

# Michael J. King

32 Linden Avenue #1  
Somerville, MA 02143

(617) 777-3223  
mking@mit.edu

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## **Objective**

Research or development position in mechanical engineering with evolving challenges spanning multiple disciplines.

## **Specializations**

Mechanics of Materials, Multi-scale Mechanics, Finite Element Analysis, Simulation, Programming, Mechanical Design

## **Education**

### **Massachusetts Institute of Technology, Cambridge, MA**

*September 2001 – Present*

Doctor of Philosophy in Mechanical Engineering (*Expected June 2006*)

GPA: 5.0 (out of 5.0)

Major: Mechanics of Materials

Thesis Title: *A General Continuum Model for the Mechanical Behavior of Woven Fabrics Including Slip and Failure*

Minor: Business Management (focus on law, negotiation, and managerial psychology)

Masters of Science in Mechanical Engineering (*June 2003*)

GPA: 5.0 (out of 5.0)

Thesis Title: *An Energy-Based Constitutive Model for the In-Plane Mechanical Behavior of Woven Fabrics*

### **Northeastern University, Boston MA**

*September 1996 – June 2001*

Bachelor of Science in Mechanical Engineering, Summa Cum Laude (*June 2001*)

GPA: 3.98 (out of 4.00)

Thesis Title: *Using Finite Element Analysis to Investigate the Dynamic Behavior of a MEMS Micro-switch*

Capstone Project: *Design of an anti-siphon controllable shunt valve for treating hydrocephalus*

## **Work Experience**

### **Research Assistant – MIT Department of Mechanical Engineering**

*June 2002 – Present*

Studied high performance woven fabrics (e.g. Kevlar®). Performed mechanical experiments and developed theories and computational models using both commercial and self-written analysis codes. Served as a laboratory equipment steward and system administrator for a high speed computing cluster.

### **Graduate Tutor– MIT Department of Mechanical Engineering**

*September 2005 – Present*

Tutored small groups of students in advanced undergraduate-level mechanics.

### **Teaching Assistant – MIT Department of Mechanical Engineering**

*September 2001 – December 2001*

Worked as a teaching assistant for an undergraduate mechanics course. Prepared homework, exams, and solutions, tutored the students, gave review lectures, and organized and directed student laboratory exercises.

### **Temporary Assistant Staff - MIT Lincoln Laboratory, Lexington MA**

*June 1999 – August 2001*

*Secret Security Clearance Received*

Performed developmental research and finite element analysis on civilian and military technologies in optical systems engineering division. Studied thermo-mechanical interactions, structural optimization, and fatigue analysis problems.

### **Assistant Project Engineer - Velcro USA Inc., Manchester NH**

*January 1999 – March 1999*

Provided engineering support to Manufacturing and to R&D Department. Performed material tracking, supplier and vendor interactions, technical document compilation, tooling design, and design/drafting support.

### **Engineering Technician - Velcro Group, Manchester NH**

*March 1998 – June 1998*

Designed and evaluated product test procedures in R&D Department. Conducted micromechanical research and experimentation on new woven and non-woven hook and loop products.

### **Assistant Process Engineer - Parker Chomerics Inc., Woburn MA**

*June 1997 – December 1997*

Provided engineering support to extrusions business unit. Performed process testing and analysis, tooling design and improvement, computer aided design, and industrial practice optimization (e.g. scrap reduction).

## **Other Activities**

**Co-founder/Co-Director – *Vocal Band Aid Inc., Somerville MA*** *March 2004 – Present*  
Helped found 501(3)(c) charity dedicated to preserving musical education in public schools, and assisted in organization of annual Vocal Band Aid concert benefit events. Served on board of directors.

**Co-founder/Assistant Director/Arranger – *Vocal Band Integration by Parts*** *June 2001 – Present*

## **Special Skills**

General Software:	MS Office (Word, Excel, PowerPoint), LaTeX, HTML
Drafting and Design:	AutoCAD, CADKey, <b>SolidWorks</b>
Programming:	C, C++, <b>FORTRAN, Matlab</b>
Analysis:	ANSYS, PATRAN/NASTRAN, <b>ABAQUS</b> , FEMLab, MOLDY, ADINA, original codes
Laboratory Experience:	Uniaxial and biaxial tensile test machines, custom designed test apparatuses

## **Awards and Honors**

Warren Rohsenow Fellowship – <i>MIT Department of Mechanical Engineering</i>	<i>January 2002 – June 2002</i>
Elected to Tau Beta Pi Honors Society – <i>Northeastern University</i>	<i>May 2001</i>
Carl S. Ell Scholarship – <i>Northeastern University</i>	<i>September 1996 – June 2001</i>

## **Publications**

M.J. King, P. Jearanaisilawong, and S. Socrate, “A Continuum Constitutive Model for the Mechanical Behavior of Woven Fabrics”, *International Journal of Solids and Structures*, 42:3867 (2005).

M.J. King and S. Socrate, “A Mesostructurally-Based Shell Formulation to Model the Deformation Response of Woven Fabrics”, submitted to the *Journal of Applied Mechanics*, (2005).

## **Presentations**

M.J. King and S. Socrate, “A method for developing a continuum model for in-plane fabric behavior”, Proceedings of the Second M.I.T. Conference on Computational Fluid and Solid Mechanics, Cambridge, MA, June 17 - 20, 2003.

M.J. King and S. Socrate, “A Constitutive Model for the Mechanical Behavior of Woven Fabrics in Planar Deformation”, Proceedings of the 2003 ASME International Mechanical Engineering Congress & Exposition, Washington, D.C., November 16-21, 2003.

M.J. King and S. Socrate, “A Shell Formulation to Model the Three-dimensional Deformation Response of Woven Fabrics”, Proceedings of the 41st Annual SES Meeting, Lincoln, NE, October 10-13, 2004.

M. J. King and S. Socrate, “A Shell Formulation to Model the Three-dimensional Deformation Response of Woven Fabrics”, Proceedings of the 2004 ASME International Mechanical Engineering Congress & Exposition, Anaheim, CA, November 13-19, 2004.

M.J. King and S. Socrate, “A Continuum Anisotropic Shell Formulation to Model the Three-Dimensional Deformation Response of Woven Fabrics”, Proceedings of the 5<sup>th</sup> International Conference on Computation of Shell and Spatial Structures, Salzburg, Austria, June 1-4, 2005.

M.J. King and S. Socrate, “A Continuum Anisotropic Shell Formulation to Model the Three-dimensional Deformation Response of Woven Fabrics”, Proceedings of the Third M.I.T. Conference on Computational Fluid and Solid Mechanics, Cambridge, MA, June 14-17, 2005.