Curriculum Vitae
for

Kevin F. Hulme

Research Associate
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EDUCATION

Ph.D.   Mechanical Engineering, University at Buffalo, February, 2000
　　　Title: *The Design of a Simulation-based Framework for the Development of Solution Approaches in Multidisciplinary Design Optimization*

M.S.   Mechanical Engineering, University at Buffalo, February, 1996
　　　Title: *Development of CASCADE - A Multidisciplinary Design Optimization Test Simulator for Use in Distributed Computing Environments*

B.S.   Mechanical Engineering, University at Buffalo, June, 1994
　　　(*Magna Cum Laude graduation distinction; School of Engineering Dean's List, University at Buffalo, Spring 1993 & Fall 1989*)

TECHNICAL INTERESTS

Engineering Optimization Methods, Scientific Visualization & Virtual Reality, Multidisciplinary Design Synthesis, Computer Aided Design & Engineering, Parallel Computing & Numerical Methodologies, Systems & Control, Solid Mechanics, Structural Analysis

EMPLOYMENT HISTORY

6/00 – present
Research Associate
New York State Center for Engineering Design and Industrial Innovation (NYSCEDII)

Responsibilities:
- Engineering optimization programming specialist for industry projects
- Graphics programming and CAD modeling for academic and industrial research projects
- Preliminary research and simulation on the Moog 2000E 6 DOF motion platform
- Industrial and academic outreach and promotion
- Graduate and undergraduate student advisement

Research Projects:

(**Academic**)
- Development of a dynamic virtual motion base computer model (June, 2002 – present)
- Interactive control mechanism development for 6 DOF motion base (January, 2002 - present)
- *The Vertebrate Analyzer* – Sabretooth tiger (Smilodon) analysis (August, 2001 – present)
- Development of a virtual roller coaster simulation (November, 2002 – May, 2003)
- Emergency facility modeling for structural retrofit (May, 2001)
- Watershed terrain visualization (April, 2001 – May, 2001)

(**Industry**)
- Re-design of and design of experiments for a cordless grease gun (May, 2004 – present)
- Heat Exchanger design and optimization for plant design (October, 2003 – present)
- Specialty mattress re-design: optimization and visualization (June, 2002 - present)
- Childseat Restraint System re-design: analysis and visualization (January, 2002 - present)
- Optimal plant layout: numerical optimization and design visualization (June, 2001 – present)

2/00 – 5/00
Post Doctoral Fellow
Department of Mechanical and Aerospace Engineering, University at Buffalo, Buffalo, NY
- Responsibilities: Research proposal writing, graduate student advisement, research laboratory administration, continued academic research in the field of MDO

8/94 – 1/00
Research Assistant
(Funded by National Science Foundation, grants DMI9553210 and DMI9622314)
Department of Mechanical and Aerospace Engineering, University at Buffalo, Buffalo, NY

6/97 - 8/97
Engineering Intern
Xerox Corporation, TTM-Engineering Systems Division, Webster, NY
- Re-design of the pre- and post-processing computer tool used for paper-path force analysis.
- Development of a decision tool for weld-design, coded in Visual Basic.

5/92 - 8/92, 5/94 - 8/94, 1/95
Engineering Intern
Cascades Niagara Falls Inc., Niagara Falls, NY
- Analysis of the steam and condensate system layout, using AutoCAD.

HONORS AND AWARDS

AIAA Foundation John Leland Atwood Graduate Award, 2000-2001
Member of the "Who's Who in Science and Engineering", Millennium (5th) Edition, 2000-2001
SUNY at Buffalo Graduate School Excellence in Teaching Award, 1999-2000

TEACHING ACTIVITIES

- Department of Mechanical and Aerospace Engineering, University at Buffalo, Buffalo, NY

Dates:	Abbreviation:	Course title:
8/01 - 12/01	MAE 473/573	Graphics in Computer Aided Design
1/01 - 5/01	MAE 552	Heuristic Optimization Methods
8/99 – 12/99		
8/00 – 12/00	MAE 415	Analysis of Structures
8/99 - 12/99	MAE 550	Engineering Optimization I
8/95 - 5/96	MAE 477/577	Computer Aided Design Applications (I-DEAS) (Teaching Assistant)

Senior Design Project – MAE 459

Spring, 2003:

Description: Design of a position-adjustable foot pedal mount to allow for ergonomic, on-board driver control of our 6 D.O.F. motion platform.
(Student: Brian Haas)

Fall, 2001:

Description: Design of a cosmetic themed shell for a 6 D.O.F. motion base, equipped with passenger restraints, and a cockpit control panel.
(Students: Manus O'Donnell, Matthew Geier, Patricia Young, Sibbie Kurian, Wadie Shubaibar, Tim Dietrich, Yueh Shiuan Ghoo, Michael Pitirri)

- NYSCEDII, University at Buffalo, Buffalo, NY

Workshop in Scientific Visualization & Virtual Reality for High School students
June, 2001, July, 2002, August, 2002, July, 2003

- Planned and organized all teaching activities and student exercises for workshops
- Instructed the basics of simulation used in scientific visualization, with ANSI C
- Supervised student project work performed in both OpenGL and VRML languages
- Conducted a workshop on *applied* visualization – "Sabretooth tiger analysis"

COMPUTATIONAL ABILITIES

- Programming languages: ANSI C, OpenGL, Fortran, Java, Visual Basic, HTML, VRML
- Graphics: Adobe Photoshop, 3D Studio Max
- Commercial optimizers: ADS, CONMIN, DOT
- CAD/CAE: Pro/Engineer, I-DEAS, AutoCAD, ANSYS
- Parallel computing: Message Passing Interface (MPI), Parallel Virtual Machine (PVM)

PUBLICATIONS - ARCHIVED JOURNALS

- Hulme, K.F., and Bloebaum, C.L., "A Simulation-based Comparison of Multidisciplinary Design Optimization Solution Strategies using CASCADE." *Structural and Multidisciplinary Optimization*, Volume 19, Number 1, March, 2000, pp. 17-35.
- Becker, J.C., Bloebaum, C.L., and Hulme, K.F., "Distributed Computing for Multidisciplinary Design Optimization Using Java." *Structural Optimization*, Volume 14, Number 4, December, 1997, pp. 203-218.
- McCulley, C., Hulme, K.F., and Bloebaum, C.L., "Simulation-based Development of Heuristic Strategies for Complex System Convergence." *Applied Mechanics Review*, Vol. 50, Number 11, Part 2, 1997, pp. S117-S124.
- Hulme, K.F., and Bloebaum, C.L., "Development of a Multidisciplinary Design Optimization Test Simulator." *Structural Optimization*, Vol. 14, Number 2-3, October, 1997, pp. 129-137.

SEMINARS AND RESEARCH-RELATED PRESENTATIONS

- Hulme, K.F., "Simulation-based Multidisciplinary Design Optimization and Applied Optimization in Scientific Visualization." IE 590 Distinguished Lecture Series, Pennsylvania State University, April, 2002.
- Jalil, M.K., and Bloebaum, C.L., Hulme, K.F. (*presenter*), Development of a Collaborative Virtual Environment for Finite Element Simulation." 9th International Conference on Human-Computer Interaction, New Orleans, LA, August, 2001.
- Hulme, K.F., and Bloebaum, C.L., "A Heuristic Convergence Strategy for Multidisciplinary Analysis." Student Research Competition and Poster Presentation for the Sigma Xi Scientific Research Society, University at Buffalo, Buffalo, NY, April, 1999.

PUBLICATIONS - PEER-REVIEWED CONFERENCE PROCEEDINGS

- Hulme, K.F., "A GPU-Based Hybrid GA/SA Implementation for All-at-Once Multidisciplinary Optimization." Tenth AIAA/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Albany, New York, September, 2004. (accepted for presentation)
- Hulme, K.F., and Pancotti, A.P., "Development of a Virtual 6 D.O.F. Motion Platform for Simulation and Rapid Synthesis." 45th AIAA/ASME/ASCE/AHS/ASC Structures and Structural Dynamics, and Materials Conference, Palm Springs, California, April, 2004.
- Galganski, R., Hulme, K.F., Patra, A., Vusirikala, N., and Hatziprokopiou, I., "Integrated Sled Testing, Computer Modeling, and Scientific Visualization for Crashworthy Child Restraint System Design." Intelligent Transportation Systems Safety and Security Conference, Miami, Florida, March, 2004.
- Hulme, K.F., Patra, A., Galganski, R, Vusirikala, N., and Hatziprokopiou, I., "A Virtual Prototyping Toolkit for Assessment of Child Restraint System (CRS) Safety." Society of Automotive Engineers 2004 World Congress, Detroit, Michigan, March, 2004.
- Hulme, K.F., Mendel, F.C., and Chugh, K.P., "Development of a Computational Toolkit for Biomechanical Analysis and Simulation: The Vertebrate Analyzer." ICSA 16th International Conference on Computer Applications in Industry and Engineering, Las Vegas, Nevada, November, 2003.

PUBLICATIONS - PEER-REVIEWED CONFERENCE PROCEEDINGS (cont.)

- Hulme, K.F., Patra, A., Galganski, R, and Vusirikala, N., "Development of a Visualization Module for Madymo-based Child Restraint System (CRS) Safety Simulation." TNO MADYMO 5th Users' Meeting of the The Americas, Troy, Michigan, October, 2003.
- Hulme, K.F., "Development of a Monty Hall analog for Heuristic All-at-Once Optimization." Ninth AIAA/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Atlanta, Georgia, September, 2002.
- Hulme, K.F., "Simulation-based Tools and Techniques for Increased Efficiency in Multidisciplinary Design Optimization." Thirty-ninth AIAA Aerospace Sciences Meeting and Exhibit, Graduate Awards Presentations, Reno, NV, January, 2001.
- Hulme, K.F., Bloebaum, C.L., and Nozaki, Y., "A Performance-based Investigation of Parallel and Serial Approaches to Multidisciplinary Analysis Convergence." Eighth AIAA/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Long Beach, CA, September, 2000.
- Hulme, K.F., and Bloebaum, C.L., "Development of a Simulation-based Framework for Exploiting New Tools and Techniques in Multidisciplinary Design Optimization." First ASMO UK/ISSMO Conference on Engineering Design Optimization, Ilkley, West Yorkshire, United Kingdom, July, 1999, pp. 179-186.
- Hulme, K.F., and Bloebaum, C.L., "A Comparison of Formal and Heuristic Strategies for Iterative Convergence of a Coupled Multidisciplinary Analysis." Third World Congress on Structural and Multidisciplinary Optimization, Amherst, NY, May, 1999 (CD Proceedings).
- Hulme, K.F., and Bloebaum, C.L., "A Comparison of Solution Strategies for Simulation-based Multidisciplinary Design Optimization." 7th AIAA/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, St. Louis, MO, September, 1998, pp. 2143-2153.
- Hulme, K.F., and Bloebaum, C.L., "Development of a Web-based Analysis Tool - A Preliminary Component for a Multidisciplinary Optimization Framework." ASME Mid-Atlantic Graduate Student Technical Conference, Pennsylvania State University, April, 1997.
- Hulme, K.F., and Bloebaum, C.L., "Development of CASCADE - A Multidisciplinary Design Test Simulator." Sixth AIAA/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Bellevue, WA, September, 1996, pp. 438-447.

WHITE PAPERS

- Hulme, K.F., "The NYSCEDII "PVM-Joystick for Windows" (PJW) API: A White Paper." Describes a computational protocol for establishing HID (joystick) non-heterogeneous Ethernet communication with a 6 D.O.F. motion base, using DirectInput and PVM.

GRANTS

Title	Source	Duration	Amount
• "Design of Experiments for a Cordless Grease Gun" (*P.I.*)	Meritool	5/1/04 – 8/31/04	$ 15,000 (pending)
• "Development of a Virtual 6 D.O.F. Motion Platform for Simulation and Rapid Synthesis" (*P.I.*)	NSF - DMII	9/1/04 – 8/31/06	$ 228,907 (pending)
• "The Vertebrate Analyzer: A Simulator to Analyze Form, Function, and Behavior of Extant and Extinct Vertebrates" (*co-P.I.*)	NSF - ITR	9/1/04 – 8/31/07	$ 1,100,000 (pending)
• "Development of a BAHX rating Tool" (*P.I.*)	Praxair	10/1/03 – 6/1/04	$ 25,000
• "Virtual Prototyping and Simulation for Pressure Ulcer Management" (*co-P.I.*; P.I.: Dr. K. English)	NYS CAT	8/1/03 – 7/31/04	$ 33,000
• "FEM Modeling of Child Seats During Crash" (*senior staff*; P.I.: Dr. A. Patra)	CUBRC	5/02 – 9/04	$ 57,000
• "Re-design of ISOFLEX Mattress" (*senior staff*; P.I.: N. Randall, co-PI: A. Patra)	Gaymar/ SPIR	5/1/02 – 11/1/02	$ 20,000
• "Integration and Implementation of a Distributed Multi-package Coldbox Optimization and Visualization Design Capability" (*senior staff*; P.I. Dr. C.L. Bloebaum)	Praxair	1/1/02 – 12/31/02	$ 103,000
• "Presidential Faculty Fellow (PFF): Development of Methods for MDO" (*graduate researcher*; PI: Dr. C.L. Bloebaum)	NSF	9/95 – 8/00	$ 500,000
• "Optimal Networking for Integrated Design Engineering" (*graduate researcher*; PI: Dr. C.L. Bloebaum)	UB	5/94 – 7/95	$ 20,000

ADVISEMENT ACTIVITIES

Student research assistance and advisement
(Department of Mechanical and Aerospace Engineering, University at Buffalo)
- B.S.: Steven Korzelius (*Internet development*, 2004)
  Brian Haas (*Motion base cueing strategies*, 2003)
  Anthony Pancotti (*CAD, FEM, and data parsing*, 2003)
  Timothy Nordberg (*CAD, FEM, and data parsing*, 2003)
  Jung Leng Foo (*CAD and VR modeling*, 2002)
  Khurram Khan (*CAD*, 2002)
- M.S.: Amit Phatak (*Topology optimization for specialty mattress re-design*, 2003)
  Anuj Jain (*Parallel Optimization strategies for Industrial plant re-design*, 2002)
  Yuji Nozaki (*Clustering and parallel optimization*, 2002)
  Mala Gosakan (*Convergence and task sequencing in MDO*, 2001)
- Ph.D.: Chen-Hung Huang (*Multi-objective CSSO*, 2003)

ADVISEMENT ACTIVITIES (cont.)

Undergraduate Mentorship
(Department of Mechanical and Aerospace Engineering, University at Buffalo)
- Douglas Braswell, Gary D'Silva, Varujan Dulgerian, Shannon Flanders, Joe McHale, Chris Palian (Fall, 2000)
- Tyson Behnke, Benjamin Bowen, Marc Buchholz, Adam Gibson, Giovan Scialdone, Randell Sierens, Justin Scheifflee (Fall, 2001)
- Bruce Abbott, Gregory Brown, Zachary Chamberlain, Kristine Godios, Justin Klein, David Welby (Fall, 2002)

PROFESSIONAL ACTIVITIES

Paper Reviews
- ICSA 16th International Conference on Computer Applications in Industry and Engineering, Las Vegas, Nevada, November, 2003.
- 2002 ASME/Mechanical Dynamics Student Mechanism Design Competition. 27th ASME Mechanisms and Robotics Conference, Montreal, Canada, September, 2002.
- ASME Design Theory and Methodology Conference, Montreal, Canada, September, 2002
- ASME Design Theory and Methodology Conference, Baltimore, Maryland, September, 2000
- 3rd ISSMO/UBCAD/UB/AIAA World Congress of Structural and Multidisciplinary Optimization (WCSMO-3), Amherst, New York, May, 1999

MEMBERSHIPS AND AFFILIATIONS

- United States Racquetball Association – Member, November, 1998
- Western New York Racquetball Association - Member, November 1998
- American Society of Mechanical Engineers - Associate Member, September 1996
- American Institute of Aeronautics & Astronautics - Associate Member, September 1996
- American Coaster Enthusiasts (ACE) - Member, August 1993
- Pi Tau Sigma (national Mechanical Engineering fraternity), February, 1993
- Golden Key national honor society, October, 1992

ACTIVITIES - CONFERENCE COORDINATION

The Third World Congress on Structural and Multidisciplinary Optimization (WCSMO-3)
Amherst, NY, May 17-21, 1999.

- On-line short paper verification, abstract reviews, and paper acceptance decisions
- Paper abstract categorization and sequencing into related Session Topics
- Creation of the preliminary and final versions of the Conference Program
- Publication of the short and long paper proceedings (Hard Bound and CD-Rom)

REFERENCES

Dr. Kevin Chugh
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Pathology and Anatomical Sciences
204 Farber Hall, Buffalo, NY 14260
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Mechanical & Aerospace Engineering
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