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ChangKai (Lance) Wu  
willing to relocate

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## OBJECTIVE

Researcher or Engineer in Metallurgy

## EDUCATION

Worcester Polytechnic Institute (WPI), Worcester, MA

**Ph.D, Material Science and Engineering**

May 2012

**Master of Science, Material Science and Engineering** GPA 3.72

May 2008

National Taiwan University of Science and Technology, Taipei, Taiwan

**Bachelor of Engineering, Polymer Engineering**

June 2004

**RESEARCH**, Worcester Polytechnic Institute, Advisor: Dr. Makhlof M. Makhlof

**“Predicting Response of Aluminum Casting Alloys to Heat Treatment”**, Ph.D. Dissertation, 2008 - Present

Created a model that enables predicting the changes in mechanical properties of cast aluminum alloy components in response to precipitation hardening heat treatment

**“Evaluation of Distortion and Residual Stresses Caused by Heat Treatment of Cast Aluminum Alloy Components”**,

Master thesis, 2006 - 2008

Developed an extensive database and a computer model that was specifically for the A356.2 aluminum cast alloy to predict the distortion and residual stresses due to heat treatment

## TECHNICAL SKILLS

FEM Softwares: MAGMA (v4, v5), ABAQUS with user-subroutines, COMSOL, ANSYS

Code Languages: FORTRAN, Python

Other Softwares: JMat Pro, SolidWorks, AutoCAD, Pandat

Lab Techniques: CNC programming and machining, Permanent and Sand mold castings, Mechanical Tests (Hardness, impact, elevated temp tensile and compressive tests), Thermal conductivity measurements, Heat Transfer Coefficient measurements, SEM, XRD, and OES

## WORK EXPERINCE

### Research Assistant

Advanced Casting Research Center, Metal Processing Institute, Worcester, MA

Sept 2006 – May 2012

- Predicting heat-treated properties of cast aluminum alloy components using numerical technique
- Generating material database including thermal, physical and mechanical properties
- Validating computer model predictions by various measurements on commercial casting parts
- Developing, managing and maintaining laboratory equipment and apparatus

### Military Experience

R.O.C. Marine Corps, Taiwan

Sept 2004 - March 2006

- Ground combat force
- Mobile vehicles operation

## PUBLICATION & PRESENTATION

- **Chang-Kai Wu** and Makhlof M. Makhlof, “A Mathematical Model and Computer Simulations for Predicting the Response of Aluminum Casting Alloys to Heat Treatment,” Symposium: Cast Shop for Aluminum Production, TMS Annual Meeting 2012. (accepted)
- **Chang-Kai Wu** and Makhlof M. Makhlof, “Modeling the Response of Aluminum Alloy Castings to Precipitation Hardening Heat Treatment,” 116th Metalcasting Congress, AFS Annual Meeting 2012, Columbus, OH. (accepted)
- **Chang-Kai Wu** and Makhlof M. Makhlof, “Predicting Response of Aluminum Casting Alloys to Heat Treatment,” Light Metals 2011, pp. 431-440.
- **Chang-Kai Wu** and Makhlof M. Makhlof, “An Integrated Heat Treatment Model for Cast Aluminum Alloys,” Symposium: Integrated Computational Materials Engineering. Materials Science & Technology 2011, Columbus, OH.
- **Chang-Kai Wu** and Makhlof M. Makhlof, “Predicting Residual Stresses Caused by Heat Treating Cast Aluminum Alloy Components,” Shape Casting: 3rd International Symposium 2009.