

Zhang Huali

Personal details

Date of Birth: 8/23/1977

Sex: Female

Marital Status: unmarried

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Commencement Date: April, 2008

Career objective

For a post-doc research position on nanotechnology, materials science, or related area.

Education

- ◆ 2003.9–present Harbin Institute of Technology,
Ph D degree advised by Prof. Zhang Feihu
Major in Mechanical Manufacturing and Automation, Center for Precision engineering, nanotechnology;
- ◆ 2001.9–2003.7 Harbin Institute of Technology
Master degree advised by Prof. Wang Najun;
Major in Mechanical Manufacturing and Automation
Dissertation for the master degree: Research of eccentric wear's concept on TBM cutter disc and parameterization design on lay-out of TBM cutter
- ◆ 1995.9–1999.9 Zhengzhou University of Technology
Major in Mechanical Manufacturing and Automation
Bachelor degree.

Research experience & capability

- ◆ Our university –HIT, was founded in 1920, listed as one of the top nine key university in China. After 87 years, HIT has developed into a large multi-disciplinary nationally renowned university with science, engineering and research as its core. And the center for precision engineering, where I have been studied, is conducted in an international environment and has nanotechnology research team.

- ◆ Strong background in machinery manufacturing and automation after 4 years bachelor and 2 years master education; Highly-motivated with extensive knowledge on nanotechnology, material science, nanoelectrics and carbon nanotubes after doctoral research life.
- ◆ As the key researcher for the National Nature Science Fund of China during doctoral period, No 50375040, titled as “Theoretical and experimental research on nanofabrication mechanism based on the collision dynamics of atomic physics”.
- ◆ Strong experimental background with nanomechanical testing equipment, nano-fabrication devices and surface characterization techniques, as well as skills in analysis and interpretation of data, including AFM, STM, Nanoindenter.

Project details

Project Title	: Theoretical and experimental research on nanofabrication mechanism based on the collision dynamics of atomic physics
Client	: National nature science Fund of China
Period	: 2004-2007
Operating Systems	: AFM, STM, Nanoindenter, SEM
Team Size	: 1 Prof, 1 associate Prof, 1 doctor, 2 masters;
Role	: Key researcher
Description of projects and your contribution	: The state-of-the-art research works on nanofabrication mechanism ignored quantum effects during the process. Our project is aimed at developing both theoretical and experimental analysis on nano-scaled fabrication based on quantum effects to explore the basic rule in nano-scale. And my work involves a variety of nanofabrication experiments for studying the essential mechanism of nanomachining process to prove the theoretical model we built based on quantum theory. It's combined with the fields of physics, nanoelectronics, and nanomaterials, made me have extensive knowledge in these fields. During the period, experimental challenges were met, such as how to focus on one single CNT for fracture in such a small nano-scaled size, and how to design experiments to fulfill our project aim. Research details include (1) conversion nanomachining process parameters to investigate material removal and chip behavior in nano-scaled groove using AFM; (2) CNT fracture experiments conducted by nanoindenter slope-loaded scratching; (3) interaction mechanism of STM tip and sample; (4) combining these experimental results, demonstrate the model we built based on quantum theory is accurate.

Major responsibility & achievement

- ◆ Have given presentations at professional conferences, including MicroNano China 2007 sponsored by ASME and Nanotechnology Institute.
- ◆ Independently instructed master candidates of our team during doctoral period, and their corresponding master thesis are titled as "The experimental research on the STM-based nanofabrication in electric Field in the state of atmosphere" and "Experimental study in chip formation process of AFM-based nano-scratching", respectively.
- ◆ Peer-reviewed publications in nanotechnology, including KEM, and international conferences indexed by EI.

Related Skills

- ◆ Have strong ability to work well independently as well as good teamwork, excellent dedication and communication skills to fit with diverse work environment, and interact effectively with a broad range of colleagues.
- ◆ Excellent English communication skills as well as Korean, both written and verbal.

Research Plan

- ◆ to contribute to research work on micro/nano processing technologies, nanotechnology, materials science, or related field, in an experienced team.
- ◆ to further expand my doctoral research on nanomachining mechanism via the use of scanning probe microscopy, as well as to aim for next big breakthrough.

Publication List

- [1] Experimental Study on the Fracture Mechanism of Carbon Nanotubes. Proceedings of the International Conference on Integration and Commercialization of Micro and Nanosystems 2007, 2007, pp. 619-725.
- [2] Research on Nano-scale Material Removal Process using Atomic Force Microscopy. Key Engineering Materials vol. 359-360 (2008) pp. 269-273.
- [3] Effects on the chip formation of nanomachined surface using Atomic Force Microscopy. Nanotechnology and Precision Engineering. (submitted)
- [4] Experimental research on ELID grinding and cutting performance of nano cemented carbide cutters. Key Engineering Materials Vols 291-292 (Aug 2005) pp: 115-120
- [5] Theoretical Analysis and Experiment Study of Carbon Nanotube Probe and Conventional Atomic Force Microscopy Probe on Surface Characterization. International Conference and Exhibition on Integration and Commercialization of Micro and Nanosystems 2007
- [6] Research on ELID grinding of nano-cemented carbide tools. Key Engineering Materials Vol 329 (2007) pp: 105-109.
- [7] Advances in the study of nano-scratch resistance by experiment based on nanoindenter. Machinery & Electronics 2006. 4
- [8] Experimental studies of the interaction mechanism between the tip and sample using STM. Aviation Precision Manufacturing Technology, 2007. 4

References

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