CURRICULUM VITAE

Gaurav D. Sonawane, Ph. D*, M. Tech, B.E, D. Tech

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CAREER OBJECTIVE

To reach the highest order research level in Materials and Manufacturing Engineering through hard work, dedication and continuously updating my work areas by assimilating the latest trends and applying my knowledge as well as abilities with a positive attitude.

AREA OF INTEREST

- Metallurgy
- Heat Treatments and NDT
- Tooling, Dry Machining (Hard Coating Materials)
- Measurement Science and Quality Control

QUALIFICATIONS

Sr. No.	Qualification	Year of passing	University	Marks/ CGPA	Class
1	Ph D in Mechanical (Manufacturing)	2021	Dr. BATU, Lonere, Raigad	**Awarded**	
2	M-Tech in Mechanical (Manufacturing)	2010	Dr. BATU, Lonere, Raigad	8.6 (79%)	**Distinction**
3	B. E. (Mechanical)	2007	N.M. U	70.07%	**Distinction**
4	Diploma (Mechanical)	2003	M.S.B.T.E.	67.00%	**Ist Class**
5	S.S.C	1998	Nasik Board	72.00%	**Ist Class**

EXPERIENCE (12 YEARS)

- Research Scholar at Dr. Babasaheb Ambedkar Technological University, Lonere, Raigad from July 2014 to July 2020.
- Currently, working with Sandip Foundation's SITRC, as Assistant Professor.

ACHIEVEMENTS

- Invited as a **Session Chair** at **International Conference on Industrial, Mechanical and Manufacturing Science (ICIMMS Berlin, Germany, 2019).**

- **Best Paper Award at International Conference on Industrial, Mechanical and Manufacturing Science (ICIMMS 2019) on "Studies on Characterization and Machinability of Duplex Stainless** Steel **2205 during Dry Turning"** at Berlin, Germany, on 21st -22th May 2019
- **University Topper** of Dr. B.A.T. University Raigad for M. Tech. course in 2010 **scored CGPA 8.6 on a 10 Scale (79%).**

MEMBERSHIP

- Life Member of **Indian Society of Technical Education (ISTE)**, Member ID- LM 9920
- Life Member of The **Indian Institute of Metals (IIM)**, Member ID- 51750

RESEARCH PROJECTS

- **Ph D Project: Machinability Studies of Duplex Stainless Steel 2205 during Turning.**

A Research work carried out on dry turning of DSS2205 using coated tools supported by CemeCon, Germany and Balzer, India. It is a study of the effect of Physical Vapor Deposition (PVD) coatings deposited by advanced deposition techniques including HiPIMS and S3p on Tool Wear, Tool Life, Cutting Force, Cutting Temperature and Surface Roughness during Duplex Stainless Steel (DSS) 2205 dry turning. The research work is carried out with 2 stages. First stage includes metallographic study of tool materials and coatings used and in later part the machining performance was tested to corelate with the properties of tool and coating material.

Results: Tungsten Carbide inserts coated with advanced PVD HiPIMS and S3p technique was deposited with AlTiN and AlTiCrN coatings. The dry machining was conducted so as to compare uncoated and coated tools. An improvement in tool life for coated tools of 7-times higher than uncoated tools was achieved with least roughness of machined surface and cutting force. These results will surely be a database for selection of tool and coating materials for machining DSS in dry conditions with economical benefits.

This work has been published in **Two** International Conferences (IIT, Madras and Berlin Germany) and **Two** SCI (Springer) Journals.

- **M. Tech project: Comparative Performance Evaluation of Uncoated and Coated Carbide Inserts in Dry End Milling of Stainless Steel (SS 316L).**

A Research work carried out on SS316L during end milling. Carbide inserts for an end mill cutter were used to machine SS316L material. Tool life criterion was used to measure tool wear. Coated tools using AlCrN coating w.r.t. uncoated inserts were compared for tool life.

Results: Indexable inserts with different cutting conditions were used for end milling cutter so as to evaluate Tool life as well as Surface Finish. Graphs of comparison using Origin 6.0 indicated coated tools gives far better tool life as well as surface finish. One can have easy prediction for selection of tool materials at a certain cutting condition of high-speed machining of SS316L. This work has been published in One International Conference and One International Journal.

EXPERTISE AND AREAS OF INTEREST

While working in the academic field, I have developed and handled two research labs including **Metallurgy and Material Testing lab** and **Metrology and Quality Control Lab.** Using these two labs, I have flourished practical expertise in some of the fields as follows:

- **Heat Treatments**

In **Metallurgy and Material Testing lab,** I have worked on Heat treatments like Hardening, Annealing, Induction and Flame Hardening. Some research work is also published related to heat treatments as follows:

1) Analysis of different heat-treated materials for fatigue failure
https://aip.scitation.org/doi/abs/10.1063/1.5058257

2) Review on Recent Trends Optimization in Heat Treatment
https://www.researchgate.net/profile/Shrikant_surikanta_Gunjal_gunzaru/publication/280722682_Review_on_Recent_Trends_Optimisation_in_Heat_Treatment/links/55c2f4b708aeb975673e4e93/Review-on-Recent-Trends-Optimisation-in-Heat-Treatment.pdf

- **Metallurgy, Material Testing and Analysis**

In Metallurgy lab, various analysis related to microstructure, grain size determination and unwanted inclusions are studied. Moreover, the testing of raw metals is carried out using both destructive and non-destructive tests.
Destructive testing: Hardness, Hardenability, Toughness, Wear resistance, Fatigue Strength
Non-Destructive Testing: Crack detection using Fluorescent DPT, Ultrasonic Testing, Magnetic particle testing

This expertise is quite essential in selecting and testing a raw material for any application. My expertise in analysis related to tools and materials is published at International level by high quality journals as quoted in SCI publications sections.

- **Measurement and Quality control**

In MQC lab I have developed practical expertise related to measurement of different dimensions using measurement instruments. I can use instruments like Profile projector, Sine bar, Optical flat for measuring and maintaining dimensional accuracy of finished goods. I am also aware of the different tools used for quality control in shop floor of an industry like 5s, Zero defect, Quality circle, etc.

- **Notable guided projects:**

1. Analysis of different heat-treated materials for fatigue failure (work published)
2. Hydro-pneumatic braking system (Patent published).
3. Double disc Cutting, Grinding and Polishing machine for specimen preparation for microscopic study of metals (Patent published).
4. Electric Garbage Emptier Vehicle (Sponsorship of Rs. 3.5 L).
5. Abrasive Jet Machining Test Rig.
6. Fatigue Testing Machine (Sponsorship Rs. 25000).
7. Retro Fitment of Electric Powertrain in Tata Nano (Sponsorship Rs. 1.5L).

GRANTS RECEIVED FOR RESEARCH PROJECTS:

1. The project 'Dry Turning of DSS2205 using Carbide Tools' sponsored by Department of Science and Technology, Government of India. Fund: Rs. 1,00,000/-.
2. Young scientist/teacher travel grant (Berlin, Germany) from Board of College and University Development, Savitribai Phule Pune University, Pune. Amount Rs. 52,000/-.
3. Financial assistance grant from Sandip Institute of Technology and Research Centre, Nashik. Amount Rs. 22,500/-.

PUBLICATIONS

I. Patents (03)

- IND Patent 2098/MUM/2014 A: **"Hydro-pneumatic Braking System"**, January 01, 2016
- IND Patent 3430/MUM/2014 A: **"Fabrication of Double Disc Polishing, Grinding and Cutting Machine"**, May 05, 2016.
- IND Patent 2016210002617 A: **"Advanced Drilling Machine"**, July 28, 2017.

II. SCI Publications (02)

- Paper published in 'Journal of the Brazilian Society of Mechanical Sciences and Engineering **(Springer 1.74)',** on **"Evaluation and Multi-objective Optimization of Nose Wear, Surface Roughness and Cutting Forces using Grey Relation Analysis (GRA)".**
- Paper published in 'International Journal of Precision Engineering and Manufacturing **(Springer 1.90)**', on **"Machinability Study of Duplex Stainless Steel 2205 during Dry Turning"**.

III. International Journals (04)

- Published a paper in an international journal 'AIP Conference Proceedings' **(Scopus)** on **"Analysis of Heat Treated Materials for Fatigue Failure" in October 2018.**
- Published a paper in an international journal of computer application (Impact Factor 2.58) on **"Review on Intensive Quench- a boon to Heat Treatment Technology" in July 2014.**
- Published a paper in an International Organisation of Scientific Research, Journal of Mechanical and Civil Engineering (IOSR-JMCE 1.47) on **"Review on Recent Trends & Optimization in Heat Treatment" in June 2014.**
- Published a paper in an international journal of computer application (Impact Factor 0.8) on **"Comparative Performance Evaluation of Uncoated and Coated Carbide Inserts in Dry End Milling of Stainless Steel (SS316L)" in March 2012.**

IV. International Conference (03):

- Presented a paper in an international conference **International Conference on Industrial, Mechanical and Manufacturing Science (ICIMMS 2019) on "Studies on Characterization and Machinability of Duplex Stainless Steel 2205 during Dry Turning"** at **Berlin, Germany,** on 21-22 May 2019
- Presented a paper in an international conference **PRECISION, MESO, MICRO AND NANO ENGINEERING (COPEN-10) "Machinability studies of Duplex Stainless Steel 2205 using coated tools"** at **IIT, Madras**, on 08-09 November 2017.
- Presented a paper in an international conference **ICCIA 2010** on **"Experimental Investigation on Surface Roughness of High-Speed Machined AL-SI ALLOY"** at Sandip Foundation's **SITRC, Nasik** on 03-05 March 2010.

WORK-SHOPS

- Attended a 5-day Faculty Development Program (FDP) on **"Recent Trends in Mechanical Engineering"** at Maratha Mandals College of Engineering, Pune from 10th to 14th December 2018
- Attended ISTE approved one-week Short Term Training Programme on, **"Recent Trends in Material Science and Energy Engineering"** at Kokan Gynpeeth COE, Karjat, Mumbai on 14-18 Nov 2011

- Attended 2-day work shop on **"Aeronautical Technology used in Aircraft" sponsored by University of Pune and HAL Nasik** at Hindustan Aeronautical Ltd. (HAL) Nasik on 4 and 5 March 2011.

SKILLS IN BRIEF

- Creative researcher and analyzer
- Flexible and Computer Savvy
- Liaising with suppliers, customers and R & D staff
- Trainer and mentor
- Planning and organizing maintenance
- Supervising technical and non-technical staff
- Networking
- Diagnosing faults and investigate production problems
- Handle any underlying mechanical problem

Research Guide: (M. Tech and Ph. D.)

Prof. (Dr.) Vikas G. Sargade
Professor, Mechanical Engineering Deptt.
Dr. B. A. T. University, Lonere.
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