



## Rayappa Shrinivas Mahale

Department of Mechanical Engineering  
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### Permanent Address

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### Fields of Research Interest

Mechatronics, Hydraulics and Pneumatics, Advanced Precision Engineering, Nano Fabrication, Design of Experiments, Material Science and Metallurgy, Micro Electromechanical Systems, Material Characterization, Powder Processing and Advanced Sintering Techniques, Mechanical Alloying, Electrochemical Sensors, and Metal Additive Manufacturing.

### Educational Degrees

Degrees	University	College	Year of Passing
Master of Technology [Production Management]	VTU, Belagavi	B V Bhoomaraddi College of Engineering & Technology, Hubli, Karnataka.	2014
Bachelor of Engineering [Industrial & Production Engineering]	VTU, Belagavi	Bapuji Institute of Engineering & Technology (BIET), Davanagere, Karnataka.	2011
PhD (Pursuing) [Advanced Materials]	REVA University Bangalore	REVA University, Bangalore, Karnataka.	----

**Present Position**

Assistant Professor Jain College of Engineering and Research, Belagavi, Karnataka (June 2022 to Present).

**Professional Experience**

Lecturer Department of Mechatronics, JSS KHK Institute of Engineering, Dharwad, Karnataka (Aug 2011-April 2012).

Project Trainee, Tata Hitachi Construction Machinery Company Limited, Dharwad, Karnataka (Feb 2014-July 2014).

Assistant Professor Department of Mechanical Engineering, D Y Patil Technical Campus, Pune, Maharashtra (July 2014-December 2019).

Visiting Faculty Department of Mechanical Engineering, Vishwakarma Institute of Information Technology, Pune, Maharashtra (Aug 2020-May 2022).

**Experience in Research**

Research in REVA University Bangalore: Research Scholar in School of Mechanical Engineering from December 2019 to present.

**Reviewer of Journals**

1. Progress in Additive Manufacturing (Springer).
2. 3D Printing and Additive Manufacturing.
3. Metals and Materials International (Springer).
4. Iranian Journal of Chemistry and Chemical Engineering.
5. IGI Global.
6. Physical Chemistry Research.

**List of Publications**

**Rayappa Shrinivas Mahale**, Gaitonde V N, Implementing the concept of Paint Before Assembly (PBA) to the typical assembly line. International Journal of Innovative Research in Advanced Engineering (IJIRAE) Volume 1, Issue 9 (October 2014). ISSN: 2349-2163.

Suryawanshi Ravishankar, **Rayappa Shrinivas Mahale**, A Study on Magneto Rheological Fluids and Their Applications. International Research Journal of Engineering and Technology (IRJET) Volume 2, Issue 4 (July 2015). E-ISSN: 2395-0056 p-ISSN: 2395-0072.

Pritam Kamble, **Rayappa Shrinivas Mahale**, Simulation, and parametric study of Clinched Joint. International Research Journal of Engineering and Technology (IRJET) Volume 3, Issue 5 (May 2016). E-ISSN: 2395-0056 p- ISSN: 2395-0072.

Vishal Choudhari, Vaibhav Bodkhe, Shubham Deokate, Bhupendra Mali, **Rayappa Shrinivas Mahale**, Parametric Optimization of TIG Welding on SS-304 and MS Using Taguchi Approach. International Research Journal of Engineering and Technology (IRJET) Volume 6, Issue 5 (Apr 2019). E-ISSN: 2395-0056 p-ISSN: 2395-0072.

Rohith Yadav, Shubham More, Onkar Mutekar, Aditya Mogal, **Rayappa Shrinivas Mahale**, Multilevel Object Sorting System using PLC Controller. International Research Journal of Engineering and Technology (IRJET) Volume 6, Issue 5(May 2019). E-ISSN: 2395-0056 p-ISSN: 2395-0072.

**Rayappa Shrinivas Mahale**, Shamanth V, Sharath P.C. (2021). Review on Processing and Characterization of Duplex Stainless Steels. In: Narasimham, G.S.V.L., Babu, A.V., Reddy, S.S., Dhanasekaran, R. (eds) Recent Trends in Mechanical Engineering . Lecture Notes in Mechanical Engineering. Springer, Singapore. [https://doi.org/10.1007/978-981-15-7557-0\\_20](https://doi.org/10.1007/978-981-15-7557-0_20).

**Rayappa Shrinivas Mahale**, V. Shamanth, P.C. Sharath, R. Shashanka, K. Hemanth, A review on spark plasma sintering of duplex stainless steels, Materials Today: Proceedings, Volume 45, Part 1, 2021, Pages 138-144, ISSN 2214-7853, <https://doi.org/10.1016/j.matpr.2020.10.357>.

**Rayappa Shrinivas Mahale**, V Shamanth, P. C. Sharath, K Hemanth, Nithin S K, Adarsh Patil, R Shashanka, Technology and Challenges in Additive Manufacturing of Duplex Stainless Steels, Biointerface Research in Applied Chemistry, Volume 12, Issue 1, 2022, 1110 – 1119, <https://doi.org/10.33263/BRIAC121.11101119>.

Adarsh Patil, N R Banapurmath, A M Hunashyal, Vinod Kumar V Meti, **Rayappa Shrinivas Mahale**, Development and Performance analysis of Novel Cast AA7076-Graphene Amine-Carbon Fiber Hybrid Nanocomposites for Structural Applications, Biointerface Research in Applied Chemistry, Volume 12, Issue 2, 2022, 1480 – 1489, <https://doi.org/10.33263/BRIAC122.14801489>.

**Rayappa Shrinivas Mahale**, V Shamanth, K Hemanth, P. C. Sharath, R Shashanka, Adarsh Patil, B S Rathod, Sensor Based Additive Manufacturing Technologies, Biointerface Research in Applied Chemistry, Volume 12, Issue 3, 2022, 3513 – 3521, <https://doi.org/10.33263/BRIAC123.35133521>.

**Rayappa Shrinivas Mahale**, V. Shamanth, K. Hemanth, S.K. Nithin, P.C. Sharath, R. Shashanka, Adarsh Patil, Darshan Shetty, Processes, and applications of metal additive manufacturing, Materials Today: Proceedings, 2021, ISSN 2214-7853, <https://doi.org/10.1016/j.matpr.2021.08.298>.

S.K. Nithin, K. Hemanth, V. Shamanth, **Rayappa Shrinivas Mahale**, P.C. Sharath, Adarsh Patil, Importance of condition monitoring in mechanical domain, Materials Today: Proceedings, 2021, ISSN 2214-7853, <https://doi.org/10.1016/j.matpr.2021.08.299>.

**Rayappa Shrinivas Mahale**, R Shashanka, Shamanth Vasanth, R Vinaykumar, Voltammetric Determination of Various Food Azo Dyes Using Different Modified Carbon Paste Electrodes, Biointerface Research in Applied Chemistry, Volume 12, Issue 4, 2022, 4557-4566, <https://doi.org/10.33263/BRIAC124.45574566>.

Sharath P C, Gurudath B, Sharath B N, Karthik S, **Rayappa Shrinivas Mahale**, Mechanical and Tribological Characteristics of Aluminium 2618 Matrix Composite Reinforced with Boron Carbide, Biointerface Research in Applied Chemistry, Volume 12, Issue 4, 2022, 4544-4556, <https://doi.org/10.33263/BRIAC124.45444556>.

**Rayappa Shrinivas Mahale**, Shamanth V, Hemanth K, Sharath P C and R Shashanka, Mechanical Testing of Spark Plasma Sintered Materials: A Review, AIP Conf. Proc. 2469, 020026-1–020026-24; <https://doi.org/10.1063/5.0080183>.

Nithin S K, Hemanth K, Shamanth V, **Rayappa Shrinivas Mahale** and Adarsh Patil, Design, and impact study of a composite material front bumper for an automobile, AIP Conference Proceedings 2469, 020027 (2022), <https://doi.org/10.1063/5.0080202>.

Nithin S K, Hemanth K, Shamanth V and **Rayappa Shrinivas Mahale**, Design, and analysis of knuckle joint assembly under tensile loading condition, AIP Conference Proceedings 2469, 020016 (2022), <https://doi.org/10.1063/5.0080200>.

Athena Ehsani, **Rayappa Shrinivas Mahale**, Shika Shayegan, Ali Attaeyan, Atefeh Ghorbani, Shamanth Vasanth, Sharath P C, Sheyda Shahriari, Azadeh Asefnejad, A review of the treatment of bone tumours by hyperthermia using magnetic nanoparticles. Journal of Nanoanalysis, 2022, doi: 10.22034/jna.2022.1944876.1278.

**Rayappa Shrinivas Mahale**, Shamanth Vasanth, Hemanth Krishna, Shashanka R, Sharath P C, Sreekanth N V. Electrochemical Sensor Applications of Nanoparticle Modified Carbon Paste Electrodes to Detect Various Neurotransmitters: A Review. AMM 2022; 908:69–88. <https://doi.org/10.4028/p-mizm85>.

Vinayak Adimule, Shashanka Rajendrachari, **Rayappa Shrinivas Mahale**, Sheetal Batakurki, Basappa C Yallur, Santosh Nandi and Gangadhar Bagihalli, Dielectric and Mechanical Properties of Silicone Rubber Composites Reinforced by Conductive Carbon Black and Neopentyl Glycol Diglycidyl Ether. Silicon (2022). <https://doi.org/10.1007/s12633-022-02210-8>.

R Shashanka, Somashekharappa K. K, **Rayappa Shrinivas Mahale**, Shamanth Vasanth and Sharath P C (2022). A Review on Cyclic Voltammetric Investigation of Toxic Heavy Metals, Frontiers in Voltammetry. IntechOpen. <https://doi.org/10.5772/intechopen.108411>.

**Rayappa Shrinivas Mahale**, Kanaginahal, G. M, Shamanth Vasanth, Tiwary V. K, Shashanka R, P. C. Sharath, & Patil Adarsh (2023). Applications of Fused Deposition Modeling in Dentistry. In R. Keshavamurthy, V. Tambrallimath, & J. Davim (Eds.), Development, Properties, and Industrial Applications of 3D Printed Polymer Composites (pp. 211-219). IGI Global. <https://doi.org/10.4018/978-1-6684-6009-2.ch012>.

Gangadhar M Kanaginahal, **Rayappa Shrinivas Mahale**, Shamanth Vasanth, P C Sharath and R Shashanka (2023). Studies on Dielectric, Super-Capacitive and Photoluminescence Properties of Metal Organic Frameworks Subjected to Varying Temperature and Frequencies. Nano Hybrids and Composites, Volume 39, <https://doi.org/10.4028/p-si6964>.

Kanaginahal G.M, Tambrallimath V. Murthy M, **Rayappa Shrinivas Mahale**, Adarsh Patil, Suyash Y Pawar and Prashant P Kakkamari (2023). Flammability Studies of Natural Fiber-Reinforced Polymer Composites fabricated by Additive Manufacturing Technology: A Review. *J. Inst. Eng. India Ser. D* (2023). <https://doi.org/10.1007/s40033-023-00509-3>.

P.C. Sharath, **Rayappa Shrinivas Mahale**, Shamanth Vasanth, Hemanth Krishna, R. Shashanka, S.N. Vasantha Kumar, Babarao Sitaram Rathod, 21-Biological and biomedical applications of fluoropolymer nanocomposites, Woodhead Publishing Series in Composites Science and Engineering, Advanced Fluoropolymer Nanocomposites, Woodhead Publishing, 2023, Pages 755-785, <https://doi.org/10.1016/B978-0-323-95335-1.00001-3>.

**Mahale, Rayappa Shrinivas**, Shamanth Vasanth, Sharath Peramenahalli Chikkegouda, Shashanka Rajendrachari, Damanapeta Narsimhachary, and Nagaraj Basavegowda. 2023. "Electrochemical Determination of Ascorbic Acid by Mechanically Alloyed Super Duplex Stainless Steel Powders" *Metals* 13, no. 8: 1430. <https://doi.org/10.3390/met13081430>.

## **Published Patent**

### **Title of the invention:**

Process and Composition for synthesizing Silicone Rubber Polymer Composites reinforced by Carbon-Black and Neopentyl Glycol-Diglycidyl Ether.

**Abstract:** The present invention generally relates to a process for synthesizing silicone rubber polymer composites reinforced by conductive carbon black and neopentyl glycol diglycidyl Ether comprises mixing 3-10 millilitre silicon rubber (SR), 8-12 millilitre carbon black (CB), and 10-15 millilitre neopentyl glycol diglycidyl ether (NPGDE) uniformly in a 100 ml round bottom flask; adding 40ml ethanol (EtOH) along with 2-3 drops of acetic acid; refluxing the solution at 70-80°C for 6-8 h and evaporating the solution to dryness to obtain semi-solid material; and cooling the semi-solid material at room temperature followed by isolation and keeping for constant drying in the oven at 40° C for about 10-15 hour.

Application No: 202022105325

Publication Date: 21/09/2022.

## **Lectures Delivered**

Guest talk on "Basics of Additive Manufacturing", JAIN Deemed to be University, Bangalore, April 2021.

Guest talk on "Essentials of Nanotechnology in Mechanical Engineering", Vishwakarma Institute of Information Technology, Pune, April 2022.

Guest talk on "Advancement in Powder Metallurgy and Particulate Materials", Institution of Engineers India, Belagavi local chapter, Belagavi, February 2023.

## **Details of participation in Conferences/Seminars/Faculty Development Programs/Workshops**

Attended a workshop on "Advances in Composites and Nano Materials" conducted from 10<sup>th</sup> to 12<sup>th</sup> April 2014 at BVBCET Hubli.

Participated in National level technical paper presentation event held in Sinhgad Institute of Technology Lonavala during January 2015 (Topic: Reduction of Quality defects in a typical assembly line by the application of CPI methodologies).

Attended two days lecture series "To Celebrate the International year of Crystallography (IICr – 2014)- looking to the future, learning from the past" conducted on 13<sup>th</sup> and 14<sup>th</sup> March 2015 at BVBCET Hubli.

Attended a workshop on "MEMS (Design, Modeling and Simulation)" conducted on 24<sup>th</sup> and 25<sup>th</sup> April 2015 at D. Y. Patil School of Engineering Academy, Pune.

Participated in National workshop on "Advances in Composite Materials and DOE" conducted from 29 to 31<sup>st</sup> July 2015 at KLS Gogte Institute of Technology, Belgaum.

Attended two days faculty development program on "Sa Vidya Ya Vimuktaye" Education is that which liberates an individual conducted from 22<sup>nd</sup> to 23<sup>rd</sup> August 2015 at D. Y. Patil Technical Campus, Pune. Participated in National workshop on "ANSYS Mechanical Linear and Non-Linear Dynamics" conducted from 07<sup>th</sup> to 08<sup>th</sup> January 2016 at D. Y. Patil School of Engineering Academy, Pune.

Attended a workshop on “Syllabus Detailing of TE Mechanical, 2015 Course for the subject Metrology and Quality Control (MQC)” on 21<sup>st</sup> October 2016 organized by Board of Studies, Mechanical Engineering, Savitribai Phule Pune University (SPPU) In Association with Mechanical Engineering Department of Shri Ramachandra College of Engineering, Pune.

Attended a workshop on “Recent Trends in Mechatronics” conducted from 13<sup>th</sup> to 14<sup>th</sup> December 2016 at Pimpri Chinchwad College of Engineering and research (PCCOE&R), Pune.

Attended two days state level workshop on “Project Based Learning with Simulink” from 7<sup>th</sup> to 8<sup>th</sup> February 2017 at D Y Patil Technical Campus, Pune.

Participated in National workshop on “New Trends in Mechanical Engineering (NCNTME-2017)” conducted from 18<sup>th</sup> to 19<sup>th</sup> February 2017 at D Y Patil Technical Campus, Pune.

Attended one day faculty development program on “Preparing for Presentation and improving Communication Skills” conducted on 6<sup>th</sup> April 2017 jointly organized by ICFAI Business School, Computer Society of India (CSI) Pune, and D Y Patil School of Engineering Academy, Pune.

Attended a workshop on “Syllabus Implementation of TE Mechanical, 2015 Course for the subject Mechatronics” on 12<sup>th</sup> January 2018 organized by Board of Studies, Mechanical Engineering, Savitribai Phule Pune University (SPPU) In Association with Mechanical Engineering Department of Pimpri Chinchwad College of Engineering, Pune.

Attended a workshop on “Syllabus Detailing of BE Mechanical, 2015 Course for the subject Hydraulics and Pneumatics” on 22<sup>nd</sup> February 2018 organized by Board of Studies, Mechanical Engineering, Savitribai Phule Pune University (SPPU) In Association with Mechanical Engineering Department of AISSMS College of Engineering, Shivaji Nagar, Pune.

Attended a workshop on “Syllabus Implementation of BE Mechanical, 2015 Course for the subject Hydraulics and Pneumatics” on 13<sup>th</sup> July 2018 organized by Board of Studies, Mechanical Engineering, Savitribai Phule Pune University (SPPU) In Association with Mechanical Engineering Department of Vishwakarma Institute of Information Technology, Pune.

Attended a two day state level seminar on “Research Methodology” organized by D Y Patil Institute of Management, Pune from 5<sup>th</sup> to 6<sup>th</sup> February 2019.

Participated and presented paper in 3<sup>rd</sup> International Conference on Innovations in Mechanical Engineering (ICIME – 2020) held at Guru Nanak Institutions, Hyderabad on 10<sup>th</sup> to 11<sup>th</sup> January 2020. (Topic: Processing and characterization of duplex stainless steels).

Participated and presented paper in Technospark - 2020 – A State Level Online Competition on 29 to 30<sup>th</sup> May 2020 organized by Pimpri Chinchwad College of Engineering and Research, Pune.

Participated and presented paper in National Level E-Conference on Innovative Trends in Mechanical Engineering (NECITME – 2020) on 6<sup>th</sup> to 7<sup>th</sup> July 2020 organized by Sinhgad Institute of Technology, Lonavala. (Topic: A Study on Precipitation Kinetics of Super DSS).

Participated and presented paper in 4<sup>th</sup> International Conference on Advanced Research in Mechanical, Materials and Manufacturing Engineering on 10<sup>th</sup> to 11<sup>th</sup> July 2020 organized by REVA University, Bangalore. (Topic: A Review on Spark Plasma Sintering of Duplex Stainless Steels).

Participated and presented paper in National online conference on Research and Developments in Material Processing, Modelling and Characterization 2020 on 26<sup>th</sup> to 27<sup>th</sup> August 2020 organized by National Institute of Technology Jamshedpur. (Topic: A Review on Metal Additive Manufacturing Processes).

Participated and completed AICTE Training and Learning (ATAL) Academy Online Faculty Development Program on "3D Printing & Design" from 08-02-2021 to 12-02-2021 at Canara Engineering College, Mangalore, Karnataka.

Participated and completed AICTE Training and Learning (ATAL) Academy Online Faculty Development Program on "Robotics Process Automation" from 17.05.2021 to 21.05.2021 at National Institute of Electronics and Information Technology, Gorakhpur, Uttar Pradesh, India.

Participated and presented paper in 5<sup>th</sup> International Conference on Advanced Research in Mechanical, Materials and Manufacturing Engineering (ICAMMME-2021) on 09<sup>th</sup> to 10<sup>th</sup> July 2021 organized by REVA University, Bangalore. (Topic: Processes and Applications of Metal Additive Manufacturing).

Participated and presented paper in National Conference on Recent Developments in Mechanical Engineering (RDME-2021) on 18<sup>th</sup> August 2021 organized by Modern Education Societies College of Engineering, Pune. (Topic: Mechanical Testing of Spark Plasma Sintered Materials: A Review).

Attended the AICTE sponsored online short-term training programme on "Additive Manufacturing of Multifunctional Nanocomposites" conducted from 23<sup>rd</sup> August 2021 to 27<sup>th</sup> August 2021 organized by Institute of Road and Transport Technology (IRTT) Erode, Tamilnadu.

Attended the online faculty development programme on "Innovations in Additive Manufacturing" conducted from 13<sup>th</sup> September 2021 to 17<sup>th</sup> September 2021 organized by Department of Mechanical Engineering, Bharati Vidyapeeth's College of Engineering, Pune.

Attended the one week international faculty development program on "Trends and Challenges in the Development of Electric Vehicles and Hybrid Electric Vehicles (Series-I) held from 26<sup>th</sup> to 30<sup>th</sup> October 2022 organized by the Department of Mechanical Engineering Lendi Institute of Engineering and Technology, Andhra Pradesh.

Attended two day workshop on "Intellectual Property Rights" held from 4<sup>th</sup> to 5<sup>th</sup> November 2022 organized by Jain College of Engineering, Belagavi in association with Karnataka State Council for Science and Technology.

Attended the one week international faculty development program on "Trends and Challenges in the Development of Electric Vehicles and Hybrid Electric Vehicles" (Series-II) held from 14<sup>th</sup> to 18<sup>th</sup> November 2022 organized by the Department of Mechanical Engineering Lendi Institute of Engineering and Technology, Andhra Pradesh.

Attended two days all India seminar on "Sustainable Development of Industries through Industry 4.0 Application" organized by the institution of engineers Belagavi local center in association with Belgaum foundry cluster and the institute of Indian foundrymen Belgaum chapter from 3<sup>rd</sup> to 4<sup>th</sup> December 2022.

Participated and presented paper in International Conference on Powder Metallurgy and Particulate Materials + Exhibition (PM-23) conducted during the period of 13<sup>th</sup> to 15<sup>th</sup> March 2023 at Hotel The Lalit Mumbai. (Topic: Impact of Sintering on Metal Organic Frameworks: A Review).

Coordinated and attended the one week faculty development program in association with Visvesvaraya Technological University, Belagavi on "Research Methodology and Effective Teaching Skills" held from 15<sup>th</sup> to 20<sup>th</sup> May 2023 organized by Jain College of Engineering and Research, Udyambag, Belagavi.

Participated and presented paper in Third Global Conference on Recent Advances in Sustainable Materials (GC-RASM 2023) conducted during the period of 27<sup>th</sup> to 28<sup>th</sup> July 2023 at PGP College of Engineering & Technology, Tamil Nadu, India. (Topic: Direct Metal Deposition: A Promising Approach in 3D Metal Printing).

Participated and presented paper in 7<sup>th</sup> International Conference on Sustainable Materials and Recent Trends in Mechanical Engineering (SMARTME-2023) conducted during the period of 11<sup>th</sup> to 12<sup>th</sup> August 2023 at REVA University, Bengaluru. (Topic: From Powders to Alloys: A Study of the Mechanical Alloying Process and Sintering).

Attended the one week national level faculty development program on “Recent Advances and Challenges in Electric Vehicles” held from 21<sup>st</sup> to 25<sup>th</sup> August 2023 organized by the Department of Mechanical Engineering, K J College of Engineering and Management Research, Pune.

### **Industry Projects**

Remedial Measures for Casting Defects using the Taguchi Orthogonal Array Approach, Glow Cast Belagavi.

Enhancing Green Sand and Pouring Process Parameters to improve Casting Quality, Glow Cast Belagavi.

### **Achievements**

For attaining the top result in Mechatronics and Engineering Metallurgy disciplines in the academic year 2015-2016, received the best teacher award from D Y Patil School of Engineering Academy Pune.

For attaining the top result in Metrology and Quality Control discipline in the academic year 2017-2018, received the best teacher award from D Y Patil School of Engineering Academy Pune.

Certificate of appreciation from Jain College of Engineering and Research Belagavi on Jan 2023 for publishing patent entitled “Process and Composition for synthesizing Silicone Rubber Polymer Composites reinforced by Carbon-Black and Neopentyl Glycol-Diglycidyl Ether”.

