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## Tsung-Chan Tsai

Gender: Male

Date of Birth: 08/16/1982

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### RESEARCH INTERESTS

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- Plasma engineering
- Magnetism in semiconductor nanostructures
- Thin film technology
- CMOS-MEMS actuators and sensors
- Automatic control system design

### EDUCATION

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September 2009-  
present

**PhD Candidate in Department of Mechanical Engineering**, Texas A&M University, College Station, TX, USA

*Advisor:* Dr. David Staack<sup>1</sup>

*Research project:* **Polymer Deposition in Ambient Environment Conditions by Using Dielectric Barrier Discharge Plasma Jet**

September 2004-  
July 2006

**M. S. in Department of Power Mechanical Engineering**, National Tsing Hua University, Hsinchu, Taiwan

*Cumulative GPA:* 4.0/4.0 (91.5/100)

*Honor:* **2006 Phi Tau Phi Member, Taiwan**

*Thesis Title:* **Design and Control of Two-Dimensional Vertical Comb-Drive Micromirrors in an Optical-Tweezers System**

*Thesis Advisor:* Dr. Rongshun Chen<sup>2</sup>

September 2000-  
June 2004

**B. S. in Department of Mechanical Engineering**, National Chung Cheng University, Chiayi, Taiwan

*Cumulative GPA:* 3.50/4.0 (81.85/100)

*Undergraduate Research Project Title:* **Development of an Excimer Laser Based Submicron Fabrication System and Its Application to Manufacturing of Metallic Free-Form Micro Molds**

*Project Execution Time:* May 2003-November 2003

*Project Director:* Dr. Jeng-Rong Ho<sup>3</sup>, Dr. Jungwei Cheng<sup>4</sup>, and Dr. Rong-Shine Lin<sup>5</sup>

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## WORK EXPERIENCE

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- January 2008-  
July 2009                      Research Assistant, Institute of Physics, Academia Sinica, Taipei, Taiwan  
*Lab Director:* Dr. Yung Liou<sup>6</sup>
- January 2007-  
January 2008                      Corporal, Ministry of National Defense R. O. C. (Taiwan)  
*Responsibility:* Psychological Counseling
- September 2006-  
December 2006                      Substitute Teacher and Section Chief of Hygiene, Chu-Lian Primary School,  
Hsinchu, Taiwan  
*Course offered:* Nature Science

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## ORAL PRESENTATIONS

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1. **T.-C. Tsai** and D. Staack, "Plasma-Enhanced Polymer Deposition in Ambient Environment Conditions Using Dielectric Barrier Discharge Plasma Jet," *International Conference on Plasma Science 2010*, on June 21-25(2010), Norfolk Waterside Marriott, USA.

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## PUBLICATIONS

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- Journal articles**                      1. **T.-C. Tsai**, Y. M. Lan, Y. C. Chi, M. S. Lee, K. L. You, and Y. Liou, "Magnetism in Semiconductor Nanoparticles: Ge Nanoparticles for Example," *Taiwan Nano Newsletter* (2009). (in Chinese)
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- Conference papers**                      1. **T.-C. Tsai** and R. Chen, "A Novel Two-Dimensional Curled-Hinge Comb-Drive Micromirror using CMOS-MEMS Fabrication Process," *Asia-Pacific Conference of Transducers and Micro-Nano Technology 2006*, on June 25-28 (2006), Marina Mandarin Hotel, Singapore.
2. **T.-C. Tsai**, R. Chen and H.-T. Hsieh, "Combined Adaptive and Sliding Control of Vertical Comb-Drive Micromirrors," *The 10th Nano and Microsystem Technology Conference*, on November 30-December 1 (2006), Industrial Technology Research Institute, Taiwan.

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## HONORS AND AWARDS

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- June 2006                      Member of **The Phi Tau Phi Scholastic Honor Society**, Taiwan
- November 2005                      Hsinchu Kuan Di Temple Foundation Scholarship
- March 2004                      **3<sup>rd</sup> place** in the National Contest of Student Project, "Precise Mechatronical Design and Integration," Ministry of Education
- March 2004                      **5<sup>th</sup> place** in the National College Soccer Match
- July 2003                      Fongshan Buddhist Lotus Society Scholarship
- December 2002                      Kaohsiung City Government Scholarship

## **ASSISTANTSHIP**

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### **Research Assistant (RA)**

September 2005-  
July 2006      Project of Veterans General Hospitals University System of Taiwan Joint  
Research Program

*Project Title:* Driving and Control for the Mirror Array and Bio Manipulation  
Platform in a Nano and Micro Bio Structure Assembly System (II)

*Project Director:* Dr. Rongshun Chen<sup>2</sup>

September 2004-  
July 2005      Project of Veterans General Hospitals University System of Taiwan Joint  
Research Program

*Project Title:* Driving and Control for the Mirror Array and Bio Manipulation  
Platform in a Nano and Micro Bio Structure Assembly System (I)

*Project Director:* Dr. Rongshun Chen<sup>2</sup>

### **Teaching Assistant (TA)**

June 2010-Present      Department of Mechanical Engineering, Texas A&M University

*Courses assisted:* Fluidic Mechanics

September 2009-  
May 2010      Department of Mechanical Engineering, Texas A&M University

*Courses assisted:* Engineering Analysis for Mechanical Engineers

September 2004-  
January 2006      Department of Power Mechanical Engineering, National Tsing Hua University

*Courses assisted:* Applied Electronics, Electronics Lab, and Seminar

## **HARDWARE & SOFTWARE EXPERIENCE**

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### **Hardware**

Plasma techniques: Dielectric barrier discharge (DBD) plasma jet

Fabrication equipments: Wet-bench, Molecular beam epitaxy (MBE), and Atmospheric pressure  
chemical vapor deposition (APCVD)

Measurement equipments: Scanning electron microscope (SEM), X-ray diffraction (XRD), Vibrating  
Sample Magnetometer (VSM), Atomic scanning microscope (AFM), X-ray photoelectron  
spectroscopy (XPS), Fourier transform infrared spectroscopy (FTIR), and Profilometer

### **Software**

Electronic circuit simulation software: HSPICE and PSPICE

MEMS simulation software: CoventorWare

Simulation & computation software: Labview and MATLAB

Layout software: Cadence Tool

Programming language: C/C++

## **CERTIFICATES**

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March 23, 2006	7 hours Course of MATLAB & Simulink for Control Design
January 26-27, 2006	16 hours Verilog Training Course
August 4-5, 2004	14 hours VLSI Laboratory Course-Advance Processing Equipment
July 19-22, 2004	30 hours Course of Microsystem & Nanotechnology
July 12-16, 2004	30 hours VLSI Training Course-Advance Processing for VLSI Technology

## **EXTRACURRICULAR ACTIVITIES**

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September 2004- June 2006	Member of Power Mechanical Engineering Department Soccer Team in National Tsing Hua University
September 2001- June 2004	Member of College Soccer Team in National Chung Cheng University
September 2000- June 2004	Member of Mechanical Engineering Department Soccer Team in National Chung Cheng University
September 2002- June 2003	Director of Academic Affairs in Mechanical Engineering Student Association in National Chung Cheng University
September 2000	Activities Director in Freshman Camping Trip for Mechanical Engineering Department in National Chung Cheng University

## **REFERENCES**

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1. Dr. David Staack, Department of Mechanical Engineering, Texas A&M University, +1-979-845-4063, [dstaack@tamu.edu](mailto:dstaack@tamu.edu)
2. Dr. Rongshun Chen, Department of Power Mechanical Engineering, National Tsing Hua University, +886-3-5742596, [rchen@pme.nthu.edu.tw](mailto:rchen@pme.nthu.edu.tw)
3. Dr. Jeng-Rong Ho, Department of Mechanical Engineering, National Chung Cheng University, +886-5-2720411 (ext: 33316), [imejrho@ccu.edu.tw](mailto:imejrho@ccu.edu.tw)
4. Dr. Jungwei Cheng, Department of Mechanical Engineering, National Chung Cheng University, +886-5-2720411 (ext: 33315), [imecheng@ccu.edu.tw](mailto:imecheng@ccu.edu.tw)
5. Dr. Rong-Shine Lin, Department of Mechanical Engineering, National Chung Cheng University, +886-5-2720411 (ext: 33300), [imelin@ccu.edu.tw](mailto:imelin@ccu.edu.tw)
6. Dr. Yung Liou, Institute of Physics, Academia Sinica, +886-2-27896723, [yung@phys.sinica.edu.tw](mailto:yung@phys.sinica.edu.tw)