Dr Samik Dutta

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PERSONAL INFORMATION

Mailing Address:

Qtr. No. MS-1/B-3, CMERI Colony
Durgapur 713209
West Bengal (India)

Date of Birth: 17th November, 1978

Nationality: Indian

Gender: Male

Marital Status: Married

EDUCATION

Indian Institute of Technology Kharagpur, India

- Ph. D in Mechanical Engineering in May, 2015
- *Thesis:* Tool Condition Monitoring using Digital Image Processing

National Institute of Technology, Durgapur**,** India

- Master of Technology (M. Tech.) in Mechanical Engineering on **2004**
- 1st Class with 82.4%

National Institute of Technology, Durgapur**,** India

- Bachelor of Engineering (B.E.) in Mechanical Engineering on **2002**
- 1st Class with 72.0%

WORKING EXPERIENCE

- **CSIR-Central Mechanical Engineering Research Institute, Durgapur,** India

  Affiliation: Scientist

  Department: Precision Engineering and Metrology

  Area of Research: *Tool condition monitoring, Surface metrology, Signal and image processing, Machine learning,*

  Working from 2006

- **MCKV Institute of Engineering**, Liluah, Howrah, India

Affiliation: Lecturer

Department: Automobile Engineering

Subjects taught: *Machine Design using CATIA, Engineering Mechanics and Mechanism Analysis*

Worked for 1 year 3 months (April, 2005 – June, 2006)

PROJECTS HANDLED

- **Advancement in metrology using machine vision system**
  Research output: 12 publications in International Journals and One book chapter

- **Material characterization using image processing**
  Research output: 7 publications in International Journals and 5 publications in conferences

- **Feasibility study of micro-scanning grating interferometer on a three dimensional translation stage of micro-CMM**
  Research output: 2 publications in International Journals, 2 publications in International Conferences and One design copyright

RESEARCH INTERESTS

- **Tool Condition Monitoring**
- **Signal and Image Processing**
- **Machine Learning**
- **Surface Metrology**

PUBLICATION DETAILS

- **International Journals**

  - **SCI Journals**

    On Tool Condition Monitoring

    [1] **S Dutta**, A Datta, ND Chakladar, SK Pal, S Mukhopadhyay, R Sen, 2012. Detection of tool condition from the turned surface images using an accurate grey level co-occurrence technique. ***Precision Engineering [Elsevier]***, Vol. 36 (3), pp. 458-466.

    [2] **S Dutta**, A Kanwat, SK Pal, R Sen, 2013. Correlation study of tool flank wear with machined surface texture in end milling. ***Measurement [Elsevier]***, Vol. 46 (10), pp. 4249-4260.

[3] A Datta, **S Dutta**, SK Pal, R Sen, 2013. Progressive cutting tool wear detection from machined surface images using Voronoi tessellation method. ***Journal of Materials Processing Technology [Elsevier]***, Vol. 213 (12), pp. 2339-2349.

[4] NN Bhat, K Kumari, **S Dutta**, SK Pal, S Pal, 2015, Friction Stir Weld Classification by Applying Wavelet Analysis and Support Vector Machine on Weld Surface Images, ***Journal of Manufacturing Processes [Elsevier]***, Vol. 20, pp. 274-281

[5] **Samik Dutta**, Surjya K Pal, Ranjan Sen, 2016, On-Machine Tool Prediction of Flank Wear from Machined Surface Images using Texture Analyses and Support Vector Regression, ***Precision Engineering [Elsevier]***, Vol. 43, pp.34-42.

[6] **Samik Dutta**, Surjya K Pal, Ranjan Sen, 2016, Progressive tool flank wear monitoring by applying discrete wavelet transform on turned surface images, ***Measurement [Elsevier]***, Vol. 77, pp. 388-401.

[7] **Samik Dutta**, Surjya K Pal, Ranjan Sen, 2016, Tool condition monitoring in turning by applying machine vision, ***ASME Journal of Manufacturing Science and Engineering [ASME]***, Vol. 138, p. 051008.

[8] NN Bhat, **S Dutta**, T Vashisth, S Pal, R Sen, SK Pal, Tool Condition Monitoring by SVM Classification of Machined Surface Images in Turning, ***International Journal of Advanced Manufacturing Technology*** [Springer], Vol. 83, pp. 1487-1502.

[9] **Samik Dutta**, Surjya K Pal, Ranjan Sen, 2016, Progressive tool condition monitoring of end milling from machined surface images, ***Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture [Sage]***, DOI: 10.1177/0954405416640417.

[10] NN Bhat, **S Dutta**, SK Pal, S Pal, 2016, Tool condition classification in turning process using hidden Markov model based on texture analysis of machined surface images, ***Measurement [Elsevier]***, Vol. 90, pp. 500-509.

On Material Characterization

[11] **Samik Dutta**, Arpan Das, Kaustav Barat, Himadri Roy, 2012. Automatic characterization of fracture surfaces of AISI 304LN stainless steel using image texture analysis. ***Measurement [Elsevier]***, Vol. 45 (5), pp. 1140 - 1150.

[12] A.K. Shukla, P. Das, **S. Dutta**, S. Ray, H. Roy, 2013. Failure analysis of a head gear pulley used in coal mines. ***Engineering Failure Analysis [Elsevier]***, Vol. 31, pp. 48–58.

[13] Prosenjit Das, **Samik Dutta***, Sudip K Samanta, 2013. Evaluation of primary phase morphology of cooling slope cast Al-Si-Mg alloy samples using image texture analysis. ***Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture [Sage]***, Vol. 227(10), pp. 1474-1484.

[14] **S Dutta**, K Barat, A Das, SK Das, AK Shukla, H Roy, 2014. Characterization of micrographs and fractographs of Cu-strengthened HSLA steel using image texture analysis. ***Measurement [Elsevier]***, Vol. 47, pp. 130-144.

On Dimensional Metrology

[15] Rajat Sen, Chinmoy Pati, **Samik Dutta**, Ranjan Sen, 2014, Comparison Between Three Tuning Methods of PID Control for High Precision Positioning Stage, ***MAPAN - Journal of Metrology Society of India [Springer]***, Vol. 30, pp. 65–70

- **Non - SCI Journals**

On Tool Condition Monitoring

[16] **S Dutta**, SK Pal, S Mukhopadhyay, R Sen, 2013. Application of digital image processing in tool condition monitoring: A review. ***CIRP Journal of Manufacturing Science and Technology [Elsevier]***, Vol. 6, pp. 212-232.

[17] Anurup Datta, **Samik Dutta**, Surjya K Pal, Ranjan Sen, Sudipta Mukhopadhyay, 2012. Texture analysis of turned surface images using grey level cooccurrence technique. ***Advanced Materials Research [Trans Tech Publications, Switzerland]*** Vol. 365 (2012) pp. 38-43.

On Material Characterization and failure study

[18] Prosenjit Das, **Samik Dutta**, H. Roy, R. Jayaganthan, 2011. Characterization of impact fracture surfaces under different processing conditions of 7075 Al alloy using image texture analysis. ***International Journal of Technology and Engineering System (IJTES) [Gopalax Publishers, Singapore]***, Vol. 2 (2), pp. 143-147.

[19] D Ghosh, S Dutta, AK Shukla, H Roy, 2015. Failure investigation of a cage suspension gear chain used in coal mines, ***Journal of Institution of Engineers India-Series D***, DOI 10.1007/s40033-015-0092-6.

[20] D Ghosh, M Mallik, N Mandal, **S Dutta**, H Roy, AK Lohar, 2016. Effect of experimental variables of abrasive wear on 3D surface roughness and wear rate of Al–4.5% Cu alloy. ***Journal of The Institution of Engineers (India): Series D***, DOI 10.1007/s40033-016-0110-3

On Dimensional Metrology

[21] **Samik Dutta***, Chinmoy Pati and Ranjan Sen, 2014, Simultaneous position and angular error measurement of precision positioning stages using miniature interferometer with step-size variation, ***International Journal of Precision Technology [Inder Science]***, Vol. 4, Nos. 1/2, pp. 29 – 45

- **Book Chapter**

  - **Dutta S,** Pal SK and Sen R, Digital image processing in machining, in: Davim, J.P. (Ed.), Modern Mechanical Engineering - Research, Development and Education, 2014, pp. 369–412 (Springer-Verlag Ltd., Berlin)

- **Conference**

On Tool Condition Monitoring

[1] **S. Dutta**, P. Saha, R. S. Mondal, A. J. Banerjee and R. Sen, Influence study of machining parameters on micro level surface finish of OFHC copper, in: *COPEN7- International Conference on precision, meso, micro, and nano engineering*, College of Engrg., Pune, India, December (10 to 11) 2011, pp. 73-77

On Material Characterization and failure study

[2] **S. Dutta**, K. Barat, A. Das and H. Roy, Quantitative Micrography of AISI 304LN Stainless Steel using Fractal, in: *COPEN7- International Conference on precision, meso, micro, and nano engineering*, College of Engrg., Pune, India, December (10 to 11) 2011, pp. 389-392

[3] K. Barat, **S. Dutta**, H. Roy, S. Tewari and K. K. Roy, Comparison between two image based methods to characterize cast iron microstructure, in: *National Conference on Processing and Characterization of Materials*, NIT Rourkela, India, December (2 to 3) 2011

[4] K. Barat, **S. Dutta**, H. Roy, A. Das and S. Das, Image texture-based characterization of fractographs and micrographs, in: *49th National Metallurgists' Day and 65th Annual Technical Meeting of Indian Institute of Metals (NMD-ATM)*, Hyderabad, India, November (13 to 16), 2011

[5] **S. Dutta**, H. Roy and R. Sen, An Wavelet-based Characterization of Fractographs, in: *An International Conference on precision, meso, micro and nano engineering (COPEN 8)*, NIT, Calicut, December (13 to 15, 2013), Vol 2, pp.876-880

[6] **S. Dutta**, H. Roy and R. Sen, Image Texture Analysis using GLCM Technique for Evaluation of Fractographs, in: *AdMet-2015, 4th National Conference on Advances in Metrology*, CSIR-CMERI, Durgapur, February (25 to 27) 2015, DMMV-8

On Dimensional Metrology

[7] **Samik Dutta**, Somnath Chatterjee, Ranjan Sen, Study of Accuracy of a Long-Travel-Range, Ultra-High-Resolution, Hybrid-Drive Translational Stage using Laser Interferometer, in: *AdMET-2011 – 1st National Conference on Advance in Metrology*, February (16 to 18), 2011, CMTI, Bangalore, pp. D6

[8] P. Saha, **S. Dutta**, A. J. Banerjee and R. Sen, Fabrication study of non-linear taper component for 42GHZ, 200kW, CW Gyrotron with improved surface integrity, in: *VEDA-2012*, CSIR-CEERI, Pilani, September (21 to 24, 2012), T4B.7 (pp.130-131)

[9] C. Pati, **S. Dutta** and R. Sen, A holistic design and modelling approach applied to the development of ultra-precision CMM for micro and nano metrology, in: *AdMet-2013, 8th International Conference on Advances in Metrology*, CSIR-NPL, Delhi, February (10 to 11) 2011, OP-14, pp. 78-79

[10] **Samik Dutta**, Himadri Roy and Ranjan Sen, Image texture analysis using GLCM technique for evaluation of fractographs, in: *4th National Conference on Advances in Metrology*, 25th to 27th February, 2015, CSIR-CMERI, Durgapur, India

[11] Sumanta Mukherjee, Partha Saha, Santanu Dhara, Ranjan Sen, **Samik Dutta**, Shantanu Naskar, A Comparative Study on the 2D and 3D Surface Roughness of Direct Metal Laser Sintered Ti6Al4V, in: *4th National Conference on Advances in Metrology*, 25th to 27th February, 2015, CSIR-CMERI, Durgapur, India