# Curriculum Vitae

**Personal Particulars:**


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| Name: | LIU Kui, Dr. |
| Position: | Research Engineer |
| Affiliation: | Singapore Institute of Manufacturing Technology |
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**Education Background:**

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| Nov. 1998 – Nov. 2002 | PhD, Department of Mechanical Engineering, National University of Singapore (NUS), Singapore |
| Sep. 1993 – Mar. 1996 | MEng, College of Mechanical and Electrical Engineering, Nanjing University of Aeronautics & Astronautics (NUAA), P.R. China |
| Sep. 1985 – Jul. 1989 | BEng, College of Mechanical and Electrical Engineering, Nanjing University of Aeronautics & Astronautics (NUAA), P.R. China |

**Research Interests:**

- Nano/Micro and Ultra-precision Machining
- Atomic Modeling for Nanomachining Process
- Simulation of Micro Machining
- Super Polishing for Optical Quality
- Ductile Mode Cutting of Brittle Materials
- High Speed/Hard Machining
- Micro Electro-Discharge Machining (EDM)
- Powder Metallurgy and Diamond Tool Fabrication

**Working Experience:**

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| Jan. 2005 – Present | Adjunct Assistant Professor, Department of Mechanical Engineering, National University of Singapore (NUS), Singapore. |
| Mar. 2004 – Present | Research Engineer, Machining Technology Group, Singapore Institute of Manufacturing Technology (SIMTech), Singapore |
| Jan. 2002 – Feb. 2004 | Postdoctoral Fellow, Machining Technology Group, Singapore Institute of Manufacturing Technology (SIMTech), Singapore. |
| Nov. 1998 – Jan. 2002 | Research Scholar, Department of Mechanical Engineering, National University of Singapore (NUS), Singapore. |
| Dec. 1994 – Nov. 1998 | Lecturer/Lab Supervisor (Metal Machining Laboratory), College of Mechanical and Electrical Engineering, Nanjing University of Aeronautics & Astronautics (NUAA), P.R. China |
| Jul. 1989 – Dec. 1994 | Teaching Assistant/Engineer, College of Mechanical and Electrical Engineering, Nanjing University of Aeronautics & Astronautics (NUAA), P.R. China. |

**Distinctions:**

Postdoctoral Fellowship jointly sponsored by Singapore Institute of Manufacturing Technology and National University of Singapore: 2002-2004
National University of Singapore Research Scholarship: 1998-2001
Award of Science and Technology from Aviation Industries of China: 1997
Excellent staff awarded by Nanjing University of Aeronautics & Astronautics: 1993

**Professional Service:**

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|---|---|---|
| Mar. 2003 – Present | Ex-co Member | Singapore Chapter, Society of Manufacturing Engineers |
| Aug. 2005 – Sep. 2006 | Committee Member | CNC Machining Technical working Group, WorldSkills Singapore 2006 |
| Sep. 2002 – Present | Senior Member | Society of Manufacturing Engineers |

**Publications:**

*Book Chapter*

1. F.Z. Fang, K. Liu, T.R. Kurfess and G.C. Lim. Tool-based micro machining and applications in MEMS (Chapter 2). In Mems/Nems Handbook: Techniques and Applications, Vol. III, Manufacturing Methods in MEMS/NEMS, edited by C.T. Leondes, pp. 63-126, ISBN: 0-387-24520-0, Kluwer Academic Publishers, 2005.

*Journal Papers-International Refereed*

1. K. Liu, X.P. Li, S.Y. Liang and X.D. Liu. Nanometer scale ductile mode cutting of soda-lime glass, *Journal of Manufacturing Processes*, Vol. 7, pp. 95-101, 2005.
2. K. Liu, X.P. Li, S.Y. Liang and X.D. Liu. Nanometer scale ductile mode cutting of soda-lime glass, *Transactions of the North American Manufacturing Research Institute of SME*, Vol. 32, pp. 39-45, 2004.
3. M. Sharif Uddin, K.H.W. Seah, X.P. Li, M. Rahman and K. Liu. Effects of crystalline orientation on wear of diamond tools for nano-scale ductile cutting of silicon. *Wear*, Vol. 257, pp. 751-759, 2004.
4. K. Liu, X.P. Li, M. Rahman and X.D. Liu. Study of ductile mode cutting in grooving of tungsten carbide with and without ultrasonic vibration. *International Journal of Advanced Manufacturing Technology*, Vol. 24, No. 5-6, pp. 389-394, 2004.
5. K. Liu, X.P. Li, M. Rahman and X.D. Liu. A study of the cutting modes in grooving of tungsten carbide. *International Journal of Advanced Manufacturing Technology*, Vol. 24, No. 5-6, pp. 321-326, 2004.
6. K. Liu, Y. Li, X.P. Li and M. Rahman. Ultra precision cutting of tungsten carbide in ductile mode using CBN tools. *Nanotechnology and Precision Engineering*, Vol. 2, No. 3, pp. 234-241, 2004.
7. K. Liu, X.P. Li and S.Y. Liang. Nanometer scale ductile cutting of tungsten carbide. *Journal of Manufacturing Processes*, Vol. 6, No. 2, pp. 187-195, 2004.
8. K. Liu, X.P. Li, M. Rahman and X.D. Liu. CBN tool wear in ductile cutting of tungsten carbide. *Wear*, Vol. 255, pp. 1344-1351, 2003.
9. K. Liu, X.P. Li and M. Rahman. Characteristics of high speed micro ductile cutting of tungsten carbide. *Journal of Materials Processing Technology*, Vol. 140, pp. 352-357, 2003.
10. K. Liu, X.P. Li and S.Y. Liang. Nanometer scale ductile cutting of tungsten carbide. *Transactions of the North American Manufacturing Research Institute of SME*, Vol. 31, pp. 153-160, 2003.
11. X.P. Li, M. Rahman, K. Liu, K.S. Neo and C.C. Chan. Nanoprecision measurement of diamond tool edge radius for wafer fabrication. *Journal of Materials Processing Technology*, Vol. 140, pp. 358-362, 2003.
12. K. Liu and X.P. Li. Ductile cutting of tungsten carbide. *Journal of Materials Processing Technology*, Vol. 113, pp. 348-354, 2001.
13. K. Liu and X.P. Li. Modeling of ductile cutting of tungsten carbide. *Transactions of the North American Manufacturing Research Institute of SME*, Vol. 29, pp. 251-258, 2001.
14. H.Z. Li, K. Liu, and X.P. Li. A new method for determining the undeformed chip thickness in milling. *Journal of Materials Processing Technology*, Vol. 113, pp. 378-384, 2001.
15. N. Fang, K. Liu and D.W. Zuo. Influence of processing conditions on properties of beads of diamond wire saws. *Journal of Materials Science Letters,* Vol. 17, pp. 69-71, 1998.
16. K. Liu, T. He, X.P. Li, and M. Rahman. An atomic dynamic model for nanoscale ductile mode cutting of silicon wafer material. *International Journal for Manufacturing Science and Technology*, 2005 (in press).

17. S. Arefin, X.P. Li, M. Rahman and K. Liu. The upper bound of tool edge radius for nanoscale ductile mode cutting of silicon wafer. *International Journal of Advanced Manufacturing Technology,* (in press).
18. K. Liu, X.P. Li and S.Y. Liang. The mechanism of ductile chip formation in cutting of brittle materials. *International Journal of Advanced Manufacturing Technology*, (in press).
19. K. Liu, X.P. Li, M. Rahman, K.S. Neo, C.C. Chan and X.D. Liu. A study of the effect of tool cutting edge radius on ductile cutting of silicon wafers. *International Journal of Advanced Manufacturing Technology*, (in press).
20. K. Liu, X.P. Li and M. Rahman. Characteristics of ultrasonic vibration assisted ductile cutting of tungsten carbide. *International Journal of Advanced Manufacturing Technology*, (in press).
21. M. Sharif Uddin, K.H.W. Seah, M. Rahman, X.P. Li and K. Liu, Performance of single crystal diamond tools in ductile mode cutting of silicon, Journal of Materials Processing Technology, (in press).
22. S. Arefin, X.P. Li, M.B. Cai, M. Rahman, K. Liu and A.A.O. Tay. Effect of cutting edge radius on machined surface in nanoscale ductile mode cutting of silicon wafer. *Proceedings of the Institution of Mechanical Engineers Part B – Journal of Engineering Manufacture*. (accepted).
23. K. Liu, X.P. Li, M. Rahman, and X.D. Liu. Surface characteristics of silicon wafers obtained by nanometric ductile cutting. *International Journal of Machine Tools and Manufacture*, (under review).
24. K.S. Woon, M. Rahman, F.Z. Fang, K.S. Neo and K. Liu. Numerical investigation of tool edge radius effect in micromachining. *Journal of Materials Processing Technology*, (under view).

*Journal Papers- Local/Regional Refereed*

25. X.P. Li, M. Rahman, K. Liu, K.S. Neo and C.C. Chan. An indentation method for nanoprecision measurement of diamond tool edge radius. *Journal of Xiamen University*, Vol. 41, pp.98-99, 2002.
26. K. Liu, M. Wang and D.W. Zuo. Effects of sintering technology on iron-based diamond segment wear characteristics. *Mechanical Science and Technology*, Vol. 18, No. 2, pp.306-308, 1999 (in Chinese).
27. K. Liu, M. Wang, D.W. Zuo and S.M. Mei. Study on hot-press sintering mechanism of iron-based diamond saw blade. *Cemented Carbide*, Vol. 16, No. 1, pp.8-11, 1999 (in Chinese).
28. K. Liu, D.W. Zuo and M. Wang. Wear characteristics of iron-based diamond segments on granites. *Tool Engineering*, Vol. 32, No. 12, pp.11-16, 1998 (in Chinese).
29. K. Liu, Z.F. Liu, D.W. Zuo and H.X. Zhang. Drilling machinability of small deep holes of high temperature heat-resisting alloy GH169. *Aviation Precision Manufacturing,* Vol. 34, No. 5, pp.10-12, 1998 (in Chinese).
30. D.W. Zuo, M. Wang, K. Liu and S.W. Fu. Experimental study on two-axle bending technique. *Journal of Nanjing University of Aeronautics and Astronautics*, Vol. 30, No. 5, pp.473-479, 1998 (in Chinese).
31. K. Liu, D.W. Zuo, M. Wang, L. Li and S.M. Mei. Study on heat treatment technology and wear property of iron-based diamond circular saw blade. *Journal of Nanjing University of Aeronautics and Astronautics,* Vol. 30, No. 3, pp.300-305, 1998 (in Chinese).
32. K. Liu, D.W. Zuo and M. Wang. Formula optimization of hot-press sintering explosive charge liner of petroleum perforation bullet. *Aviation Precision Manufacturing*, Vol. 34, No. 3, pp.17-19, 1998 (in Chinese).
33. D.W. Zuo, J. Wu, M. Wang and K. Liu. Application of diamond twist drill for drilling hard-brittle materials. *Transaction of Nanjing University of Aeronautics and Astronautics,* Vol. 15, No. 2, pp.216-222, 1998.
34. C.H. Zhou, D.W. Zuo and K. Liu. Application of multimedia technology on the teaching of mechanical courses. *Modern Computer,* Vol. 11, No. 2, pp.26-28, 1998 (in Chinese).
35. K. Liu, D.W. Zuo and M. Wang. Application of hot-press sintering technology to explosive charge liner of petroleum perforation bullet. *Transaction of Nanjing University of*

*Aeronautics and Astronautics,* Vol. 15, No. 2, pp.229-234, 1998.

36. J.J. Zhu, K. Liu and M. Wang. Study on sintering technology of hammers of food hammer mill. *Transaction of Nanjing University of Aeronautics and Astronautics,* Vol. 14, No. 1, pp.55-59, 1997.
37. J.J. Zhu, Y.S. Yang, K. Liu and M. Wang. Experimental research on sintered hammers for food hammer mill. *Journal of Jiangsu University of Science and Technology,* Vol. 18, No. 2, pp.64-68, 1997 (in Chinese).
38. D.W. Zuo, C.H. Zhou and K. Liu. Application study of multimedia technique on the teaching of mechanical courses. *Journal of NUAA Education*, Vol. 12, No. 1, pp.34-38, 1998 (in Chinese).
39. S.M. Mei, K. Liu and B. Su. Using multimedia technique to improve the teaching effects on the course 'metal cutting principles and tools'. *Journal of NUAA Education*, Vol. 12, No. 4, pp.82-84, 1998 (in Chinese).
40. C.H. Zhou, D.W. Zuo and K. Liu. Using multimedia technology to improve the teaching effects. *Studies on Universities' Management Improvement*, Ocean Press, pp.530-535, 1998 (in Chinese).

*Conference Papers*

1. K.S. Woon, M. Rahman, and K. Liu. A fundamental study of tool-based micromachining using finite element analysis with arbitrary Lagrangian-Eulerian method. *10th CIRP International Workshop on Modeling of Machining Operations*, Reggio Calabria, Italy, August 27-28, 2007.
2. K. Liu, G.C. Lim, H. Wu and S.T. Ng. Ultra-precision machining of micro-step array for spectrometer sensing. *The 7th International Conference of the European Society for Precision Engineering and Nanotechnology* (eu**spen**), Bremen, Germany, May 20-24, 2007.
3. K. Liu, X.D. Liu and G.C. Lim. Super polishing of stainless steel mould insert for high quality optical lens fabrication. *The 6th International Conference of the European Society for Precision Engineering and Nanotechnology* (eu**spen**), Vienna, Austria, May 28-June 1, 2006.
4. K. Liu, K. Yasutomo, X. Ding, X.D. Liu, G.C. Lim and L.B. Zhou. Ultrasonic vibration assisted electro-discharge machining (EDM) of deep micro holes. *The 6th International Conference of the European Society for Precision Engineering and Nanotechnology* (eu**spen**), Vienna, Austria, May 28-June 1, 2006.
5. K. Liu and A. Klumpp. Recycling of ball nose end-mill cutters for high speed machining of hardened stainless steel. *The 7th International Conference on Frontiers of Design and Manufacturing (ICFDM'2006)*, Guangzhou, China, June 21-24, 2006.
6. S. Arefin, K. Liu, X.P. Li and M. Rahman. Cutting conditions and tool edge radius for nanoscale ductile cutting of silicon wafer. *Proceedings of 2004 Japan-USA Symposium on Flexible Automation*, UL_031, Denver, Colorado, USA, July 19-21, 2004.
7. M. Sharif Uddin, K.H.W. Seah, M. Rahman, X.P. Li and K. Liu. Wear behavior of single crystal diamond tools in ductile mode cutting of silicon wafer materials. *Proceeding of the 3rd International Conference on Advanced Manufacturing Technology*, pp. 209-215, Pan Pacific Hotel, Kuala Lumpur, Malaysia, May 11–13, 2004.
8. T. He, K. Liu, X.P. Li and M. Rahman. A method of atomic dynamic modeling for nanometric ductile cutting of silicon wafer material. *Proceedings of International Conference on Precision Engineering 2003/2004*, pp. 409-417, Grand Hyatt Hotel, Singapore, March 2-5, 2004.
9. K. Liu and X.P. Li. Nano scale ductile cutting of brittle materials for wafer fabrication. *Workshop on High Speed Machining of Hard/Super Hard Materials sponsored by JSME-NUS*, Copthorne Orchid Hotel, Singapore, pp. 97-120, November 7-11, 2003.
10. K. Liu. Ductile micro cutting of tungsten carbide. *Workshop on High Speed Machining of Hard/Super Hard Materials sponsored by JSME-NUS*, Copthorne Orchid Hotel, Singapore, March 20-23, 2003.
11. X.P. Li, C.C. Chan, K. Liu, M. Rahman and X.D. Liu. Effect of cutting edge radius on ductile-brittle transition in cutting of silicon-wafers. *Proceedings of the 5th International*

*Conference on Frontiers of Design and Manufacturing (ICFDM'2002)*, pp. 257-262, Dalian, China, July 9-13, 2002.

12. K. Liu, X.P. Li, M. Rahman and X.D. Liu. Study on surface topography in nanometric ductile cutting of silicon wafers. *Proceedings of 4th Electronics Packaging Technology Conference*, pp. 200-205, Singapore, December 10-12, 2002.
13. K. Liu, X. P. Li and M. Rahman. Ultrasonic vibration assisted cutting of tungsten carbide. *The 10th International Manufacturing Conference in China*, Xiamen, China, Panel 1-202, October 11-13, 2002.
14. K. Liu, X.P. Li, M. Rahman and X.D. Liu. The critical conditions for ductile chip formation in grooving of tungsten carbide. *Proceedings of 2002 Japan-USA Symposium on Flexible Automation*, Volume I, pp. 157-161, Hiroshima, Japan, July 14-19, 2002.
15. K. Liu, X.P. Li, M. Rahman and X.D. Liu. Improving ductile mode cutting of tungsten carbide by ultrasonic vibration. *Proceedings of 2002 Japan-USA Symposium on Flexible Automation*, Volume I, pp. 151-156, Hiroshima, Japan, July 14-19, 2002.
16. K. Liu, X.P. Li, M. Rahman, C.C. Chan and X.D. Liu. Nanomachining technology for wafer fabrication. *Workshop on NanoScience and Engineering*, IMRE, NUS, Singapore, January 23-24, 2002.
17. K. Liu, D.W. Zuo, M. Wang and S.M. Mei. Cold-press sintering technique of iron-based diamond saw blade. *The 6th Annual Meeting of China University Society of Machining and Advanced Manufacturing, East China Chapter*, Lianyungang, China, July 22-24, 1998 (in Chinese).
18. L. Li, D.W. Zuo, K. Liu and M. Wang. Analysis of influence on the nitridation $TiO_2$ films. *The 6th Annual Meeting of China University Society of Machining and Advanced Manufacturing, East China Chapter*, Lianyungang, China, July 22-24, 1998 (in Chinese)

**Hobbies:**

Basketball, Badminton, Tennis, Music, Traveling, Reading and Cooking.