Curriculum Vitae

Personal

Name	Dr Amit V Sata
Date of birth	17th July, 1979
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Sex	Male
Nationality	Indian
Address	"Shubh Laxmi", Plot No 44, Jivraj Park, Inside Ambika Township Rajkot – 360 005

Education

Degree	University / Education Board	Institute	Year	Performance
PhD	IIT – Bombay	IIT–Bombay	2010 – 2015	9.25/10 (CPI)
MTech	IIT - Bombay	IIT–Bombay	2008– 2010	8.8/10 (CPI)
B.E. (Mech.)	Saurashtra University	VVPEC –Rjt	1996 – 2000	71 %
H.S.C	G. S. E. B	SVP-Rjt	1996	70 %
Matriculation	G. S. E. B	SGV- Rjt	1994	69 %

PhD Title and Abstract

Prediction and Analysis of Defects and Mechanical Properties of Investment Casting *under the supervision of* ***Dr. B. Ravi*** *(Institute chair professor, IIT Bombay)*

Metal parts with intricate shapes and thin walls can be economically produced by investment casting process. It involves creating a ceramic shell around a wax pattern, melting out the wax, pouring liquid metal in the heated shell, and removing the solidified part after breaking the shell. These parts are used in automobile, aerospace, chemical, biomedical and other critical applications; they are required to be free of defects and possess the desired range of mechanical properties. In practice, this is a big challenge, since there are large number of parameters related to process and alloy composition; their values change for every casting, and their effect on quality is not very well understood. A large number of castings are therefore rejected, repaired or recycled, leading to wastage of production resources. There is a need for a systematic approach for prediction and analysis of defects as well as mechanical properties of investment castings, which can be easily implemented in industrial foundries.

A survey of 20 investment casting (IC) foundries located in Rajkot cluster in Western India was first carried out to understand their capabilities and quality issues. A hierarchical methodology for systematic categorization of major IC defects, such as ceramic inclusion, flash, misrun, shrinkage, and slag inclusion was developed. Several different models were evolved to predict these defects using Artificial Neural Network (ANN) and Multivariate Regression (MVR). The models were trained using a large amount of data related to process parameters, alloy composition and occurrence of defects, collected from an industrial IC foundry. Principal component analysis was employed to reduce the redundancy in data, resulting in faster computations. The models were tested on a portion of the foundry data kept aside for the purpose, and their prediction accuracies were compared. A similar approach was evolved for prediction of mechanical properties (ultimate tensile strength, yield strength, and percentage elongation) of investment cast parts. The ANN (with LM

training algorithm) gave better prediction of defects, while MVR gave better prediction of mechanical properties.
A probabilistic approach based on Bayesian inference was developed to analyze the defects and to find critical parameters (along with their avoidable range of values) to minimize their future occurrence. A similar approach was developed to analyze the values of mechanical properties, and determine the critical parameters (along with their preferred range of values) to obtain the desired properties. The methodology for prediction and analysis of defects as well as mechanical properties was further validated by applying the models (without any further training or customizing), to a different casting produced in the same foundry, but with slightly different values of process parameters and alloy composition. The entire methodology was found to be easy to implement and use by foundry engineers, unlike process simulation, which requires a high level of inputs (3D models, property data, etc.), domain knowledge and interpretation experience. This work has proved the feasibility and value of process data driven analysis, optimization and control, and is expected to pave the way for more work in this direction. That is also expected to benefit the industry.

Dissertation Title and Abstract

Shrinkage Porosity Prediction using Casting Simulation *under the supervision of* ***Dr. B. Ravi*** *(Institute chair professor, IIT Bombay)*

Shrinkage porosity is one of the most common defects in castings. Various existing techniques of shrinkage porosity prediction like modulus and equi-solidification time and criterion function have been reviewed. Various criteria functions including Niyama criterion, dimensionless Niyama criterion, Lee et al. criterion and Franco criterion for prediction of shrinkage porosity have been studied in this work.
From literature, L shape casting has been analyzed for predicting location of shrinkage porosity using solidification simulation. Simulation result is comparable with available experimental result. Threshold values of Lee et al., Davis, Franco and Bishop criterion for cast steel have been established by comparing results with Niyama criterion.
Benchmark casting, a combination of three T-Junction, has been cast and analyzed to understand dependency of shrinkage defect size on geometric parameters and thermal parameters. The experiments were carried out for Ductile iron (500/7), plain carbon steel (1005 steel) and stainless steel (SS 410). These experimental data are used to set limiting temperature gradient values in AutoCAST®. Further, simulation experiments were carried out by varying thickness ratio from 0.25 to 1.5. The result of experiments and simulations are used as input to regression analysis to evolve a set of empirical equations to predict shrinkage porosity defect size in T junction considering the effect of geometric parameter alongwith thermal parameters. Further, an empirical model of SS 410 is validated by casting of T junction which is having thickness ratio and length ratio of 1.75 and 5 respectively. The predicted size of shrinkage defect is approximately matching with observed size of defect.

Professional Experience

01/12/2016 – *Present*
Associate Dean (Innovation & Entrepreneurship) & Professor
Mechanical Engineering Department, Marwadi University - Rajkot

01/01/2013 – 30/11/2016
Professor
Mechanical Engineering Department in BHGCET- Rajkot

04/08/2011 –31/12/2012
Assistant Professor
Mechanical Engineering Department in Om Shanti Engineering College- Rajkot

25/11/2002 –03/08/2011
Lecturer
Mechanical Engineering Department in VVP Engineering College- Rajkot

1/1/2002 – 31/08/2002
Assistant Customer Care Manager
Cargo Motors Guj. Pvt. Ltd. – Rajkot (An Authorized workshop for the Maruti vehicle)

1/12/2000 – 31/12/2001
Production Incharge
Dipak Metals – Rajkot (Manufacturer of wide range of Quality Kitchenware Products)

1/8/2000 – 30/11/2000
Quality Control Engineer
Rajan Techno Cast Pvt. Ltd. – Shapar (Manufacturer of High Precision Investment Casting)

Research Interest

- Manufacturing engineering
- Metal Casting
- Industrial Internet of Things (IIoT)
- Manufacturing Data Analytics
- Artificial Intelligence
- SMART manufacturing
- Digital Twin
- Metaverse Enabled Manufacturing Systems

Academic Contributions

- Developed course on Manufacturing Process focused on implementation of project-based learning.
- Proposed minor course of one year on **SMART Systems** at under-graduate level. Also, proposed post-graduate course of two years on **SMART Systems**.
- Identified more than 75 technical skills focused on industrial needs, and necessary to be imparted in mechanical engineers to strengthen skill domain of engineers. Also, Initiated Centre for Skill Enhancement (CSE) focused on imparting technical skills to mechanical engineering students

Funded Projects & Grants

Year	Details
2023-26 (*Under review*)	**Synergic Integration of Smart Innovations in Investment Casting for High Valued Products** submitted to Department of Science & Technology (India) under TDT (AMT)
	Overall goal is to synergically integrate smart innovations in investment casting process for producing high valued products required in aerospace and defense sectors
	Principal Investigator, Funding: INR 606.11 lacs
2023-24	**Development of Novel Wellness System for Diagnosing Specific Wellness Related Issues Using Image Processing and Pulsation** funded by Kankesh Pharmacy LLP - Viramgam
	Overall goal is to develop a system that will diagnose specific wellness related issues (obesity, diabetic, acidity, etc) through fundamentals of AI, and suggest relevant remedies.
	Principal Investigator, Funding: INR 6.87 lacs

Year	Details
2023-24	**Enhancing Ceramic Slurry Related Properties for Investment Casting Process**
	Overall objective is to identify critical parameters affecting mechanical and biological properties of slurry used in shell making process in investment casting funded by King Khalid University – Kingdom of Saudi Arabia under group related to Characterization of Novel Materials Processed Using Advanced Technology.
	Co-Principal Investigator, Funding: 24000 SAR (nearly INR 5 lacs)
2022-23	**Development of Entrepreneurship Capacity Building Cell (ECBC) for Innovation, Incubation and Research** submitted to Savli Technology and Business Incubator (STBI) – Savli
	Overall objective is to establish ECBC at Marwadi University to promote startups in the domain of health care
	Dy Coordinator, Funding: INR 10 lacs
2016-2021	**SMART Foundry 2020** (Sustainable Metalcasting using Advanced Research and Technology) of 9.24 crore (Nearly $1.25 million) funded by Department of Science & Technology (India) under Technology Systems Development Programme (TSDP)
	Overall goal is to develop a Smart Foundry that can be used to rapidly create small intricate metal parts required in tiny order quantities
	Co-Principal Investigator – Module E (Process Monitoring and Data Analytics), Funding: INR 36.21 lacs
2017-2022	**RAPID Casting** funded by Centre for Entrepreneurship Development, Government of Gujarat under scheme 2 (Short-term bridge course by industries/institute).
	Overall goal is to set up skill enhancement center for imparting technical skills related to rapid product development in metal casting.
	Principal Investigator, Funding: INR 100 lacs
2019	Founded innovative startup **Udhyog 4.0 LLP** that has been further selected as one of the most innovative startups by Government of Gujarat (India)
	Overall goal is to transform existing manufacturing enterprises into SMART manufacturing enterprise by indigenously developed modules including process monitoring, data management and data analytics at very affordable cost
	Founder, Funding: INR 20 lacs
2023	**Investment Casting Complexity Analysis System** funded by New Generation Innovation and Entrepreneurship Development Centre (NewGen IEDC) - Gandhinagar
	Overall goal is to develop investment casting complexity analysis system that provides an insight about complexity involved in investment casting to designer, and further provides an idea about cost involved in manufacturing of investment casting.
	Mentor, Funding: INR 1.75 lacs
2023	**Development of Antibiotics for Preventing Microorganisms Growth in Slurry Used in Investment Casting** funded by New Generation Innovation and Entrepreneurship Development Centre (NewGen IEDC) - Gandhinagar
	Overall goal is to develop antibiotics to prevent growth of harmful microorganism that can be added into ceramic slurry used in shell building process for investment casting.
	Mentor, Funding: INR 1 lac
2023	**IoT Gateway for CNC machine** funded by New Generation Innovation and Entrepreneurship Development Centre (NewGen IEDC) - Gandhinagar
	Overall goal is to plug and play device for transforming existing CNC into SMART CNC machine that will further provide real time monitoring over machining process.
	Mentor, Funding: INR 0.75 lac

Year	Details
2022	**Development of IoT Enabled Oxygen Concentrator** funded by New Generation Innovation and Entrepreneurship Development Centre (NewGen IEDC) - Gandhinagar
	Overall goal is to develop IoT enabled oxygen concentrators using multi-disciplinary approach that will supply pure oxygen to multiple patients during the pandemic situation.
	Mentor, Funding: INR 1.6 lacs
2022	**Stubble to Sanitary Pads** funded by New Generation Innovation and Entrepreneurship Development Centre (NewGen IEDC) - Gandhinagar
	Overall goal is to develop sanitary pads using cellulose extracted from stubble related to wheat and rice remained unutilized at the end of season.
	Mentor, Funding: INR 1.5 lacs
2021	**Intelligent Inspection Device for Metal Casting** funded by New Generation Innovation and Entrepreneurship Development Centre (NewGen IEDC) - Gandhinagar
	Overall goal is to develop intelligent inspection based on fundamentals of artificial intelligence that measures overall dimension and identifies surface related defects in metal casting.
	Mentor, Funding: INR 2 lacs
2021	**IoT Enabled Jewellery Casting** funded by New Generation Innovation and Entrepreneurship Development Centre (NewGen IEDC) - Gandhinagar
	Overall goal is to develop SMART jewellery casting setup that can be operated and controlled using SMART devices
	Mentor, Funding: INR 2 lacs
2021	**Extending an application of AR/VR to Engineering Education** funded by New Generation Innovation and Entrepreneurship Development Centre (NewGen IEDC) - Gandhinagar
	Overall goal is to extend an application of AR/VR to professional education, and create metaverse practical work.
	Mentor, Funding: INR 2 lacs
2020	**IoT Enabled Testing Devices for Investment Casting** funded by New Generation Innovation and Entrepreneurship Development Centre (NewGen IEDC) - Gandhinagar
	Overall goal is to develop IoT enabled testing and measurement devices for investment casting industries.
	Mentor, Funding: INR 1.9 lacs

Technical Contributions

- *Member of Indian Foundry Journal Editorial Committee*
- *Member of Entrepreneurship Cluster - IUCEE: Indo Universal Collaboration for Engineering Education*
- *Council member of Confederation of Indian Industry (CII) - Western Gujarat Zonal*
- *Council member of The Institute of Indian Foundrymen – Rajkot Chapter*
- *Member of ISO IEC/Joint Technical Committee (JTC)*/Subcommittee (SC)36 (Working Group 7) focuses on development of international standards related to Information technology for learning, education and training; *ISO IEC/JTC*/SC41 (Working Group 5) focuses on development of international standards related to Internet of Things & Digital Twin; *ISO IEC/JTC*/42 (Working Group 2 & 4) focuses on development of international standards related Artificial Intelligence
- *Member of* Information technology for learning, education and training *(LITD19), Internet of Things (IoT) related technologies Sectional Panel (LITD 27) & Artificial Intelligence Sectional Panel (LITD 30)* under Bureau of Indian Standards (BIS)-India
- *Member of Editorial Board* - American Journal of Neural Networks and Applications; International Journal of Industrial and Manufacturing Systems Engineering
- *Topic Organizer*-International Mechanical Engineering Congress & Exposition (ASME-IMECE 2017), USA
- Part of executive committee for ASME IMECE Track on Safety Engineering Risk Analysis Division (SERAD)
- *Member of Scientific Committee*-International Conference on Applied Mechanics, Electronics, and Mechatronics Engineering (AMEME 2016), China
- *Chairperson (Technical Session)*-Indian Foundry Congress 2016, India

- *Peer Reviewer*-International Mechanical Engineering Congress & Exposition (ASME-IMECE 2017,2016,2015 & 2014), USA; CHARUSAT Journal (A scientific research publication from Charotar University of Science and Technology-Changa

International Exposures

- Visited Caucasus University (CU), Georgian Aviation University (GAU), International Black Sea University (ISBU), and Georgian Institute of Public Affairs (GIPA) during 15-24 December 2023 for collaboration with Marwadi University. Lead in Signing MoU with GAU and ISBU for collaboration in the direction of student exchange, faculty exchange, research, innovation, and entrepreneurship.
- Nominated for **Teaching Mobility Program** under ERASMUS+ program during 7-11 May 2018 at University of Pitesti, Romania
- Presented research work on 9 November 2017 during ASME IMECE 2017 at Tampa, USA
- Presented research work on 24 May 2016 during World Foundry Congress at Nagoya, Japan

Collaborations

- Played instrumental role in initiation of collaboration with Georgian universities including Caucasus University (CU), Georgian Aviation University (GAU), International Black Sea University (ISBU), and Georgian Institute of Public Affairs (GIPA)
- Initiated collaboration with Central Manufacturing Technology Institute (CMTI) – Bengaluru, and National Institute of Advanced Manufacturing Technology (NIAMT) – Ranchi for the domain of manufacturing innovations.
- Initiated collaboration with Savli Technology and Business Incubator (STBI) - Vadodara for the domain of healthcare innovations.
- Initiated collaboration with Athravam Venture Private Limited - Rajkot for providing to startups incubated at Marwadi University.
- Initiated collaboration with Gorecha Metal Tech - Rajkot for providing platform for implementing research conducted in the domain of investment casting.

Awards & Recognition

- ***Soli Commissariat Award*** during 71st Indian Foundry Congress held during 8-10 February, 2023 at Greater Noida
- ***Chandran Menon Memorial Award for Applied Research and Innovative Technology*** for the year 2021-22 by **The Institute of Indian Foundrymen (IIF)** during 71st Indian Foundry Congress held on 9 February, 2023 at Greater Noida
- Got Felicitation for founded startup ***Udhyog 4.0*** by **Honorable Union Minister of Skill Development and Entrepreneurship Shri Rajeev Chandrasekhar** during his visit at Marwadi University under initiative New India for Young India on 4 October 2022
- ***Best Paper Award*** during *5th International Conference on Advances in Steel, Power and Construction Technology* held during 15-17 June 2022 at Raigarh (India)
- ***Best Innovator Award*** for the year 2021 by Marwadi University
- ***Best Paper Award*** during *2nd International Conference on Computational Intelligence in Data Science (ICCIDS-2019)* held during 21-23 February, 2019 at Chennai
- Received ***International Travel Support (ITS)*** under Science and Engineering Research Board (SERB) for presenting research work in **International Mechanical Engineering Congress & Exposition (IMECE) – 2017** held during 1-10 November 2017 at Tampa (Florida), USA
- Awarded with $1000 and five-years membership by American Society of Mechanical Engineers (ASME) for mentoring the project ***Innovative Multi-Axis Wind Turbine*** that won **Best Overall Impact/Utility** under **Mixed Software Category** at **Innovative Design Software Challenge (IDSC) 2016** organized by ASME at Charlotte, US during 21-24 August 2016

Knowledge Transfer

- **Supervising** PhD Students (7) focused on extending an application of IoT to manufacturing engineering, and **guided more than 40** undergraduate & postgraduate projects in different domains
- **Mentoring** startups including IoT Enabled Testing labs, Intelligent Inspection Devices for Metal Casting and Ceramic Industries, IoT Enabled jewellery Casting, IoT Enabled Oxygen Concentrators, and Stubble to Sanitary (S2S).

Transfer of Technologies

- **Transferred the Technology** related to IoT Enabled Vertical Centrifugal Casting & Bottom Pouring Resistance Melting Furnace developed at Marwadi University as a part of government funded project SMART Foundry 2020 to National Institute of Advanced Manufacturing Technology (formerly known as the National Institute of Foundry and Forge Technology) – Ranchi
- **Transferred the Technology** related to Software on Intelligent Inspection System for Metal Casting (SW-15622/2022) developed at Marwadi University to Kankesh Pharmacy LLP – Viramgam (Gujarat) to Develop of Novel Wellness System for Diagnosing Specific Wellness Related Issues Using Image Processing and Pulsation

Intellectual Property Rights (IPRs)

IPRs – Commercialized

1. **Internet of Things Enabled Bottom Pouring Resistance Melting Furnace** (351953-001)
2. **Permeability Measurement Device for Investment Casting** (356835-001)
3. **IoT Enabled Temperature Monitoring Device for Melting Furnace** (349855-001)
4. **Monitoring Device for Hydraulic Wax Injection Machine** (350111-001)
5. **Monitoring Device for Wax Injection Machine** (368286-001)
6. **Quality Prognosis System (QPS) for Manufacturing** (SW-14972/2021)
7. **Foundry Data Analytics System (FDAS)** (SW-12195/2019)
8. **Android Based Process Monitoring Module for Investment Casting Foundries** (SW-14977/2021)
9. Software on **Data Management Module for Investment Casting** (SW-17234/2023)
10. Software on **Process Monitoring Module for Investment Casting** (SW-17201/2023)

IPRs – Granted/Published

1. Indian Patent on **Effective conditioning of used foundry sand for developing high strength high performance construction composites** (202321054706, published in Journal 47/2023)
2. Indian Patent on **Processing of Rice stubble for making Absorbent Sheet** (202321051159, published in Journal 47/2023)
3. Indian Patent on **Internet of Things Assisted Oxygen Concentrator for Supplying Pure Oxygen** (202321042339, published in Journal 47/2023)
4. Indian Patent on **Biodegradable and Plastic Free Absorbent Layers for Sanitary Pads and Diapers** (202321030199, published in Journal 47/2023)
5. Indian Patent on **A smart device to measure the viscosity of ceramic slurry used in Investment Casting** (202321030208, published in Journal 45/2023)
6. Indian Patent on **Device to Convert Non IIoT-based Wax Injection Press into IIoT-based Press Used in Investment Casting** (202321054702, published in Journal 39/2023)
7. Indian Patent on **Device to Transform Preheating Furnace Used in Investment Casting into IoT-based Furnace** (202321054704, published in Journal 39/2023)
8. Indian Patent on **IoT Based High Speed Slurry Mixer to Prepare Slurry Used for Shell Making in Investment Casting** (202321054705, published in Journal 39/2023)
9. Indian Patent on **A device to Measure Shell Permeability During Investment Casting Process** (202021018663, published in Journal 25/2022)
10. Indian Design on **Smart Welding Attachment** (394410 -001)
11. Indian Design on **Hand Plough** (376874-001, published in Journal 17/2023)
12. Indian Design on **Intelligent Inspection Device for Metal Casting** (351954-001, published in Journal

12/2023)

13. Indian Design on **Harvesting Invisible High Voltage from Sky** (377491-001, published in Journal 11/2023)
14. Indian Design on **Queue Length Analyzer System** (377508-001, published in Journal 09/2023)
15. Indian Design on **Internet of Things Enabled Vertical Centrifugal Casting Setup** (351952-001, published in Journal 04/2023)
16. Indian Design on **Internet of Things Enabled Bottom Pouring Resistance Melting Furnace** (351953-001, published in Journal 02/2023)
17. Indian Design on **Viscosity and pH Measurement Device for Investment Casting** (356843-001, published in Journal 02/2023)
18. Indian Design on **Front Knuckle for all Terrain Vehicle** (371078-001, published in Journal 02/2023)
19. Indian Design on **Die and Punch for Making Powder Metallurgy Tool Bit** (371075-001, Published in Journal 51/2022)
20. Indian Design on **SMART Oxygen Concentrator** (371074-001, Published in Journal 51/2022)
21. Indian Design on **Monitoring Device for Wax Injection Machine** (368286-001, Published in Journal 51/2022)
22. Indian Design on **Permeability Measurement Device for Investment Casting** (356835-001, Published in Journal 15/2022)
23. Indian Design on **Needle Penetration Device for Measuring Hardness of Wax** (363470-001, published in Journal 41/2022)
24. Indian Design on **High-Speed Slurry Mixer for Investment Casting** (355604-001, Published in Journal 08/2022)
25. Indian Design on **IoT Enabled Temperature Monitoring Device for Melting Furnace** (349855-001, Published in Journal 47/2021)
26. Software on **Weighted Criteria Approach Based Complexity Computation System for Investment Casting** (SW-17446/2023)
27. Software on **Analytical Hierarchy Process Based Complexity Computation System for Investment Casting** (SW-17250/2023)
28. Software on **Data Management Module for Investment Casting** (SW-17234/2023)
29. Software on **Process Monitoring Module for Investment Casting** (SW-17201/2023)
30. Software on **SMART Foundry** (SW-17187/2023)
31. Software on **Viscosity Measurement System for Investment Casting** (SW-17078/2023)
32. Software on **Metaverse enabled Bottom Pouring Furnace** (SW-17035/2023)
33. Software on **Metaverse Enabled Vertical Centrifugal Casting Setup** (SW-17034/2023)
34. Software on **Intelligent Inspection System for Metal Casting** (SW-15622/2022)
35. Software on **Android Based Casting Defects Categorization System for Metal Casting** (SW-14964/2021)
36. Software on **Quality Prognosis System (QPS) for Manufacturing** (SW-14972/2021)
37. Software on **Android Based Process Monitoring Module for Investment Casting Foundries** (SW-14977/2021)
38. Software on **Intelligent Melting Furnace Monitoring System (IMFMS) for Jewellery Industries** (SW-15505/2021)
39. Software on **OptiTool** (SW-10234/2019)
40. Software on **Foundry Data Analytics System (FDAS)** (SW-12195/2019)

IPRs – Filed

1. Indian Patent on **Image Processing Based Device for Investment Castings to Measure Dimension and Detect & Categorize Surface-Defects** (202321030201)
2. Indian Design on **Protector Casing for Thunderbolt to Multiple Convertor** (389673-001)
3. Indian Design on **IoT Enabled Carbon Footprint Monitoring Device** (389668-001)
4. Indian Design on **Monitoring Device for Hydraulic Wax Injection Machine** (350111-001)
5. Software on **Smart Application for Gold Purity Checking Device** (27169/2023-CO/SW)
6. Software on **Complexity Computation System for Additive Manufacturing System** (10603/2023-CO/SW)
7. Software on **Fuzzy Analytical Process Based Complexity Computation System for Investment Casting** (8375/2023-CO/SW)
8. Software on **Permeability Measurement System for Investment Casting** (19370/2022-CO/SW)

Publications

International Journal – Published/Accepted

1. Nabhan Yousef, Dr Amit Sata, **Parametric Study of Inspecting Surface Defects in Investment Casting,** *The Jordan Journal of Mechanical and Industrial Engineering*, Volume 17 (4), pp. 24- 33, 2023
2. Nabhan Yousef, Dr Amit Sata, Pinal Kantesariya **Implementing Deep Learning Based Intelligent Inspection for Investment Castings,** *International Journal of Arabian Journal for Science and Engineering*, 2023 (*accepted*)
3. Nikunj Maheta, Dr Amit Sata **Development of Novel Complexity Index (CI) for Investment Casting,** *International Journal of Metalcasting*, 2023 (*accepted*)
4. Dr Amit Sata, Mr Philip Gajera, Mr Pinal Kantesariya **Udhyog 4.0: Indian Avatar for Foundry 4.0,** *Indian Foundry Journal*, Volume 69 (8), pp. 24- 33, 2023
5. Nabhan Yousef, Dr Amit Sata, **Intelligent Inspection Device for Investment Casting**, *Indian Foundry Journal*, Volume 69 (6), pp. 20-26, 2023
6. Nabhan Yousef, Dr Amit Sata, **Intelligent Inspection for Evaluating Severity of Surface Defects in Investment Casting,** *International Journal of Advanced Manufacturing Systems*, 2023 (*accepted*)
7. Nabhan Yousef, Dr Amit Sata **Innovative Inspection Device for Investment Casting Foundries,** *International Journal of Metalcasting*, 2023 (*accepted*)
8. Nikunj Maheta, Dr Amit Sata **Systematic Development of Cumulative Complexity Index for Investment Casting,** *International Journal of Advanced Manufacturing Systems*, 2022 (*in print*)
9. Ronak Shah, Dr Mitesh Popat, Dr Amit Sata, Dr Megha Karia, **Computational Simulation for Material Selection of Femoral Component in Total Knee Replacement (TKR)**, *Journal of Harbin Engineering University*, Volume 44(5), pp. 87-92, 2023
10. Mr Jignesh Jani, Mr Siddharth Jhala, Dr Deepika Mor, Dr Amit Sata **Extending Application of Computer-Aided Manufacturing for Development of Microtia Grade III Prosthesis – A Case Study**, NanoWorld J 9(S1): S83-S87, 2023
11. Nabhan Yousef, Chandrasinh Parmar, Dr Amit Sata **Intelligent Inspection of Surface Defects in Metal Castings Using Machine Learning**, *International Journal of Materials Today: Proceedings*, Volume 67(4), pp. 517-522, 2022
12. Vishesh Dharaiya, Dr Amit Sata **Geometry Driven Criterion Function for Predicting Shrinkage Porosity in Stainless Steel Castings with T Junction**, *International* Journal of Advanced Manufacturing Systems, Volume 21(3), pp.625-638, 2022
13. Divya Bhoraniya, Vishesh Dharaiya, Amit Sata **Application of *Niyama* Criterion to Predict Shrinkage Porosity in Vertical Centrifugal Casting (VCC) of ASTM A356 Alloy**, International Journal of Process Management and Bench Marking, Volume 12(3), pp. 395-406, 2022
14. Nikunj Maheta, Dr Amit Sata **5 Cs of Investment Casting Foundries in Rajkot Cluster – An Industrial Survey,** *International Journal of Archives of Foundry Engineering,* Volume 21(3), pp. 102-108, 2021
15. Hussam Abbas, Dr Amit Sata **Quality Improvement in Investment Castings Using Genetic Algorithm**, *International Journal of Engineering Technologies*, Volume 7(3), pp. 75-82, 2021
16. Dr Amit Sata, Dr B Ravi **Foundry Data Analytics to Identify Critical Parameters Affecting Quality of Investment Castings**, *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems Part B: Mechanical Engineering,* Volume 5(1), pp. 011010-011010-7, 2018
17. Sata Amit, Ravi B, **Bayesian Inference Based Investment Casting Defects Analysis System for Industrial Application**, *International Journal of Advanced Manufacturing Technology,* Volume 90(9), pp. 3301-3315, 2017
18. Dr Amit Sata, **Investment Casting Defect Prediction Using Neural Network and Multivariate Regression along with Principal Component Analysis**, *International Journal of Manufacturing Research*, Volume 11(4), pp. 356-373, 2016
19. Dr Amit Sata, **Development of Cloud Based Casting Defects Categorization System (CDCS)**, *International Journal of Archives of Foundry Engineering,* Volume 17(1), pp. 216-222, 2016
20. Sata Amit, Sutaria M, **Scope of Investment Castings Supported by Survey of Foundries in Rajkot Cluster**. *Indian Foundry Journal*, Volume 60(6), pp. 42-46, 2014

21. Sata Amit, Ravi B, **Comparation of Some Neural Network and Multivariate Regression for Predicting**

Mechanical Properties of Investment Castings. *International Journal of Materials Engineering and Performance*, Volume 23(8), pp. 2953-2964, 2014

22. Kedar Mehta, Robin Ranjan, Amit Sata, **Investigation of Various Airfoils for Maximization of Lift in Horizontal Axis Wind Turbine (HAWT) – A case study**, *International Journal of Interdisciplinary Environmental Review,* Volume 18(2), pp. 169-188, 2017

International Journal – *Under Review*

23. Amisha Patel, Sejal Shah, Pema Wangdi, Dinesh Kumar, Amit Sata, Tripti Swarnkar, Vijaykumar Gupta, Rajesh Mahadeva, H.C.S. Perera, Shashikant Patole **Ensemble Learning Approaches in HPV Associated Oral Squamous Cell Carcinoma,** *International Journal of Intelligent Systems*, 2023 (*in review*)
24. Nikunj Maheta, Dr Amit Sata **Complexity Computation System for Industrial Investment Castings – Use Cases,** *Journal of Operational Research Society*, 2023 (*in review*)
25. Nikunj Maheta, Dr Amit Sata **Fuzzy Analytical Hierarchy Process Based Complexity Index for Investment Casting,** *Journal of Brazilian Society of Mechanical Sciences and Engineering*, 2023 (*in review*)
26. Dhaval Anadkat, Dr Amit Sata, **Implementing Metaverse Enabled Vertical Centrifugal Casting** Journal of PRESENCE: Virtual and Augmented Reality, 2023 (*in review*)
27. Matoc Dhal Abraham, Nikunj Maheta, Dr Bhavesh Kanabar, Dr Amit Sata, **Development of the Additive Manufacturing Complexity Index (AMCI)**, *Journal of Rapid Prototyping*, 2023 (*in review*)
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29. Ameen Al Njjar, Dr Amit Sata, Kamar Mazloum **Simulation of the Die and Punch Behavior During the Compaction Process of Al2O3 -Based Matrix Composite Using Finite Element Analysis**, *International Journal of Advanced Manufacturing Technology*, 2023 (*in review*)
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