substrate using a single-V groove configuration and employing SMAW (Shielded metal arc welding) as well as GMAW (gas metal arc welding) process. Fatigue crack growth and fracture toughness characteristics of SMA weld Inconel 625 compact tension specimens of thickness 25 mm in as welded and after post weld thermal aging treatments (temperatures ranging from 650 to 850 °C and duration of 10 and 100 h) were investigated on the basis of curves plotted between crack length and number of cycles. Fatigue crack growth rate was examined in delta k range of 21–39 MPa \sqrt{m} . Varying degree of precipitation in these welds was observed due to thermal aging which influenced their fracture toughness significantly. The fracture toughness values for SMA weld Inconel 625 specimens in as welded condition was found to be J_{max} (213.183 kJ/m²) and J_Q (5.618 kJ/m²) Whereas, the treatment (650 °C/100 h) specimen exhibited stable crack growth during the J-integral test and J_{max} increased to (221.58 kJ/m²) and J_Q (12.56 kJ/m²).

Keywords

Inconel 625 AISI 304L Fracture toughness and fatigue crack growth SMAW

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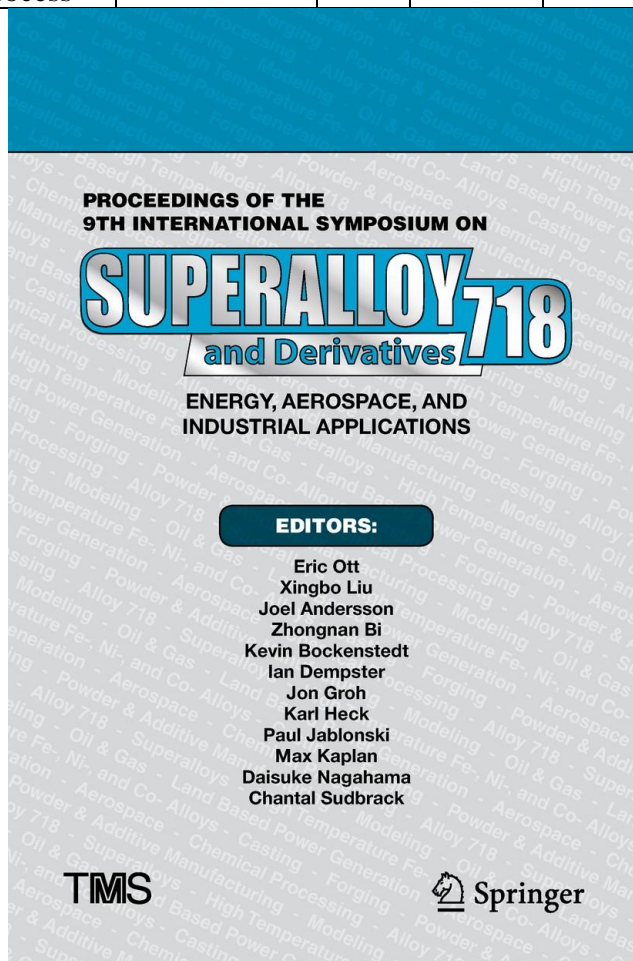
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2	A. S. Shahi and Sandeep S Sandhu	Pitting Behavior of Thermally Aged Inconel 625 Weld Claddings Made Using SMAW and GMAW Process	International	2018	978-3-319-89480-5	Sant Longowal Institute of Engineering and Technology, Longowal	The Minerals, Metals & Materials Series book series
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Proceedings of the 9th International Symposium on Superalloy 718 & Derivatives: Energy, Aerospace, and Industrial Applications pp 881–898 | [Cite](#)

Pitting Behavior of Thermally Aged Inconel 625 Weld Claddings Made Using SMAW and GMAW Process

A. S. Shahi & Sandeep Singh Sandhu

Conference paper | [First Online: 13 May 2018](#)

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Abstract

Comparative investigations were carried out where multipass multi-layers of Inconel 625 (UNS N06625) weld claddings were overlaid on 12 mm thick austenitic stainless steel plates (AISI 304L) using SMAW (shielded metal arc welding process) and GMAW (gas metal arc welding) process. The specimens extracted from the clad plates were subjected to four different post weld thermal aging treatments (650 °C/10 h, 650 °C/100 h, 850 °C/10 h and 850 °C/100 h). The pitting corrosion of Inconel 625 clads was evaluated using PAP (Potentiodynamic anodic polarization) technique and the results were generated as pitting curves which depicted their behavior. Pitting potential (E_{pit}) for these welds varied from 31.77 to 922.7 mV. Under all conditions, the GMA welds showed better pitting performance than the SMA welds. Aging treatment of 650 °C/10 h improved the pitting resistance of both the welds, as pitting potential of 922.7 mV (which was recorded as the highest value of E_{pit} among all the welds) was observed in case of GMA weld and 384 mV for the SMA weld. Precipitation strengthening occurred under this aging condition which was attributable to the presence of Laves phase, γ' and γ'' -phase, besides carbides in Inconel 625 weld/clad metal. However, a loss of pitting resistance was observed under aging conditions 850 °C/10 h and 100 h, which

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[Acknowledgements](#)

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3	Sunil Kumar, Rastogi Vikas and Pardeep Gupta	A hybrid control scheme for modeling and control of 1-DOF flexible arm URM for welding applications	A hybrid control scheme for modeling and control of 1-DOF flexible arm URM for welding applications	Summer Simulation Multi-Conference (SummerSim'18) Simulation Series Volume 50 Number 12 Bond Graph Modeling (ICBGM 2018) Series Volume 50 Number 12	13th International Conference on Bond Graph Modeling (ICBGM 2018)	International	2018	978-1-5108-6025-4	Santal Longowal Institute of Engineering and Technology, Longowal	The society for modeling and simulation international
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13th International Conference on Bond Graph Modeling (ICBGM 2018)

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Simulation Series Volume 50 Number 12
Bordeaux, France
9 – 12 July 2018

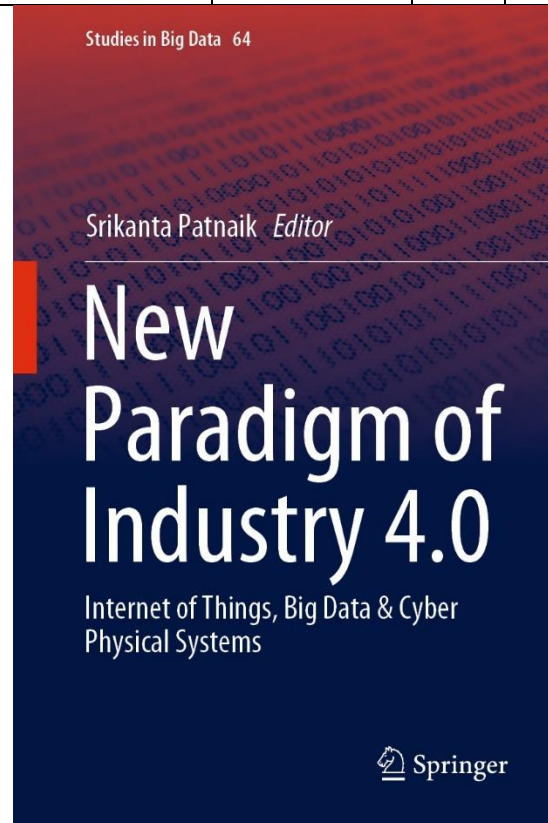
Editors:

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ISBN: 978-1-5108-6025-4

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4	Arvind Jayant, Neeru	Patnaik S. (eds) New Paradigm of Industry 4.0. Studies in Big Data, vol 64. Springer, Cham	Decision Support framework for smart implementation of green supply chain practices in the book titled "Studies in Big data	International	2019	978-3-030-25777-4	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
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New Paradigm of Industry 4.0 pp 49–98 | [Cite as](#)

Decision Support Framework for Smart Implementation of Green Supply Chain Management Practices

[Arvind Jayant](#) & [Neeru](#)

Chapter | [First Online: 22 August 2019](#)

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Part of the [Studies in Big Data](#) book series (SBD, volume 64)

Abstract

Sustainability has become a critical issue for both society and businesses globally. With the increase of natural disasters and global issues such as water shortages, acid rain and climate change companies have started focusing on reducing their carbon footprint to ensure that the world's natural resources are sustained for the foreseeable future. Many international and local companies are now looking to incorporate green initiatives into their supply chain management. This has given rise to green supply chain management which is the incorporation of sustainable initiatives into the supply chain of a company. Designing green supply chains (GSCs) requires complex decision support models that can deal with multiple dimensions of sustainability and specific characteristics of products and supply chain. Multi-criteria decision making (MCDM) approaches can be used to quantify trade-offs between economic, social, and environmental criteria i.e. to identify green production options. This study presents a hybrid decision-making approach for group multi-criteria evaluation for green supply chain management (GSCM) implementation criteria, which clubs many green processes with order allocation for dynamic supply chains to cope market variations. More specifically, the developed approach imitates the knowledge acquisition and manipulation in a

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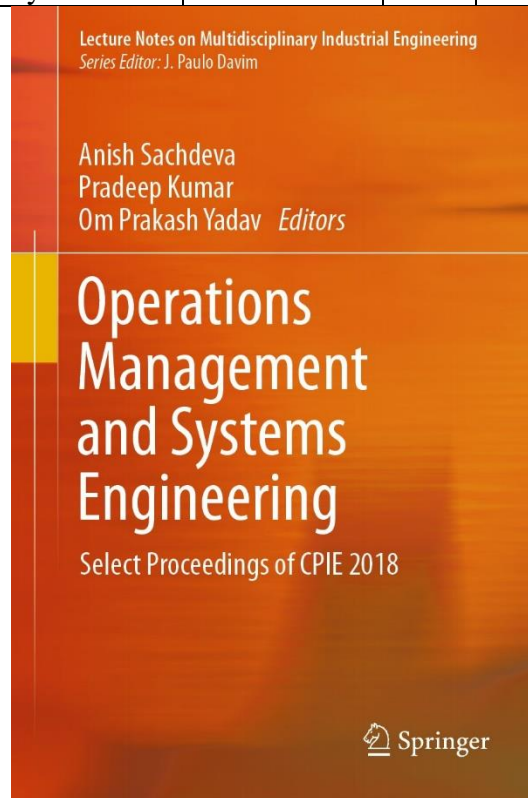
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5	Arvind Jayant, Janpriy Sharma	Operations Management and Systems Engineering	Modelling, Simulation and Optimization of Product Flow in a Multi-products Manufacturing Unit: A Case Study	International	2019	ISBN978-981-13-6476-1.	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
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 **Operations Management and Systems Engineering** pp 185–214 | [Cite as](#)

Modelling, Simulation and Optimization of Product Flow in a Multi-products Manufacturing Unit: A Case Study

Janpriy Sharma  & Arvind Jayant

Conference paper | [First Online: 09 April 2019](#)

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Part of the [Lecture Notes on Multidisciplinary Industrial Engineering](#) book series (LNMUINEN)

Abstract

Simulation is a vital tool for validation of methods and architectures in the complex manufacturing environment before their application on shop floor for the production process. Manufacturing simulation, digital engineering tools and procedures have a positive impact on the manufacturing industry. Simulation models have been extensively used in manufacturing to enhance the design, planning and productivity of the processes. In manufacturing environment, crucial material movement, is controlled by various dynamic factors. Situations become cumbersome for assembling plants which deal with multi-product, owing to the dominance and interconnectedness of dynamic factors. Analysing of these factors in real-life business environment is very complex in nature and required the use of modelling and simulation tools. This chapter glimpses modelling and simulation application, in a multi-product automobile gear manufacturing plant, aimed for development of an efficient production system that expresses ability for assurance of timely product deliveries at minimal cost. For three distinct type of gear production lines, simulation-based models were developed using Arena[®] Simulation Software. The proposed simulation model is capable enough to

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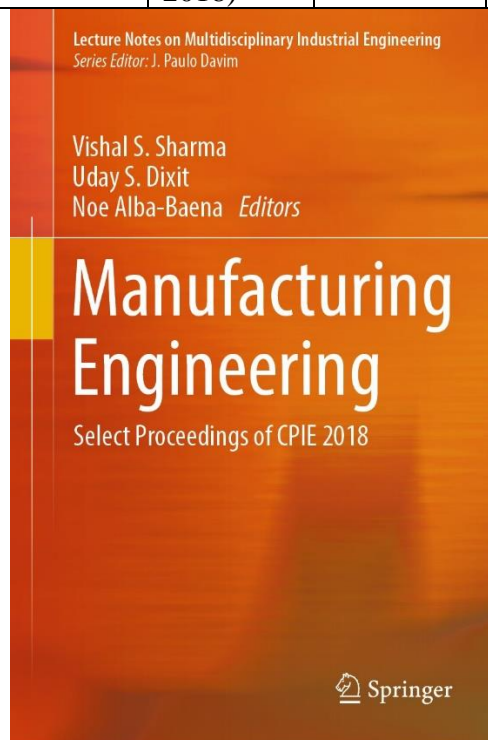
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6	Jitendra Upadhyay, Anuj Bansal, Jagtar Singh	Effect on Mechanical and Metallurgical Properties of Cryogenically Treated Material SS316	Manufacturing Engineering. Lecture Notes on Multidisciplinary Industrial Engineering. Springer, Singapore	Vth International Conference on Production & Industrial Engineering (CPIE 2018)	International	2019	978-981-13-6287-3	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
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Manufacturing Engineering pp 97–107 | [Cite as](#)

Effect on Mechanical and Metallurgical Properties of Cryogenically Treated Material SS316

[Jitendra Upadhyay](#), [Anuj Bansal](#) & [Jagtar Singh](#)

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Part of the [Lecture Notes on Multidisciplinary Industrial Engineering](#) book series (LNMIUNEN)

Abstract

Mechanical components are subjected to wear during their functionality, which decreases the life of such components. The mechanical strength plays a major role for the same. Different heat treatments had been used to improve the mechanical strength of such components. In this paper, DCT (Deep cryogenic treatment) with post-tempering treatment was conducted on austenitic steel SS316 and its effect on mechanical as well as metallurgical properties was investigated through experimental testing's. For post-tempering, two temperatures were selected (T_1 : 350 °C and T_2 : 250 °C). It was observed that the DCT samples with post-tempered treatment at T_2 : 250 °C possess good tensile strength and hardness. The reason behind the same can be refinement of grains after DCT with tempered at T_2 : 250 °C as seen from the microstructural analysis. Further, decrease in toughness was also observed for both the DCT samples. The conversion from austenitic grains to martensitic grains was also observed after DCT.

Keywords

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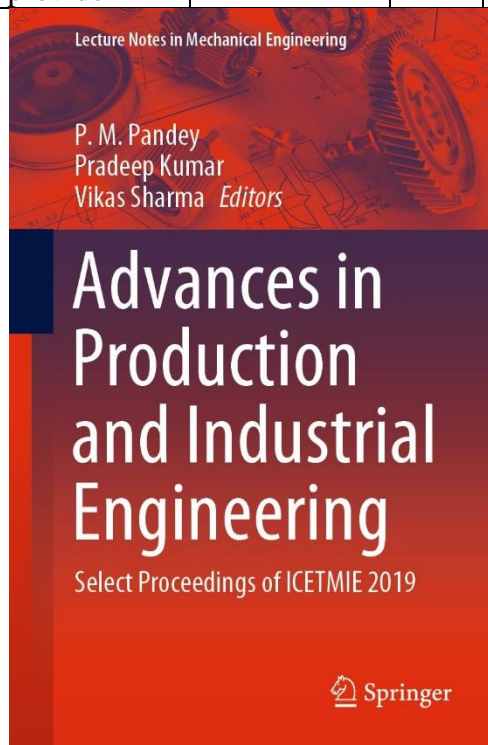
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7	Shweta Singh, Arvind Jayant, Tanmay Walke	Advances in Production and Industrial Engineering. Lecture Notes in Mechanical Engineering	A robust hybrid multi-criteria decision-making approach for selection of third-party reverse logistics service provider	International	2019	2195-4356	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
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 **Advances in Production and Industrial Engineering** pp 423–443 | [Cite as](#)

A Robust Hybrid Multi-criteria Decision-Making Approach for Selection of Third-Party Reverse Logistics Service Provider

Arvind Jayant  Shweta Singh & Tanmay Walke

Conference paper | [First Online: 21 September 2020](#)

480 Accesses | 1 Citations

Part of the [Lecture Notes in Mechanical Engineering](#) book series (LNME)

Abstract

Environmental awareness has universally driven the move for sustainable supply chain management. Accordingly, manufacturing companies or organizations try to seek sustainable business strategies to respond to market pressure toward corporate social responsibility (CSR). Sustainable reverse logistics service provider selection is one of the practical strategies for competitive organizations. With the large-scale development of the automotive products industry, sustainable reverse logistics service provider evaluation method is the key for decision authority when dealing with big data information and possible risks of unstructured data. For instance, the choice of decision authority possibly may responsible for a misleading decision, thus leading to undesirable waste of less available resources and time. Therefore, the objective of present work is to apply the integrated multi-criteria decision methods using the "MOORA and WASPAS" approaches in the evaluation of third-party logistics service providers (3PRLSPs). It also incorporates the significance weight provided by SWARA technique and helps decision-makers for efficient decision-making. The proposed model is to evaluate, and criteria weight is determined using the step-wise weight assessment ratio (SWARA) approach

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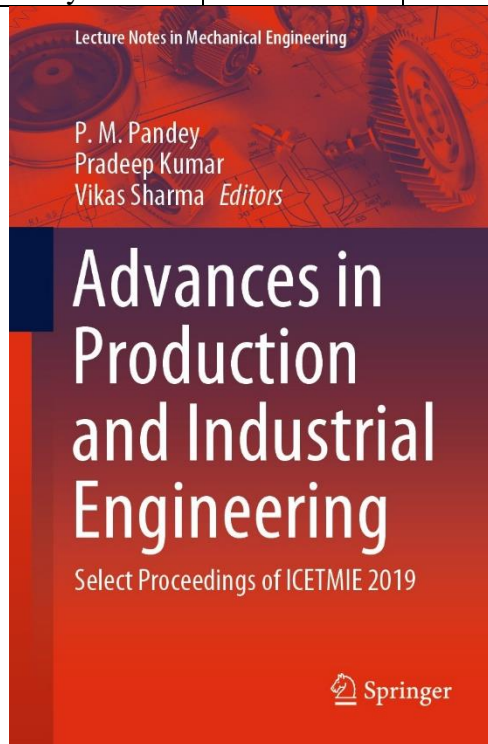
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Advances in Production and Industrial Engineering pp 403–421 | [cite as](#)

Application of Machine Learning Technique for Demand Forecasting: A Case Study of the Manufacturing Industry

[Arvind Jayant](#) [Anshul Agarwal](#) & [Vaibhav Gupta](#)

Conference paper | [First Online: 21 September 2020](#)

624 Accesses | **1** Citations

Part of the [Lecture Notes in Mechanical Engineering](#) book series (LNME)

Abstract

The objective of this work is to develop a machine learning-based Support Vector Machine (SVM) demand forecasting model and its application in supply chain management. The proposed SVM model will predict future demand with high accuracy as compared to the conventional forecasting methods. To demonstrate the effectiveness of the present model, demand forecasting issue was investigated in a piston-manufacturing industry as a real-life case study. In this proposed research, an SVM model is developed using radial basis kernel function and sigmoid function to forecast monthly piston demand for Bajaj Discover motorbikes. Various factors that affect the product demand such as produced units, inventory, sales cost, and the number of competitors have been taken into consideration in the development of the model. A comparative analysis of the SVM model and various traditional forecasting methods used in the company like exponential smoothing, moving average, and autoregressive model has been done and the best demand forecasting model has been recommended to the case company.

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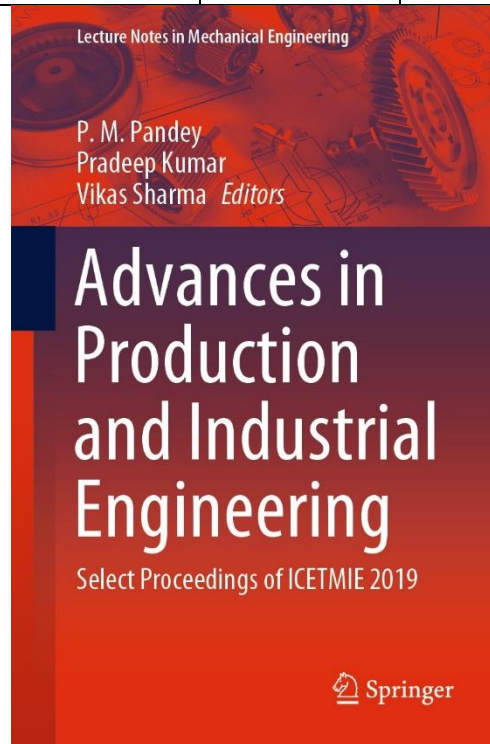
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9	Vivek Gupta, Arvind Jayant	Lecture Notes in Mechanical Engineering (Springer Publication)	Low Carbon Supply Chain Management: A Fuzzy-DEMATEL Analysis of Some Practical Issues of Indian Manufacturing Industries	International	2019	2195-4356.	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
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Recent Advances in Mechanical Engineering pp 33–42 | [Cite as](#)

Low-Carbon Supply Chain Management: A Fuzzy-DEMATEL Analysis of Some Practical Issues of Indian Manufacturing Industries

Vivek Gupta & Arvind Jayant

Conference paper | [First Online: 29 December 2020](#)

550 Accesses

Part of the [Lecture Notes in Mechanical Engineering](#) book series (LNME)

Abstract

Carbon removal is a major task for environmentalists, because of its deep effect on human. Some problems such as inventory control, automatic e-supply chain and customer–consumer interaction techniques are used in machinery and method of apply. To minimize these issues, some hypothesis has been given. These hypotheses are totally based on questionnaires getting from relevant industries. It is observed that there is a big difference between the on paper applied procedure by the top administrative level and the procedure actually applied in the industries. A fuzzy-applied DEMATEL phenomenon is adopted for the recognition of the relationship and importance of different elements actually applied in this paper. The results getting from the hypothesis show the feasibility of the system. So our objectives are to establish the relationship among these various factors using these hypotheses. The last part of the paper ends with the discussion & research proposed by researchers.

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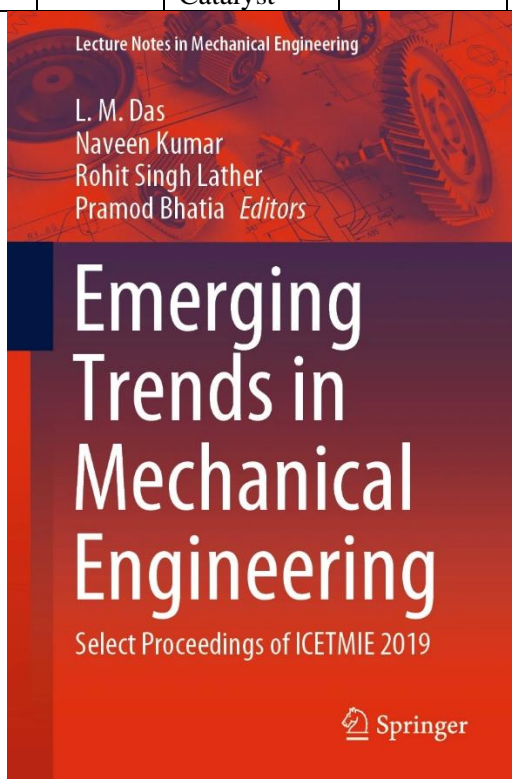
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Emerging Trends in Mechanical Engineering pp 259–278 | [Cite as](#)

Performance and Emission Testing of Diesel Engine Using Blends of Biodiesel from Castor Oil and Neem Oil Prepared Using Lithium-Doped CaO Nano-Catalyst

[Upende r Dhull](#) & [Pardeep Gupta](#)

Conference paper | [First Online: 12 December 2020](#)

294 Accesses

Part of the [Lecture Notes in Mechanical Engineering](#) book series (LNME)

Abstract

Biodiesel has been attracting scientist for near about a century, and new revolutionary research and technical improvement had taken place in this field. But the basic problem of cost involved in using the biodiesel in engine in place of conventional diesel fuel is lying as such till date. In the present research work, it was tried to eliminate this problem by using non-edible oils with natural sourced catalyst optimizing certain set of parameters of best biodiesel performance. The biodiesel was produced from castor oil from highmedia and neem oil secured from S.K. Bioenergy Pune and Paritosh Herbs Ltd., Dehradun, Uttarakhand. A new method of preparation of nano-catalyst lithium-doped CaO obtained from *Musa balbisiana* root has been suggested and used to prepare biodiesel. The characteristics of biodiesel produced were tested according to ASTM standards. Different blends of the biodiesel are produced using castor oil, neem oil and conventional diesel oil. The engine characteristics running on blended fuel were tested on a C.I. Engine. The trials were performed on a four-stroke diesel engine operated utilizing various mixes of oil. Engine speed and load are considered as the parameters of interest. The result is the optimized running condition at

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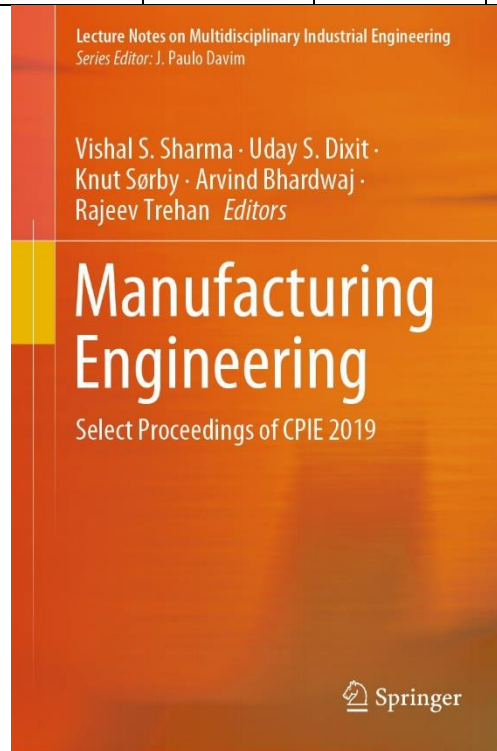
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Design and Development of High-Velocity Submerged Water Jet Cavitation Erosion Test Rig

Anuji Bansal , Jonny Singla, Shivam Pandey & Prem Raj

Conference paper | [First Online: 03 June 2020](#)

491 Accesses | 1 Citations

Part of the [Lecture Notes on Multidisciplinary Industrial Engineering](#) book series (LNMIINEN)

Abstract

Several hydro-machinery components such as impellers of submersible pump, draft tubes and turbine blades generally suffer from cavitation erosion (CE) during their operation, and due to this, service life and capability of such parts are reduced. During the design and development of these components, test rigs are usually required to evaluate their performance. In the present research work, keeping in view the economic aspects, out of different test rigs available, it is proposed to use high-velocity submerged water jet cavitation erosion test rig. The test rig was designed with flexibility in cavitation erosion parameters (velocity, angle of attack, stand-off distance, nozzle diameter) and fabricated with an aim to test the cavitation erosion of hydro-machinery steel under different cavitation erosion parameters. Calibration of the test rig was done for jet velocity, stand-off distance (SOD) and angle of attack. The CE rate of steel SS410 was evaluated using the fabricated test rig under different operating parameters consists of 3 velocities and 3 stand-off distance, keeping the other parameters like angle of attack as 90° and nozzle diameter as 3 mm. The test rig was capable of producing CE as observed from the specimen microstructure. From the microstructure analysis, the pits produced during the CE are clearly visible. The CE rate was found to be maximum for a

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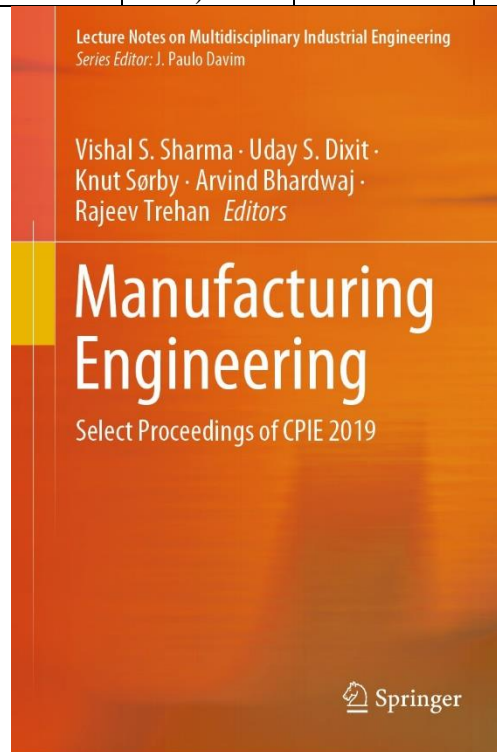
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Effect of Cryogenic Treatment on Mechanical and Metallurgical Properties of SS410

[Amrinder Singh](#), [Anuj Bansal](#) , [Jagtar Singh](#) & [Anil Kumar Singla](#)

Conference paper | [First Online: 03 June 2020](#)

469 Accesses | 1 Citations

Part of the [Lecture Notes on Multidisciplinary Industrial Engineering](#) book series (LNMUINEN)

Abstract

Martensitic grade SS410 is used extensively for manufacturing of turbine blades and other hydro-machinery components. During working of such components, due to poor mechanical properties of the material, the components lose its functionality and life of such components decreases. In this regard, the improvement in the material properties is essential, to enhance the life of such components. For improving the mechanical and metallurgical properties of the material, deep cryogenic treatment (DCT) can be effectively used. In this research work, DCT followed by tempering at two temperatures 350 and 250 °C has been performed on SS410. The SS410 specimens with and without DCT were tested for tensile strength, toughness, and micro-hardness. It has been observed that DCT followed by post-tempering at 250 °C has shown better results in terms of ultimate tensile strength (UTS) and micro-hardness as compared to its counterparts. This may correspond to the conversion of retained austenite to martensite and formation of fine secondary carbides.

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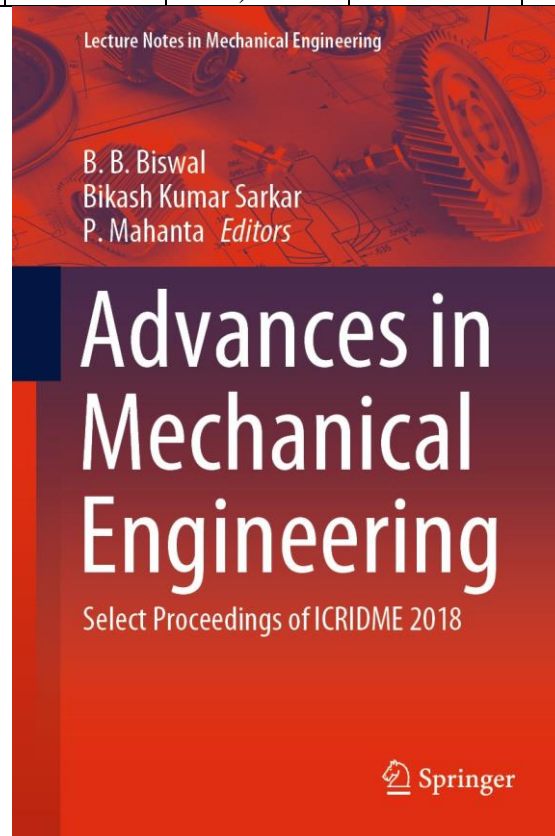
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Advances in Mechanical Engineering pp 281–293 | [Cite as](#)

Thermomechanical Analysis of Al-7075 to Predict Residual Stresses by Using 3D Finite Element Simulation

Ankit Saxena & Ravindra K. Saxena

Conference paper | [First Online: 17 January 2020](#)

1592 Accesses

Part of the [Lecture Notes in Mechanical Engineering](#) book series (LNME)

Abstract

Newer research and simulation tools are one of the advances in alloy manufacturing which allows prediction of final microstructure, residual stresses, and fatigue behavior before actual processing. Experimental procedures of measuring residual stresses using latest technology such as neutron X-ray diffraction techniques, ultrasonic technique, are tedious and expensive. In this paper, an approach is presented to predict residual stress behavior for block of different size as well as shape under thermomechanical loading for Al-7075 alloy block. Computer simulation was used as a tool in order to perform above task. Patran™ and Nastran™ finite element software was used. The predicted residual stresses are compared with experimental and simulated measurements. Outcomes signify that predicted values are in good accord with experimental and simulated measurements. It is found that material is experiencing compressive residual stresses at the surface and tensile residual stresses in the core due to thermal cycles and edge effect.

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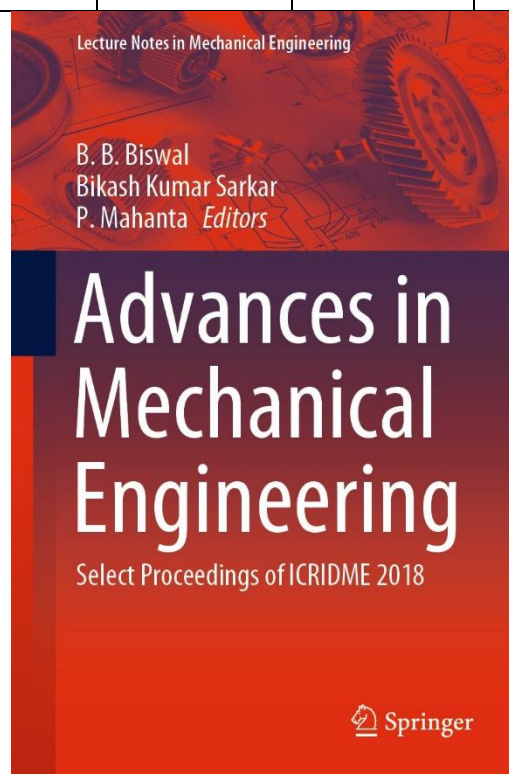
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Advances in Mechanical Engineering pp 307–320 | [Cite as](#)

Finite Element Based Prediction of Transient Temperature Distribution, Heat Affected Zone and Residual Stresses in AISI 304 Stainless Steel Weldment

[Gurdeep Singh](#) [Bavindra K. Saxena](#) & [Sunil Pandey](#)

Conference paper | [First Online: 17 January 2020](#)

1583 Accesses

Part of the *Lecture Notes in Mechanical Engineering* book series (LNME)

Abstract

The welded joint is susceptible to failure due to the presence of entrapped residual stresses. Welded joint is subjected to high intensity of concentrated heat moving at defined speed along a path. The material is subject to transient temperature variations. The transient temperature variations give rise to uneven heating and subsequent cooling. The material experiences an uneven tensile and compressive residual stresses under these changing temperature conditions. The situation becomes trivial under multi-pass welding. In the present work finite element method is employed to calculate the temperature distribution, heat affected zone and resulting residual stresses during MMAW welding. Element birth and death technique is apply to simulate the flux deposition. The results on temperature distribution are in reasonably good validated with the experimental results. It is observed that there is relative increase in the magnitude of residual stresses with the similar relative increase in temperature.

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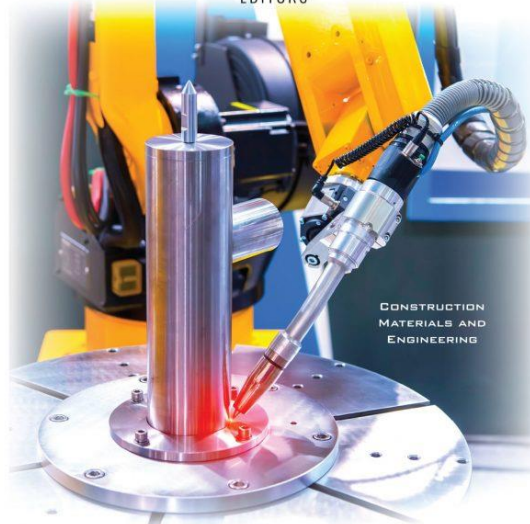
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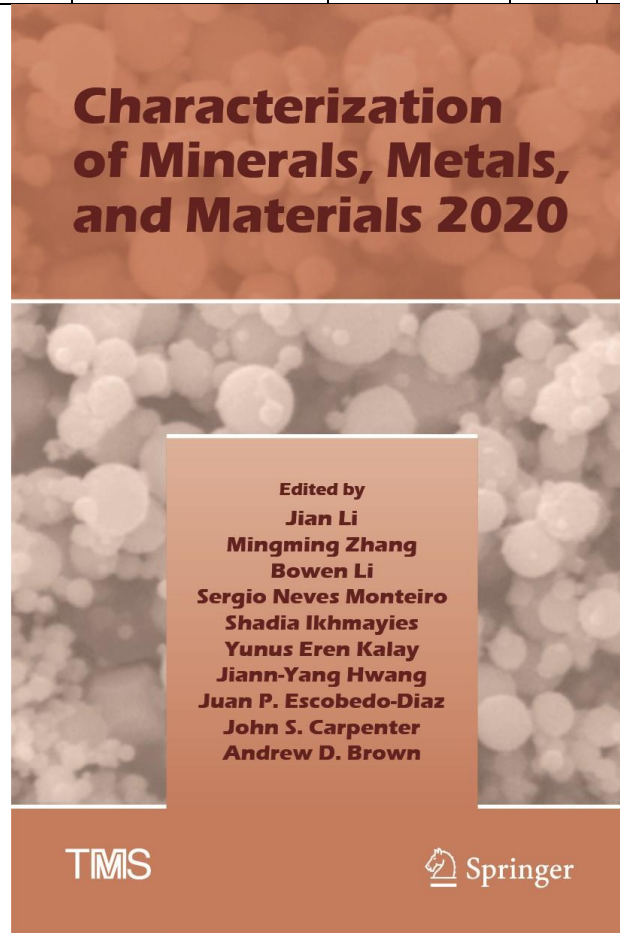


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 **Characterization of Minerals, Metals, and Materials 2020** pp 251–260 | [Cite as](#)

Effect of Dual Phase Stabilization via Varying Ti/Nb Ratios on the Pitting Behavior of AISI 347 Welds

A. S. Shahi  & Dikshant Malhotra

Conference paper | [First Online: 24 January 2020](#)
1488 Accesses

Part of the [The Minerals, Metals & Materials Series](#) book series (MMMS)

Abstract

The aim of the present work was to study the role of Ti additions made to Nb contained stabilized austenitic stainless steel grade AISI 347 welds for improving their metallurgical stability and pitting corrosion resistance. For achieving this, gas tungsten arc welding process (GTAW) was used to fabricate multi-pass and multi-layer weld pads comprising of 28 weld passes; and using AISI 347 (Nb based) and AISI 321 (Ti based) solid fillers in a systematic combination, so as to obtain different weld metals' surfaces with varying Ti/Nb ratios of 0.45, 0.66, and 1.57. These surfaces were examined for their pitting behavior using electrochemical method, an electron probe microanalyzer (EPMA) equipped with a wavelength dispersive X-ray spectrometer (WDS) for chemical composition analysis, and X-ray photoelectron spectroscopy (XPS) depth profiling of passive films. Austenitic stainless steel welds with Ti/Nb ratio of 0.45 exhibited maximum pitting potential of 380.5 mV_{SCE} as compared to sole Nb weld with 270.7 mV_{SCE}. The atomic concentration profiles of oxygen across different weld surfaces indicate that estimated passive film thickness values for sole Nb (347 weld metal) and Nb weld stabilized with Ti/Nb ratio of 0.45 were calculate to be 8.43 nm and 7.11 nm, respectively. Ti addition suppressed the carbide formation tendencies resulting in higher levels of Ni in the

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Advances in Engineering Design pp 225-237 | Cite as

An Effect of Current on Mechanical Properties and SEM Characterization of Butt Joint of Aluminium AA6082 Using GTAW

Sunil Kumar Prabhkiran Kaur & Amrik Singh

Conference paper | [First Online: 05 February 2021](#)

398 Accesses

Part of the [Lecture Notes in Mechanical Engineering](#) book series (LNME)

Abstract

Aluminium alloys are almost vital in most of the lightweight components made by most of the joining processes. Most influential property of these alloys is corrosion resistance. Welding is one of the most reliable joining processes of aluminium alloys, especially for structural components. Joining of aluminium alloys is accomplished by tungsten inert gas welding (TIGW) as it is relatively easier to apply, better and low-cost. In the present study, welding parameter current has been studied for butt joining of Aluminium Alloy 6082. The extensive range for current has been studied through numbers of execution of trials. Further, mechanical properties (tensile and impact) and SEM have been analysed, and the optimal current has been found.

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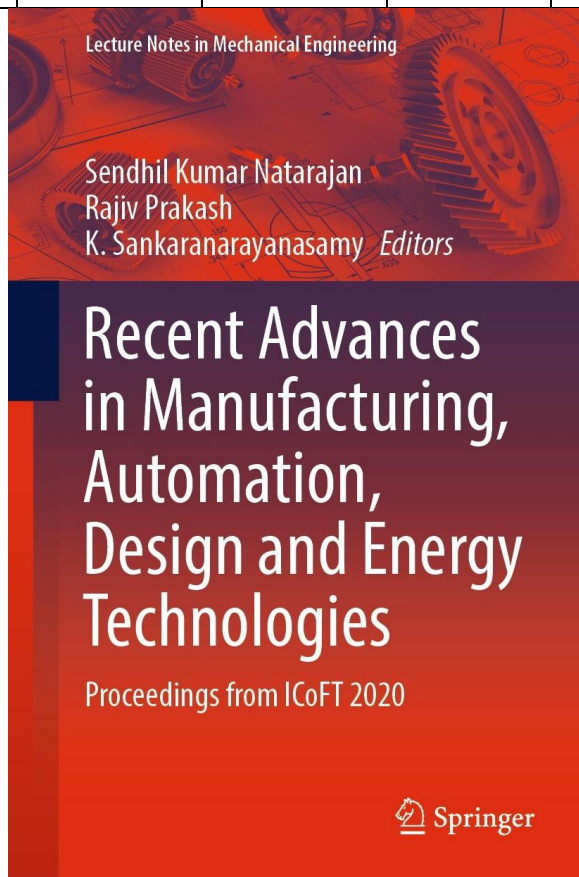
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Recent Advances in Manufacturing, Automation, Design and Energy Technologies (p 955-964) | [Cite as](#)

Harvesting Electric Energy from Waste Vibrations of an Electric Motor Using the Piezoelectric Principle

Nitin Yadav¹ & Rajesh Kumar¹

Conference paper | [First Online: 12 October 2021](#)

901 Accesses | 1 Citations

Part of the [Lecture Notes in Mechanical Engineering](#) book series (LNME)

Abstract

Continuously increased requirement of electricity because of population, higher living standards, and the human race in automation directs the world to use the waste and non-conventional sources of energy. In the present work, unwanted vibration from an electric motor is used to generate electric power with the help of the piezoelectric element. Piezoelectric is a special class of dielectric which generates electric power because of their structural deformation under force and vibration. The piezoelectric material lead zirconate titanate (PZT) is mounted between the electric motor's base and foundation. The output of the piezoelectric element is measured under three different conditions of the motor operation such as (a) idle running, (b) loaded with a grain-grinding machine, and (c) loaded with a chaff cutter machine. The maximum power generated from diaphragm-type single piezoelectric element was 48.05 μW when the motor was connected to a chaff cutter. To increase power output, two pieces of piezoelectric elements are connected in series and parallel connection. The power output obtained from two piezoelectric materials connected in series and parallel is 102.86 and 151.81 μW , respectively, for the same chaff cutter. Further, the effect of both the connections is studied in laboratory conditions. Results are comparable with field experiments.

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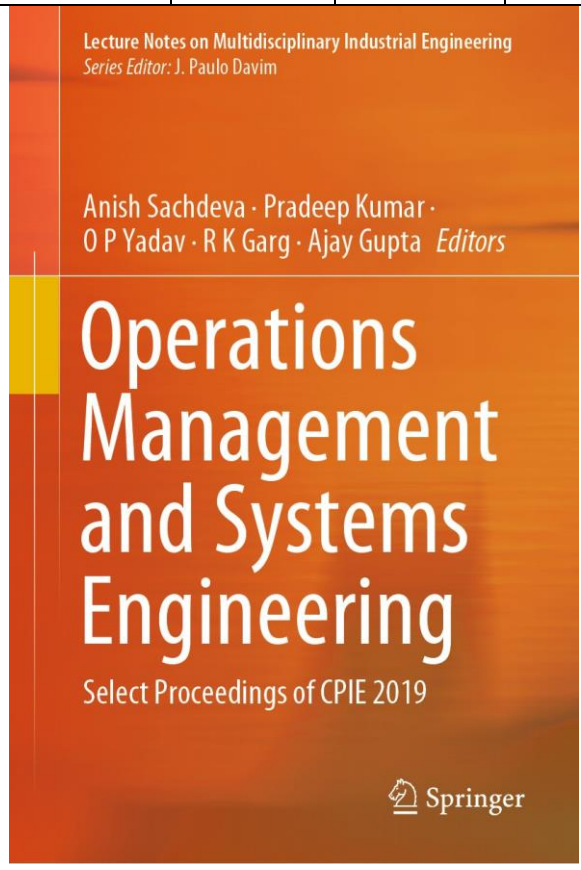
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21	Pardeep Gupta and Sumit Kumar	Productivity Improvements in an Indian Automotive OEM Using Heijunka, A Lean Manufacturing Approach: A Case Study	Lecture Notes on Multidisciplinary Industrial Engineering	6 th International conference on Production & Industrial Engineering	International	2021	ISBN 978-981-15-6016-3 ISBN 978-981-15-6017-0 (eBook)	Sant Longowal Institute of Engineering and Technology, Longowal	Springer
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Productivity Improvements in an Indian Automotive OEM using Heijunka, A Lean Manufacturing Approach: A Case Study

Pardeep Gupta & Sumit Kumar

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Abstract

This paper discusses the role of implementing Heijunka, a Lean manufacturing tool in improving the productivity of Indian automotive industry. Lean manufacturing is a business excellence strategy centered around waste reduction through continuous improvement resulting in improvement of productivity, competitiveness, quality causing greater customer satisfaction. Heijunka is aimed at smoothing the production and subsequently creating the opportunities to improve manufacturing environment. It prepares the industries to face the demand which is about to generate in the near future. The study reveals that the results of Heijunka implementation are quite substantial in terms of improvement in quality, productivity and customer satisfaction. The industry under the study transitioned its old-fashioned production system into tired production system. This was done to ensure pull production system. Heijunka flow was established in all the tiers in order to ensure smooth flow of the material without any unwanted inventory. Owing to the above changes industry reported

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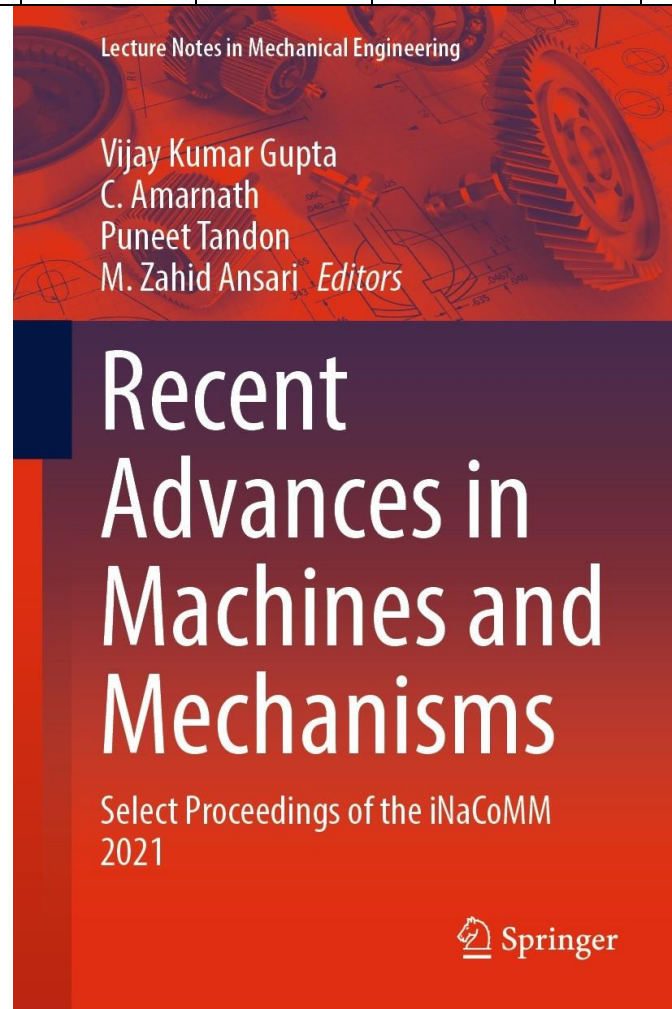
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Classification of Worm Gearbox Fault Using Dendrogram Support Vector Machine

Surinder Kumar & Rajesh Kumar

Conference paper | [First Online: 04 October 2022](#)

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Abstract

Worm gearbox has wide range of applications such as in agitators, crushers, mixers, elevators, extruders, and cranes. The fault in gearbox leads to breakdown of the machinery. Early detection of fault in worm gearbox can prompt for economical preventive maintenance which ultimately prevents the breakdown and the production losses. Classification of the fault of worm gear is the first step of ensuring the gearbox protection. In this paper, a robust classification scheme based on autoregression minimum entropy deconvolution (AR-MED) and dendrogram support vector machine (DSVM) has been proposed to classify the faults of worm gearbox. AR-MED filter is used to remove the regular pattern of the gear and enhance the periodic impulsiveness in the signal. Features have been extracted from the filtered signal and used as input in DSVM model for multiclass classification of the fault conditions of worm gearbox. Results reveal that effectiveness of classification of DSVM has been enhanced using AR-MED filter with 100% decoding accuracy.

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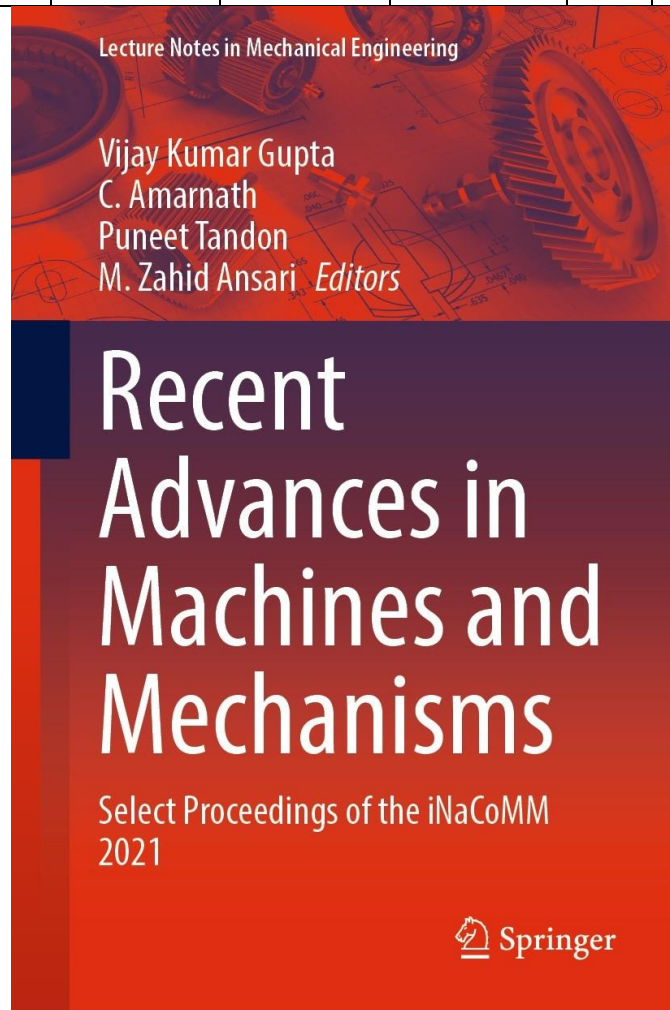
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Govind Vashishtha & Rajesh Kumar

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Abstract

Fault diagnosis of the rotating machinery using vibration signal is largely carried out by experience with some prior knowledge of the signal. The diagnosis process is simplified by using machine learning algorithms. The learning capabilities and classification performance of such machine learning models are mostly influenced by the quantity and quality of the input features. Thus, the appropriate selection of a subset of the most prominent features for machine learning becomes essential to eliminate redundancy of high dimension or irrelevant measurements of the features. In this paper, a filter-based feature selection technique is introduced to select the optimal feature space. A Gaussian ant lion optimization (GALO) is put in with a filter-based selection technique to select the feature subset from a high dimension feature dataset obtained from the vibration signals of centrifugal pump under different health conditions (normal, clogging, wheel cut and blade cut). The K-nearest neighbour (KNN) classifier is applied to the selected feature subset to find the classification accuracy. In addition, the proposed method has been compared with other art of work. The results reveal

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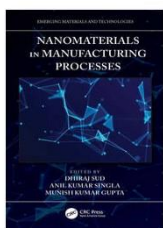
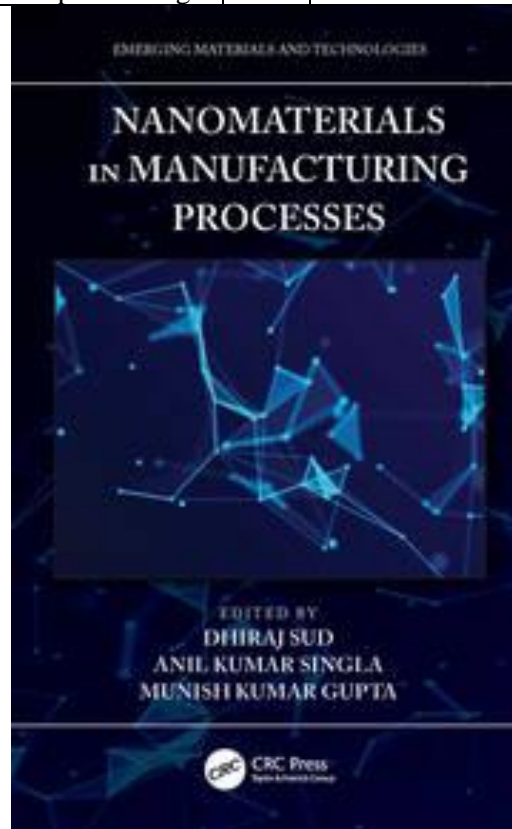
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By Jonny Singla, Anuj Bansal, Anil Kumar Singla, Deepak Kumar Goyal

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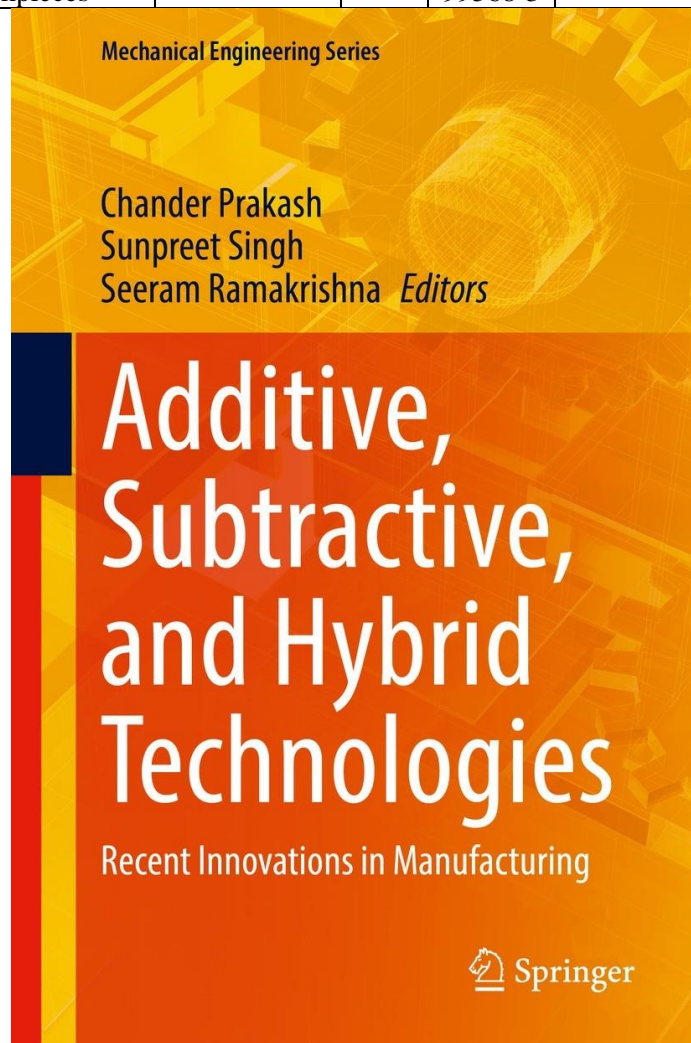
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