Sandeep Kumar

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EDUCATION

Indian Institute of Technology, Roorkee, India
Ph.D. in Mechanical Engineering — Dec 2014 – Dec 2019
Thesis Advisor: Prof. Akshay Dvivedi

Indian Institute of Technology, Roorkee, India
M.Tech. in Mechanical Engineering (with 8.091/10 CGPA) — Jul 2011 – June 2013
Thesis Advisor: Prof. Akshay Dvivedi, & Prof. Pradeep Kumar

G. B. Pant University of Agriculture & Technology, Pantnagar, Uttarakhand, India
B.Tech. in Production Engineering (with 6.685/10 CGPA) — Jul 2006 – Jun 2010

Board of High School and Intermediate Education Uttarakhand, Nainital, India
Intermediate Examination (with 53.80%) — Jul 2003 – Jun 2004

Board of High School and Intermediate Education Uttarakhand, Nainital, India
High School Examination (with 62.50%) — Jul 2001 – Jun 2002

RESEARCH INTERESTS

- Ultrasonic Machining Process
- Impact Machining Processes
- Advanced Machining Processes and Hybrid Machining Processes
- Investment Casting Process

PROJECTS

Ph.D. Thesis: Performance Analysis of Rotary Tool Micro-USM Process

- Design and development of rotary tool micro-ultrasonic machining facility.
- Fabrication of microfeatures such as microholes and microchannels on difficult-to-machine hard and brittle materials.
- Development of mathematical models of material removal rate and tool wear for rotary tool micro-ultrasonic machining process.
- Development of microfluidic devices using the developed setup of rotary tool micro-ultrasonic machining process.

M. Tech Thesis: Parametric Optimization and Investigation of Ultrasonic Turning Process

- Development of experimental facility for ultrasonic turning process.

- Feasibility study of ultrasonic turning process.
- Parametric investigation and optimization of ultrasonic turning process.

B. Tech Project: Study of ERP – An Idea to Develop a Customized Software as an Alternative

- Design and development of customized software for materials management considering inventory model, in Microsoft Visual Basic as front end and MS– Access as back end.

PUBLICATIONS

International Journals (Published)

1. **S. Kumar,** A. Dvivedi, S. Rakurty, T. Tiwari and M. Tewari (2024) "Analytical model for material removal rate in rotary tool micro-ultrasonic machining of hard and brittle materials", Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering, 09544089231159209**.** (**SCI, Impact Factor: 2.4**)
2. **S. Kumar,** A. Dvivedi, T. Tiwari and M. Tewari (2023) "Predictive modeling of tool wear in rotary tool micro-ultrasonic machining", Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering, 09544089231159209**.** (**SCI, Impact Factor: 2.4**)
3. N. K. Jha, **S. Kumar,** R. K. Arya, A. Dvivedi and S. Rajesha (2022) "Performance evaluation and multi-response hybrid optimization of grinding assisted rotary disk ECDM during cutting of Al-6063 SiCp MMC", Indian Journal of Engineering and Materials Sciences, Vol. 29 (4), pp. 445-458**.** (**SCI, Impact Factor: 0.9**)
4. **S. Kumar** and A. Dvivedi (2020) "Development of material removal rate and performance evaluation of ultrasonic turning process", Materials and Manufacturing Processes. Vol. 35(14), pp. 1598-1611. (**SCI, Impact Factor: 4.8**)
5. **S. Kumar** and A. Dvivedi (2019) "On Machining of Hard and Brittle Materials using Rotary Tool Micro-ultrasonic Drilling Process", Materials and Manufacturing Processes. Vol. 34(7), pp.736-748. **(SCI, Impact Factor = 4.8)**
6. **S. Kumar** and A. Dvivedi (2019) "Micro-ultrasonic drilling of monocrystalline silicon: An experimental investigation on machined surface topography and optimization using user's preference rating based TOPSIS", Material Science in Semiconductor Processing. Vol. 102, pp. 1-16. **(SCI, Impact Factor = 4.1)**
7. **S. Kumar** and A. Dvivedi (2019) "On effect of tool rotation on performance of rotary tool micro-ultrasonic machining", Materials and Manufacturing Processes, Vol. 34(5), pp. 475-486. **(SCI, Impact Factor. = 4.8)**
8. **S. Kumar** and A. Dvivedi (2019) "Effect of tool materials on performance of rotary tool micro‑USM process during fabrication of microchannels", Journal of Brazilian Society of Mechanical Engineering, Vol. 41:432. (**SCI, Impact Factor: 2.2**)
9. **S. Kumar** and A. Dvivedi (2018) "Fabrication of microchannels using rotary tool micro-USM: An experimental investigation on tool wear reduction and form accuracy improvement", Journal of Manufacturing Processes, Vol. 32, pp. 802-815. **(SCI, Impact Factor = 6.2)**

10. **S. Kumar,** A. Dvivedi, A. Suryawanshi, M. Tewari and A. K. Chaudhary, (2021) "Investigations and optimization of rotary tool micro-USM process for fabrication of microchannels", Materials Today: Proceedings, Vol. 45, pp. 4993-4997 (**SCOPUS INDEXED**).
11. M. Tewari, R. S. Jadoun, and **S. Kumar**, (2021) "Effect of process parameters on tensile strength of Friction stir welded butt joints of thick AA1350 aluminum plates using Taguchi experimental design", Materials Today: Proceedings, Vol. 44, pp. 2721-2725 (**SCOPUS INDEXED**).
12. **S. Kumar** and A. Dvivedi (2017)"Experimental investigation on drilling of borosilicate glass using micro-USM with and without tool rotation: a comparative study", International Journal of Additive and Subtractive Materials Manufacturing, Vol. 1(3-4), pp. 213-222 (**SCOPUS INDEXED**)..
13. **S. Kumar** and A. Dvivedi (2016) "Studies on the effect of tool rotation in microultrasonic drilling of high aspect ratio holes", International Journal of Research in Engineering and Technology, Vol. 5(13), pp. 119-121.
14. **S. Kumar**, A. Dvivedi and P. Kumar (2014) "Study of ultrasonic machining with workpiece rotation of borosilicate glass", International Journal of Mechanical Engineering and Robotic Research, Vol. 1(1), pp. 1-6 (**SCOPUS INDEXED**)..

International Conferences

1. H. K. Rai, M. Tewari, **S. Kumar,** and A. K. Chaudhary, (2022), "Experimental investigations on resistance spot welding process during joining of E43 SS4012A grade low alloy steel", Proceedings of the International Conference on Recent Innovations in Science & Technology (RIST-2022), EKC Technical Campus, Kerala.
2. **S. Kumar,** A. Dvivedi, A. Suryawanshi, M. Tewari and A. K. Chaudhary, (2021), "Investigations and optimization of rotary tool micro-USM process for fabrication of microchannels", Proceedings of the 2nd International Conference on Aspects on Material Science and Engineering (ICAMSE-2021), Punjab University Chandigarh.
3. **S. Kumar** and A. Dvivedi (2019) "Parametric investigations and optimization of rotary tool micro-USM using Taguchi methodology", Proceedings of the 6th International Conference on Production and Industrial Engineering (CPIE-2019) NIT Jalandhar.
4. R. K. Arya, **S. Kumar** and A. Dvivedi (2019) "ANFIS modelling of aspect ratio in drilling of glass using pressurized flow electrochemical discharge machining process", Proceedings of the International Conference on Precision, Meso, Micro & Nano Engineering (COPEN-11) IIT Indore.
5. **S. Kumar** and A. Dvivedi (2018) "On performance evaluation of helical grooved tool during rotary tool micro-ultrasonic machining", Proceedings of the 7th International and 28th All India Manufacturing, Design and Research (AIMTDR-2018) Conference at College of Engineering Guindy, Anna University, Chennai.
6. R. Kumar, **S. Kumar** and A. Dvivedi (2017) **"**Effect of tool geometry on performance of rotary tool micro-USM", Proceedings of the International Conference on Nano-technology, Ideas, Innovations and Initiatives (ICN3I-2017), IIT Roorkee.

7. **S. Kumar** and A. Dvivedi (2017)"Parametric effect on width overcut in rotary tool micro-ultrasonic machining", Proceedings of the International Conference on Technology & Trust (ICTT-2017)Greater Noida Institute of Technology, Greater Noida.
8. **S. Kumar** and A. Dvivedi (2016) "On comparative study of micro-ultrasonic drilling with and without tool rotation",Proceedings of the 4th International Conference on Production and Industrial Engineering (CPIE-2016) NIT Jalandhar, pp. 327-335.
9. **S. Kumar** and A. Dvivedi (2016) "Investigations on fabrication of microchannels using rotary tool micro-ultrasonic machining", Proceedings of the 6th International and 27th All India Manufacturing, Design and Research (AIMTDR-2016) Conference at College of Engineering Pune, pp. 444-447.
10. **S. Kumar** and A. Dvivedi (2016) "Fabrication of 3D complex micro-features used in bio-medical applications", Proceedings of the 3rd International Conference on Nanotechnology for Better Living (NBL-2016) NIT Srinagar, pp. 255.
11. **S. Kumar** and A. Dvivedi (2016) "Studies on the effect of tool rotation in microultrasonic drilling of high aspect ratio holes", Proceedings of the International Conference on Recent Advances in Engineering & Science (ICRAES-2016). 8th and 9th September 2016, M.S. Ramaiah Institute of Technology Bengaluru.

National Conferences

1. **S. Kumar** and A. Dvivedi (2018) "An ultrasonic micro-machining approach for fabrication of micro-molds", Proceedings of the 12thUttarakhand State Science & Technology Congress 2017-18.
2. **S. Kumar** and A. Dvivedi (2016) "Preliminary studies on rotary tool micro-ultrasonic machining process", Proceedings of the National Conference on Statistics and Analytical Methods in Production and Industrial Engineering (SAMPIE-2016), PEC University of Technology, Chandigarh, pp. 148-153.

Book Chapters

1. **S. Kumar** and A.Dvivedi (2020) "On performance evaluation of helical grooved tool during rotary tool micro-ultrasonic machining" In: Unconventional Machining and Composites. Lecture Notes on Multidisciplinary Industrial Engineering (pp. 335-345). Springer, Singapore
2. **S. Kumar** and A. Dvivedi and P. Kumar (2017) "On tool wear in rotary tool micro-ultrasonic machining", Proceedings of the 3rd Pan American Materials Congress (pp. 75-82). Springer, Cham. (**Scopus Indexed**)

PATENTS

(GRANTED)

1. A low cost portable mechanical ventilator with feedback control and respiratory monitoring with remote interface, **Grant No.-533904, Dated: 21/04/24**
2. A Concentric Tube Heat Pipe Device With Semi Hollow Cylindrical Macro Insert. **Grant No. 2023/06632, Dated: 31/01/24**

(PUBLISHED)

1. Regenerative braking system and energy generation, **Application No.:202211043398, Dated: 05/08/22.**
2. Paddle powered water pump apparatus, **Application No.:202211043400, Dated: 05/08/22.**
3. Fly ash brick making device, **Application No.:202211043402, Dated: 05/08/22.**
4. A portable handicapped crutch, **Application No.:202211043399, Dated: 05/08/22.**

ACHIEVEMENTS/SCHOLARSHIP

- Secured **All India Rank-17** in GATE-2014 in Production and Industrial Engineering.
- Secured **All India Rank-38** in GATE-2011 in Production and Industrial Engineering.
- Secured **All India Rank-63** in GATE-2020 in Production and Industrial Engineering.
- Secured **All India Rank-115** in GATE-2017 in Production and Industrial Engineering.
- Qualified GATE-2012 and GATE-2013 in Mechanical Engineering.
- Ministry of Human Resource Development, Govt. of India national fellowship for M.Tech. Program 2011-2013.
- Ministry of Human Resource Development, Govt. of India national fellowship for Ph.D. Program, 2014-2019.

SHORT TERM COURSES & WORKSHOPS ATTENDED

- One week online faculty development program on "Design for Excellence: A Step towards Innovation" organized by Design Innovation Centre, IIT Roorkee along with NIT Uttarakhand from 26-30 September, 2021.

- TEQUIP-III sponsored one week online workshop on Automation and Artificial Intelligence in Production Engineering organized by College of technology, Pantnagar Uttarakhand from 22-26 February, 2021.

- TEQUIP-III sponsored one week online short terms course on Microwave Material Processing: Opportunities and Challenges organized by NIT Uttarakhand from 14-14 December, 2020.

PROFESSIONAL MEMBERSHIP

- Life time member of the International Association of Engineers (**Member No: 276372**)

ACADEMIC EXPERIENCE

- **Position held:** Teaching Personnel
  Name of the Institute: College of Technology, Pantnagar (GBPUA&T, Pantnagar), Uttarakhand
  Period: 07 November 2023 to till date

- **Current Position held:** Assistant Professor
  Name of the Institute: Shivalik College of Engineering Dehradun, Uttarakhand
  Period: 09 May 2022 to 02 November 2022

- **Position held:** Guest Faculty (Assistant Professor)
  Name of the Institute: National Institute of Technology, Kurukshetra, Haryana
  Period: 11 August 2021 to 12 November 2021

- **Position held:** Teaching Personnel
  Name of the Institute: College of Technology, Pantnagar (GBPUA&T, Pantnagar), Uttarakhand
  Period: 17 November 2020 to 10 July 2021

- **Position held:** Assistant Professor
  Name of the Institute: Quantum Global Campus, Roorkee, Uttarakhand
  Period: 01 July 2013 to 24 December 2014

- **Position held:** Teaching Personnel
  Name of the Institute: College of Technology, Pantnagar (GBPUA&T, Pantnagar), Uttarakhand
  Period: 1 Yr (26 July 2010 to 09 June 2011

OTHER EXPERIENCE

NAAC work experience

COURSES TOUGHT

1. **Course taught at PG level**
   - Modeling and Simulation
   - Advanced Manufacturing Processes
   - Advanced Welding Technologies

2. **Course taught at UG level**
   - Manufacturing Science-I
   - Manufacturing Science-II
   - Production Technology
   - Materials Science & Technology
   - Non-conventional Machining Processes
   - Industrial Engineering & Ergonomics
   - Welding and Allied Practices
   - Production Planning and Control
   - Machine Tool Engineering
   - Engineering Drawing
   - Introduction to Micromachining Processes
   - Supply Chain Management and Logistics
   - Workshop Practices
3. **Teaching Assistance, IIT Roorkee (**July, 2015 –December, 2019**)**
   - Assisted in teaching at IIT Roorkee undergraduate/postgraduate courses
   - Manufacturing Technology-I

- Principal of Industrial Engineering
- Advanced Manufacturing Process
- Advanced Machining Process
- Quality Management
- Engineering Economy

4. **Laboratory UG & PG level**
    - Advanced Manufacturing Processes
    - Non-traditional Machining Processes
    - Manufacturing Technology-I
    - Welding & Allied Practices
    - Workshop Practices
    - Foundry Technology

LANGUAGES

- English: Fluent.
- Hindi: Native language.

SKILLS

- MATLAB programming
- Software packages: Matlab, Solidworks, Catia.
- Statistical software packages: Qualitek, Minitab, Design Expert.

REFERENCES

Dr. Akshay Dvivedi

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Phone: +91 1332 285428 (O), +91-9411176136 (M)
Email: akshaydvivedi@gmail.com

Dr. Arun Kumar Chaudhary
Associate Professor, Industrial & Production Engineering Department,
College of Technology, G.B. Pant University of Agriculture & Technology, Pantnagar
Phone: +91-7417145135 (M)
Email: aruncdme@gmail.com

I hereby declare that all the information given is correct to the best of my knowledge.

Date: 15.08.2024

Place: Pantnagar

(Sandeep Kumar)