

## Michael Raulli

Department of Mechanical Engineering  
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Villanova, PA 19085

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## Research Interests

Shape and Topology Optimization of Multiphysics systems, Multiscale Methods, Computational Software Development, Nanomechanics, Reliability based optimization

## Education

*University of Colorado, College of Engineering*; Boulder, Colorado  
‡ Doctor of Philosophy in Aerospace Engineering Sciences May 2004  
‡ Master of Science in Aerospace Engineering Sciences May 2002  
*Villanova University, College of Engineering*; Villanova, Pennsylvania  
‡ Bachelor of Science in Civil Engineering; Minor in History May 2000

## Professional Experience

*Assistant Professor* Aug 2004 - Present  
‡ Villanova University, Department of Mechanical Engineering  
*Research Assistant* May 2001 - July 2004  
‡ University of Colorado, Department of Aerospace Engineering  
*Teaching Assistant* Aug 2000 - May 2001  
‡ University of Colorado, Department of Aerospace Engineering

## Honors

*University of Colorado*  
‡ Sandia National Laboratory Fellow for Microsystem Research Aug 2002 - May 2004  
‡ 2nd MIT Conf. on Comp. Mech., Young Researcher Fellowship June 2003  
‡ University Fellowship from the Graduate School Aug 2000 - May 2001  
‡ University of Colorado at Boulder Grant Aug 2000 - May 2001  
*Villanova University*  
‡ Dean's Award for Academic Excellence, College of Engineering May 2000  
‡ Dean's Award for Meritorious Service, College of Engineering May 2000

## Teaching and Advising

‡ ME 3402, ME 3403 - *Solid Mechanics and Design I & II*  
‡ ME 7200 - *Optimal Design*  
‡ Masters students - 2 current; Undergraduate - 1 current

## Extracurricular Activities

*Volunteer Work*  
‡ Construction/student advising for orphanage; Posa Verdes, Honduras Jan 2005 - Present  
‡ Engineering assistance for rural village; Farza, Afghanistan Apr 2002  
*Villanova involvement*  
‡ Faculty advisor for Engineers Without Borders Sep 2005 - Present  
‡ Member of University Committee for Mission and Social Justice Sep 2005 - Present

## Research Grants

‡ *Characterization and Modeling of Nano-Structured Ceramics* - Advanced Ceramics Research (Oct 2005 - Present)

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### Journal Publications:

1. **M. Raulli**, R. Poola Subramanyaswamy and K. Maute, "Reliability Based Design Optimization of MEMS Considering Pull-in," Submitted to *Computers and Structures*
2. **M. Raulli** and K. Maute, "Topology optimization of electrostatically actuated microsystems," *Structural and Multidisciplinary Optimization* Published Online July 28, 2005.
3. **M. Raulli** and K. Maute, "Optimization of Fully Coupled Electrostatic-Fluid- Structure Interaction Problems," *Computers and Structures* 83(2-3): 221-233, 2005.
4. M. Allen, **M. Raulli**, K. Maute and D.M. Frangopol, "Reliability-Based Analysis and Design Optimization of Electrostatically Actuated MEMS," *Computers and Structures*, 82(13-14):1007-1020, 2004
5. J. S. Kong, D.M. Frangopol, **M. Raulli**, K. Maute, R.A. Saravanan, L.-A. Liew, and R. Raj, "A methodology for analyzing the variability in the performance of a MEMS actuator made from a novel ceramic," *Sensor and Actuators A: Physical*, 116(2):336-344, 2004.
6. K. Maute and **M. Raulli**, "An Adaptive Interactive Method for Computer Aided Optimal Design," *Computer and Structures*, 82(1):71-79, 2004

### Conference Proceedings:

1. **M. Raulli**, "Electro-mechanical Topology Optimization Considering Non-matching Meshes," *IUTAM Symposium on Topological Design Optimization of Structures, Machines and Materials, Oct 26-29, 2005, Copenhagen, Denmark*
2. **M. Raulli**, Rajesh Poola Subramanyaswamy and Kurt Maute, "Reliability based design optimization of analog micro-mirror using pull-in criteria," *Proceedings of International Conference on Structural Safety and Reliability, June 19-23, 2005, Rome, Italy*
3. **M. Raulli** and K. Maute, "Topology Optimization of Electrostatic MEMS," *Proceedings of 10th AIAA/ISSMO Conference on Multidisciplinary Analysis and Optimization, Aug. 30 - Sep. 2, 2004, Albany, NY*
4. **M. Raulli** and K. Maute, "Fully Coupled Analysis and Sensitivity Analysis for Electrostatic-Fluid-Structure Interaction Problems," *2nd MIT Conference on Computational Mechanics June 17-20 2003, Cambridge, MA, 1497-1500*
5. **M. Raulli** and K. Maute, "Symbolic Geometric Modeling and Parameterization for Multiphysics Shape Optimization," *Proceedings of 9th AIAA/ISSMO Conference on Multidisciplinary Analysis and Optimization, September 4-6, 2002, Atlanta, GA.*