Vincent Y. Blouin
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EDUCATION

University of Michigan, Ann Arbor, MI
Ph.D., Naval Architecture and Marine Engineering — December, 2001
Research Advisor: Dr. Michael M. Bernitsas
Redesign of Submerged Structures by Large Admissible Perturbations

University of Michigan, Ann Arbor, MI
M.S., Mechanical Engineering — May, 1999

University of Michigan, Ann Arbor, MI
M.S., Naval Architecture and Marine Engineering — May, 1999

Ecole Centrale Nantes, Nantes, France
Diplôme d'ingénieur (B.S. equivalency) Mechanical Engineering — June, 1993

PROFESSIONAL EXPERIENCE

Assistant Professor — 2007-Present
School of Architecture,
School of Materials Science and Engineering,
Clemson University, Clemson, SC

Visiting Assistant Professor — 2005-2006
Department of Mechanical Engineering, Clemson University, Clemson, SC

Postdoctoral Research Associate — 2000-2005
Department of Mechanical Engineering, Clemson University, Clemson, SC
Sponsor: Automotive Research Center (ARC), a U.S. Army TACOM Center of Excellence

Research Assistant — 1995-2000
Department of Naval Architecture and Marine Engineering, University of Michigan, Ann Arbor, MI.

Visiting Scholar — 1993-1995
Department of Naval Architecture and Marine Engineering, University of Michigan, Ann Arbor, MI.
Sponsor: Elf Aquitaine Production, France.

Engineering Intern — May-September 1992
Elf Aquitaine Production, Pau, France.

CONSULTING EXPERIENCE

Michelin Americas Research & Development Corp., Greenville, SC — Summer, 2006
Modeling, analysis and design of metallic non-pneumatic tires (tweels) for space applications

David Tein Consultants, Ltd., Houston, TX — May, 1998
Nonlinear mechanics of marine risers and pipes under random excitation

Chevron, Houston, TX — Fall, 1997
Topology and shape optimization of an inverse tripod structure for offshore applications

TEACHING EXPERIENCE

Clemson University

ARCH 699 – Advanced Structural and Mechanical Systems	Spring 2007
ME 202 – Foundations of Mechanical Systems	Fall 2005
ME 205 – Computer Methods in Engineering	Spring 2006
EM 304 – Mechanics of Materials	Summers 2001, 2002, 2005
ME 305 – Modeling and Analysis of Dynamic Systems	Summer 2004
ME 306 – Fundamentals of Machine Design	Springs 2004, 2006
ME 402 – Internship in Engineering Design	Falls 2005, 2006, Spring 2006
ME 415 – Undergraduate Research in Engineering	Spring 2007

University of Michigan

ENG 101 – Computers and Programming in Engineering	Spring 2000
NA 500 – Engineering Analysis in the Marine Environment (Teaching Assistant)	Fall 1999

HONORS AND AWARDS

Best Paper Award, Hu, Y., Blouin V. Y., Fadel G. M., "Design for Manufacturing of 3D Heterogeneous Objects with Processing Time Consideration," Design for Manufacturing and the Life Cycle Conference, 2005.

Best Paper Award, Blouin V. Y., Bernitsas M. M., and Morrison D. G., "Integrated Redesign of Large Scale Structures by Large Admissible Perturbations," 21st International Conference on Offshore Mechanics and Arctic Engineering, Offshore Technology Symposium, 2002.

Full membership, Sigma Xi, The Scientific Research Society, 2001.

Benton Fellowship, The University of Michigan, 1995-1997.

FUNDED RESEARCH

Michelin Americas Research & Development Corp. – "Conceptual Development for Lunar Tweel Shear Band", September to December 2006, $19K, Principal investigator.

Edmund Optics – "Manufacturing of Precision Molded Aspheric Optics", August 2006 to May 2007, Investigator.

School of Materials Science and Engineering, Clemson University - "Structural analysis of H.L. Hunley", August 2006 to May 2007, Principal Investigator.

National Science Foundation – "Augmented Lagrangian Coordination for Decomposed Design Problems", August 2006 to July 2009, $363K, Principal investigator.

General Motors – "Computer support tool for real-time luggage packing", November 2005 to April 2006, $35K, Principal investigator.

PUBLICATIONS

Refereed Journal Articles

Bernitsas M. M., **Blouin V. Y.**, "Structural Redesign for Forced Response Amplitude with Proportional Damping by Large Admissible Perturbations," *AIAA Journal*, Vol. 37, No. 11, 1999, pp. 1506-1513.

Blouin V. Y., and Bernitsas M. M., "Redesign of Submerged Structures by Large Admissible Perturbations," *Journal of Offshore Mechanics and Arctic Engineering*, ASME Transactions, Vol. 123, No. 3, 2001, pp. 103-111.

Huang J., Fadel G. M., **Blouin V. Y.**, Grujicic M., "Bi-Objective Optimization Design of Functionally Gradient Materials," *Journal of Materials and Design*, Vol. 23, 2002, pp. 657-666.

Blouin V. Y., Bernitsas M. M., Morrison D., "Integrated Redesign of Large Scale Structures by Large Admissible Perturbations," *Journal of Offshore Mechanics and Arctic Engineering*, ASME Transactions, Vol. 125, No. 4, 2003, pp. 234-241.

Li Y., Fadel G. M., Wiecek M., **Blouin V. Y.**, "Minimum Effort Approximation of the Pareto Space of Convex Bi-criteria Problems," *Optimization and Engineering*, Vol. 4, No. 3, 2003, pp. 231-261.

Blouin V. Y., Samuels H. B., Fadel G. M., Haque I. U., Wagner J. R., "Continuously Variable Transmission Design for Optimum Vehicle Performance by Analytical Target Cascading," *International Journal of Heavy Vehicle Systems, Special Issue on Advances in Ground Vehicle Simulation*, Vol. 11, No. 2/3, 2004, pp. 327-348.

Blouin V. Y., Bernitsas M. M., "Cognate Space Identification for Forced Response Structural Redesign," *Journal of Offshore Mechanics and Arctic Engineering*, ASME Transactions, Vol. 127, No. 3, August, 2005, pp. 227-233.

Hu Y., Fadel G. M., **Blouin V. Y.**, White D. R., "Optimal Design for Additive Manufacturing of Heterogeneous Objects Using Ultrasonic Consolidation," *Virtual and Physical Prototyping*, Vol. 1, No. 1, March, 2006, pp. 53-62.

Neal J. Y., **Blouin V. Y.**, Fadel G. M., "GA-Based Multi-Material Structural Optimization Using Stepwise Mesh Refinement," *Journal of Structural and Multidisciplinary Optimization,* submitted, August 2004.

Hunt B., **Blouin V. Y.**, Wiecek M. M., "Relative Importance of Design Criteria: A Preference Modeling Approach," *ASME Journal of Mechanical Design*, submitted, January 2005.

Conference Articles

Bernitsas M. M., **Blouin V. Y.**, "Redesign of Structures by the Method of Large Admissible Perturbations," *Thirteenth National Congress of Applied Mechanic*s, Gainesville, FL, June 21-26, 1998.

Blouin V. Y., "Treatment of Damping in Structural Redesign by Large Admissible Perturbations," *ASME, Noise Control and Acoustics Division (Publication) NCA*, Vol. 26, 1999, pp. 35-42.

Blouin V. Y., and Bernitsas M. M., "Redesign of Submerged Structures by Large Admissible Perturbations," *Proceedings of the 19th International Conference on Offshore Mechanics and Arctic Engineering* (OMAE '00), Paper #4212, New Orleans, LA, Feb. 2000.

Blouin V. Y., Bernitsas M. M., Morrison D., "Integrated Redesign of Large Scale Structures by Large Admissible Perturbations," *Proceedings of 21st International Conference on Offshore Mechanics and Arctic Engineering*, Paper #1172, Rio de Janeiro, Brazil, June 2002. **Offshore Technology Symposium Best Paper Award**.

Fadel G. M., Konda S., **Blouin V. Y.**, Wiecek M. M., "Epsilon-Optimality in Bi-Criteria Optimization," 43rd AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials Conference, Denver, Colorado, April 22-25, 2002.

Blouin V. Y., Bernitsas M. M., "Cognate Space Identification for Forced Response Structural Redesign," *Proceedings of the 21st International Conference on Offshore Mechanics and Arctic Engineering* (OMAE '02), Paper #28135, Oslo, Norway, June 23-28, 2002.

Neal J. Y., **Blouin V. Y.**, Fadel G. M., "GA-Based Multi-Material Structural Optimization Using Stepwise Mesh Refinement," 9th AIAA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Atlanta, GA, September, 2002.

Miao Y., **Blouin, V. Y.**, Fadel, G. M., "Multi-Objective Configuration Optimization with Vehicle Dynamics Applied to Midsize Truck Design," ASME/DETC Design Automation Conference, September, Chicago, IL, 2003.

Blouin V. Y., Miao Y., Fadel G. M., "An Assessment of Configuration Design Methodologies" 10th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Albany, NY, Aug. 30-Sept. 1, 2004.

Blouin V. Y., Summers J., Fadel G. M., Gu J., "Intrinsic Analysis of Decomposition and Coordination Strategies for Complex Design Problems" 10th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Albany, NY, Aug. 30-Sept. 1, 2004.

Miao Y., **Blouin V. Y.**, Fadel G. M., "Packaging of Medium Tactical Vehicle Equipped with Hybrid Propulsion System and Fuel Cell APU," 30th Design Automation Conference, ASME/DETC, Salt Lake City, UT, Sept. 28-Oct. 3, 2004,.

Hu Y., **Blouin V. Y.**, Fadel G. M., "Incorporating Manufacturability Constraints into the Design Process of Heterogeneous Objects," Intelligent Systems in Design and Manufacturing VI, SPIE's International Symposium on Optics East, Philadelphia, PA, October 25-28, 2004.

Srivastava, N., **Blouin Y. V.**, Haque, I. U., "Using Genetic Algorithms to Identify Initial Operating Conditions for a Transient CVT Model," IMECE: Dynamic Systems and Control, Advanced Automotive Technologies, Anaheim, CA, November 13-19, 2004.

Blouin V. Y., Lassiter J., Wiecek M., Fadel G. M., "Augmented Lagrangian Coordination for Decomposed Design Problems," 6th World Congresses of Structural and Multidisciplinary Optimization, Rio de Janeiro, Brazil, 30 May - 03 June, 2005.

Fadel G. M., Haque I., **Blouin V. Y.**, Wiecek M., "Multi-Criteria Multi-Scenario Approaches in the Design of Vehicles," 6th World Congresses of Structural and Multidisciplinary Optimization, Rio de Janeiro, Brazil, 30 May - 03 June, 2005.

Engau A., Wiecek M. M., **Blouin V. Y.**, "Tradeoff-Based Decomposition for Large-Scale Multiobjective Programs," International Conference in Operations Research and Management Science, Honolulu, Hawaii, July, 2005.

Hu Y., **Blouin V. Y.**, Fadel G. M., "Design for Manufacturing of 3D Heterogeneous Objects with Processing Time Consideration," 2005 Design for Manufacturing and Life Cycle Conference, ASME/DETC, Long Beach, CA, Sept. 24-28, 2005. **Design for Manufacturing and Life Cycle Conference Best Paper Award.**

Blouin V. Y., Oschwald M., Hu Y., Fadel G. M., "Design of Functionally Graded Structures for Enhanced Thermal Behavior," 31st Design Automation Conference, ASME/DETC, Long Beach, CA, Sept. 24-28, 2005.

Dong H., Fadel G. M., **Blouin V. Y.**, "Packing Optimization by Enhanced Rubber Band Analogy," 31st Design Automation Conference, ASME/DETC, Long Beach, CA, Sept. 24-28, 2005.

Dong H., Fadel G. M., **Blouin V. Y.**, "Vehicle Component Layout with Shape Morphing – An Initial Study," 32nd Design Automation Conference, ASME/DETC, Philadelphia, PA, September 10-13, 2006, submitted, January 2006.

Blouin V. Y., Fadel G. M., Summers J. D., Fenyes P., "Three-Dimensional Packing by Heuristic-based Sequential Genetic Algorithm," 11th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Portsmouth, VA, September 2006, submitted, January 2006.

Invited Publication

Fadel, G. M., **Blouin, V. Y.**, Haque, I. U., "Continuously Variable Transmission Design for Optimum Vehicle Performance by Analytical Target Cascading," *Business Briefing: Global Automotive Manufacturing & Technology*, April, 2003.

GRADUATE STUDENT ADVISING

As advisor

Wang Y. – Augmented Lagrangian Coordination (PhD, current)

As committee member

Hu Y. - Design for manufacturing of heterogeneous objects (PhD, 2005)
Srinivasan A. - Case base reasoning and similarity modeling for exemplar authoring (PhD, current)
Dong H. - Configuration design of vehicles with shape morphing (PhD, current)
Rexavier R. - Optimization of the ultrasonic consolidation process (MS, current)
Smith G. - Exploration of qualitative design space: DOE and Morphological Charts (MS, current)

As non-voting committee member

Konda S. - Multi-criteria optimization in engineering design (MS, 2000)
Saminathan M. - Design and optimization of multi-material structures (MS, 2000)
Neal J. - Design and optimization of multi-material structures (MS, 2002)
Singh V. - Multi-scenario multi-criteria optimization (MS, 2002)
Gu J. - Multidisciplinary optimization for large scale system design (PhD, 2003)
Srinivasan V. - Optimization of automotive thermal management system (MS, 2003)
Oschwald M. - Design of heterogeneous brake rotor for optimal thermal behavior (MS, 2004)
Slusser B. - Analysis of hysteresis in heavy vehicle suspension (MS, 2004)
Zhou P. - Solid model representation (PhD, 2004)
Hunt B. - Modeling of relative importance of criteria in multi-criteria optimization (PhD, 2004)
Miao Y. - Configuration design of vehicles (PhD, 2005)
Faulkenberg S. - Configuration design with evolving shape objects (MS, 2005)
Srivastava N. - Modeling of Continuously Variable Transmission (PhD, current)
Engau E. - Decision Support for Multi-Criteria Engineering Design (PhD, current)

PROFESSIONAL AFFILIATIONS

American Society of Mechanical Engineers (ASME)	1998-present
American Institute of Aeronautics and Astronautics (AIAA)	2002-present
International Council on Systems Engineering (INCOSE)	2005-present
Society of Naval Architects and Marine Engineers (SNAME)	1996-2003
The Scientific Research Society (Sigma Xi)	2001-2003

PROFESSIONAL ACTIVITIES AND SERVICE

Conferences

Review Coordinator, ASME/DETC/Design for Manufacturing and Life Cycle Conference, 2005.

Review Coordinator, ASME/DETC/Design for Manufacturing and Life Cycle Conference, 2006.

Session Chair, 31st Design Automation Conference: DAC-8-2 Industrial Applications - Long Beach, CA, September 24-28, 2005.

Session Chair, 2005 Design for Manufacturing and the Life Cycle Conference: DFMLC-1-8 Decriptions of innovative layered fabrication processes and methods - Long Beach, CA, September 24-28, 2005.

Reviewer of publications

AIAA Journal
International Design Engineering Technical Conferences
International Journal of Heavy Vehicle Systems
Journal of Mechanical Design
Journal of Offshore Mechanics and Arctic Engineering
Journal of Ship Research
Structural and Multidisciplinary Optimization Journal

Other service

Student representative, Graduate Student Forum, Horace H. Rackham School of Graduate Studies, The University of Michigan, 1998-1999.

PROFESSIONAL DEVELOPMENT

Enriching Scholarship – University of Michigan 2000
A week of seminars and workshops on integrating teaching, information, and technology to enhance teaching and learning experiences

Preparing for Academic Careers in Science and Engineering – University of Michigan 1999
Seminar by R. Reis from Stanford University Learning Laboratory

Chris Loving Leadership Seminar – University of Michigan 1999

SOFTWARE DEVELOPMENT

Suite of stochastic optimization algorithms in Matlab and C++: Genetic Algorithms, Simulated Annealing, Latin Hypercube Sampling for Design of Experiments. Clemson University, 2002-2004.

RESTRUCT: Redesign of Structures by Large Admissible Perturbations, Naval Architecture and Marine Engineering, The University of Michigan, 1995-2000.

DYNARI-3D.V3: Dynamic large deformation three-dimensional finite element analysis of marine risers, Naval Architecture and Marine Engineering, The University of Michigan, 1993-1995.