

Imme Ebert-Uphoff
Research Faculty
Department of Electrical and Computer Engineering
Colorado State University
Fort Collins, CO 80523

I. EARNED DEGREES

- | | | | |
|------------------------------|------------------------|----------------------------------|------|
| • Ph.D. | Mechanical Engineering | The Johns Hopkins University | 1997 |
| • M.S. | Mechanical Engineering | The Johns Hopkins University | 1996 |
| • Diplom
(Equiv. to M.S.) | Mathematics | University of Karlsruhe, Germany | 1993 |

II. EMPLOYMENT

- **Since March 2011: Research Faculty**
Department of Electrical and Computer Engineering
Colorado State University, Fort Collins, CO.
- **August 2006 – May 2011: Adjunct Associate Professor**
George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology
and
Adjunct Associate Professor
School of Interactive Computing, Robotics and Intelligent Machines Center, Georgia Institute of Technology, Atlanta, GA.
- **July 2004 – August 2006: Associate Professor (tenured)**
George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA.
On Educational Leave from August 2004 to August 2006.
- **Oct. 1998 – June 2004: Assistant Professor**
George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA.
- **Oct. 1997 - Aug. 1998: Post-Doctoral Researcher**
Dept. of Mechanical Engineering, Laval University, Québec, Canada
Funded through a post-doctoral fellowship of the German Academic Exchange Service (DAAD).
- **1993-1997: Research Assistant**
Dept. of Mechanical Engineering, The Johns Hopkins University, Baltimore, MD

III. HONORS AND AWARDS

- IEEE Conference on Robotics and Automation **Best Video Award**, 2004.
- **SME Outstanding Young Manufacturing Engineer Award**, 2001
- **CETL BP/Amoco Junior Faculty Teaching Excellence Award**, 2000.
- **NSF CAREER Award**, 2000.
- 1997-1998 **DAAD Post-Doctoral Fellowship**. A competitive one-year grant to conduct research at Laval University in Québec City, Canada awarded by the German Academic Exchange Service (DAAD)

IV. SCHOLARLY ACCOMPLISHMENTS

A. Proceedings and Book Chapters

- [B1] I. Ebert-Uphoff, C.M. Gosselin, D.W. Rosen, T. Laliberte, “Rapid Prototyping for Robotics”, book chapter in “Cutting Edge Robotics”, Pro Literatur Verlag, Mammendorf, Germany, 2005, pp. 17-46.
- [B2] C.M. Gosselin and I. Ebert-Uphoff, editors, *Proceedings of the Workshop on Fundamental Issues and Future Research Directions for Parallel Mechanisms and Manipulators*, Québec City, QC, Canada, Oct 2002. Published in two versions: Printed Proceedings (359 pages) and CD Proceedings.

B. Journal Publications

- [J1] I. Ebert-Uphoff, Y. Deng, ”A New Type of Climate Network based on Probabilistic Graphical Models: Results of Boreal Winter versus Summer”, *Geophysical Research Letters*, vol. 39, L19701, 7 pages, doi:10.1029/2012GL053269, October 2012.
- [J2] I. Ebert-Uphoff, Y. Deng, ”Causal Discovery for Climate Research Using Graphical Models”, *Journal of Climate*, Vol. 25, No. 17, doi:10.1175/JCLI-D-11-00387.1, Sept 2012, pp. 5648-5665.
- [J3] P. Bosscher, A. Riechel, I. Ebert-Uphoff, “Wrench-Feasible Workspace Generation for Cable-Driven Robots”, *IEEE Transaction on Robotics*, vol. 22, no. 5, October 2006, pp. 890-902.
- [J4] K. Kozak, W. Singhose, I. Ebert-Uphoff, “Performance Measures for Input Shaping and Command Generation”, *ASME Journal of Dynamic Systems, Measurement and Control*, vol. 128, pp. 731-736, 2006.
- [J5] P.A. Voglewede, I. Ebert-Uphoff, “Overarching Framework for Measuring Closeness to Singularities of Parallel Manipulators”, *IEEE Transactions on Robotics*, vol. 21, no. 6, Dec 2005, pp. 1037 – 1045.
- [J6] P.A. Voglewede, I. Ebert-Uphoff, “Application of the Antipodal Grasp Theorem to Cable-Driven Robots”, *IEEE Transactions on Robotics*, vol. 21, no. 4, Aug 2005, pp. 713 – 718.
- [J7] A.X.H. Dang, I. Ebert-Uphoff, “Active Acceleration Compensation for Transport Vehicles Carrying Delicate Objects”, *IEEE Transactions on Robotics*, Vol. 20, No. 5, Oct 2004, pp. 830 – 839.
- [J8] P.A. Voglewede, I. Ebert-Uphoff, “Application of Workspace Generation Techniques to Determine the Unconstrained Motion of Parallel Manipulators”, *ASME Journal of Mechanical Design*, vol. 126, no. 2, March 2004, pp. 283-290.
- [J9] K. Kozak, I. Ebert-Uphoff, W. Singhose, “Locally Linearized Dynamic Analysis of Parallel Manipulators and Application of Input Shaping to Reduce Vibration”, *ASME Journal of Mechanical Design*, vol. 126, no. 1, Jan. 2004, pp. 156-168.
- [J10] I. Ebert-Uphoff, “Introducing Undergraduate Students to Parallel Manipulators Through Hands-on Experiments”, *IEEE Robotics & Automation Magazine*, special issue on “Robotics in Education”, Vol. 10, No. 3, pp. 13-19, Sept 2003.
- [J11] I. Ebert-Uphoff, K. Johnson, “Practical Considerations for the Use of Static Balancing for Parallel Kinematic Machines”, *IMechE Journal of Multi-body Dynamics*, Special issue, Vol. 216, Part K, pp. 73-85, 2002.
- [J12] I. Ebert-Uphoff, J.-K. Lee, H. Lipkin, “Characteristic Tetrahedron of Wrench Singularities for Parallel Manipulators with Three Legs”, *IMechE Journal of Mechanical Engineering Science (Part C)*, Special issue on Spatial Mechanisms, Vol. 216, No. C1, pp. 81 - 93, 2002.
- [J13] I. Ebert-Uphoff, J.F. Gardner, W.R. Murray, R. Perez, “Preparing for the Next Century: The State of Mechatronics Education”, *IEEE/ASME Transactions on Mechatronics*, Vol. 5, No. 2, pp. 226-227, June 2000.

- [J14] I. Ebert-Uphoff, C.M. Gosselin, and T. Laliberté, “Static Balancing of Spatial Parallel Platform Mechanisms – Revisited”, *ASME Journal of Mechanical Design*, Vol. 122, No. 1, pp. 43-51, March 2000.
- [J15] I. Ebert-Uphoff and G. Chirikjian, “Discretely Actuated Manipulator Workspace Generation by Closed-Form Convolution”, *ASME Journal of Mechanical Design*, pp. 245-251, Vol 120, June 1998.
- [J16] G. Chirikjian and I. Ebert-Uphoff, “Numerical Convolution on the Euclidean Group with Applications to Workspace Generation”, *IEEE Transactions on Robotics and Automation*, pp. 123-136, Vol.14, No. 1, Feb. 1998.
- [J17] A. Pamecha, I. Ebert-Uphoff and G. Chirikjian, “Useful Metrics for Modular Robot Motion Planning”, *IEEE Transactions on Robotics and Automation*, vol. 13, no. 4, pp. 531-545, August 1997.
- [J18] G. Chirikjian, A. Pamecha and I. Ebert-Uphoff, “Evaluating Efficiency of Self-Reconfiguration in a Class of Modular Robots”, *Journal of Robotics Systems*, vol. 13, no. 5, pp. 317-38, 1996.
- [J19] I. Ebert-Uphoff and G. Chirikjian, “Efficient Workspace Generation for Binary Manipulators with Many Actuators”, *Journal of Robotics Systems*, vol. 12, no. 6, pp. 383-400, 1995.

C. Refereed Conference Publications

- [C1] S. Wolff, I. Ebert-Uphoff, “Preliminary Results on Generating Assembly Sequences for Shape Display”, Proceedings of the ASME International 26th Computers and Information in Engineering Conference (CIE), Philadelphia, PA, Sept 10-13, 2006, paper number DETC2006-99233.
- [C2] P. Bosscher, I. Ebert-Uphoff, “Disturbance Robustness Mesasures for Underconstrained Cable-Driven Robots”, 2006 IEEE International Conference on Robotics and Automation, Orlando, FL, May 15-19, 2006, pp. 4205-4212.
- [C3] I. Ebert-Uphoff, P.A. Voglewede, “On the Connections between Cable-Driven Robots, Parallel Manipulators and Grasping”, 2004 IEEE International Conference on Robotics and Automation, Vol. 5, pp. 4521-4526, New Orleans, LA, April 26 - May 1, 2004.
- [C4] P.A. Voglewede, I. Ebert-Uphoff, “Measuring ”Closeness” to Singularities for Parallel Manipulators”, 2004 IEEE International Conference on Robotics and Automation, Vol. 5, pp. 4539-4544, New Orleans, LA, April 26 - May 1, 2004.
- [C5] P. Bosscher, I. Ebert-Uphoff, “A Stability Measure for Underconstrained Cable-Driven Robots”, 2004 IEEE International Conference on Robotics and Automation, Vol. 5, pp. 4943-4949, New Orleans, LA, April 26 - May 1, 2004.
- [C6] P. Bosscher, I. Ebert-Uphoff, “Wrench-Based Analysis of Cable-Driven Robots”, 2004 IEEE International Conference on Robotics and Automation, Vol. 5, pp. 4950-4955, New Orleans, LA, April 26 - May 1, 2004.
- [C7] A.T. Riechel, I. Ebert-Uphoff, “Force-Feasible Workspace Analysis for Underconstrained, Point-Mass Cable Robots”, 2004 IEEE International Conference on Robotics and Automation, Vol. 5, pp. 4956-4962, New Orleans, LA, April 26 - May 1, 2004.
- [C8] P. Bosscher, I. Ebert-Uphoff, “Digital Clay: Architecture Designs for Shape-Generating Mechanisms”, 2003 IEEE International Conference on Robotics and Automation, vol. 1, 2003, pp. 834-841.
- [C9] P. Bosscher, I. Ebert-Uphoff, “A Novel Mechanism for Implementing Multiple Collocated Spherical Joints”, 2003 IEEE International Conference on Robotics and Automation, vol. 1, 2003, pp. 336-341.
- [C10] K. Kozak, I. Ebert-Uphoff, P.A. Voglewede, W. Singhose, “Concept Paper: On the Significance of the Lowest Natural Frequency of a Parallel Manipulator as a Performance Measure for Concurrent Design”, Proceedings of the Workshop on Fundamental Issues and Future Research Directions for Parallel Mechanisms and Manipulators, Québec City, QC, Canada, Oct 2002, pp. 112-118.

- [C11] K. Kozak, I. Ebert-Uphoff, "Review of the Role of Quasi-Coordinates for the Kinematic and Dynamic Modeling of Parallel Manipulators", Proceedings of the Workshop on Fundamental Issues and Future Research Directions for Parallel Mechanisms and Manipulators, Québec City, QC, Canada, Oct 2002, pp. 328-338.
- [C12] P.A. Voglewede, I. Ebert-Uphoff, "Two Viewpoints on the Unconstrained Motion of Parallel Manipulators at or near Singular Configurations", IEEE International Conference on Robotics and Automation, Washington, D.C., pp. 503 - 510, May, 2002.
- [C13] K. Kozak, I. Ebert-Uphoff, W. Singhose, "Analysis of Varying Natural Frequencies and Damping Ratios of a Sample Parallel Manipulator Throughout Its Workspace Using Linearized Equations of Motion", Symposium on Dynamics and Vibration of Robotic Systems, Proceedings of the ASME Design Engineering Technical Conferences, Pittsburgh, PA, Paper # DETC2001/VIB-21529, Sept 2001.
- [C14] V.K. Chan, I. Ebert-Uphoff, "Investigation of the Deficiencies of Parallel Manipulators in Singular Configurations Through the Jacobian Nullspace", IEEE International Conference on Robotics and Automation, vol. 2, pp. 1313 - 1320, Seoul, Korea, May 2001.
- [C15] M. Decker, A. Dang, I. Ebert-Uphoff, "Motion Planning for Active Acceleration Compensation", IEEE International Conference on Robotics and Automation, vol. 2, pp. 1257 - 1264, Seoul, Korea, May 2001.
- [C16] K. Johnson, I. Ebert-Uphoff, "Development of a Spatial Statically-Balanced Parallel Platform Mechanism", Proceedings of the Year 2000 Parallel Kinematic Machines International Conference and Second European-American PKM Forum, Ann Arbor, MI, pp. 143-159, Sept 2000.
- [C17] B. Geving, I. Ebert-Uphoff, "Development of Technology to Support the Construction of Robotic Mechanisms in SLA Machines". Part of a "Special Session on Rapid Prototyping of Mechanisms and Robotic Systems" at the 26th ASME Biennial Mechanisms Conference, Paper Number DETC00/MECH-14207, Baltimore, MD, Sept 2000.
- [C18] B. Geving, A. Kataria, C. Moore, I. Ebert-Uphoff, T. Kurfess, D. Rosen, "Conceptual Design of a Generalized Stereolithography Machine", '2000 Japan-USA Symposium on Flexible Automation', paper # 2000JUSFA-13172, Ann Arbor, MI, July 23-26, 2000.
- [C19] C.M. Gosselin, J. Wang, T. Laliberté, I. Ebert-Uphoff, "On the Design of a Statically Balanced 6-DOF Parallel Manipulator", the Tenth World Congress on the Theory of Machines and Mechanisms, Oulu, Finland, pp. 1045-1050, June 1999.
- [C20] I. Ebert-Uphoff, C.M. Gosselin, "Dynamic Modeling of a Class of Spatial Statically-Balanced Parallel Platform Mechanisms", *1999 IEEE International Conference on Robotics and Automation*, vol. 2, pp. 881-888, Detroit, MI, May 1999.
- [C21] I. Ebert-Uphoff, C.M. Gosselin, and T. Laliberté, "Static Balancing of a Class of Spatial Parallel Platform Mechanisms", *1998 ASME Design Engineering Technical Conferences*, DETC/MECH-5964, Atlanta, GA, Sept 1998.
- [C22] I. Ebert-Uphoff, C.M. Gosselin, "Kinematic Study of a new Type of Spatial Parallel Platform Mechanism", *1998 ASME Design Engineering Technical Conferences*, DETC/MECH-5962, Atlanta, GA, Sept 1998.
- [C23] G. Chirikjian and I. Ebert-Uphoff, "Discretely Actuated Manipulator Workspace Generation Using Numerical Convolution on the Euclidean Group", vol. 1, pp. 742-749, *IEEE Conference on Robotics and Automation*, Leuven, Belgium, May 1998.
- [C24] I. Ebert-Uphoff and G. Chirikjian, "Discretely Actuated Manipulator Workspace Generation by Closed-Form Convolution", *ASME Mechanisms Conference*, 96-DETC/MECH-1162, Irvine, CA, August 1996.

- [C25] I. Ebert-Uphoff and G. Chirikjian, “Inverse Kinematics of Discretely Actuated Hyper-Redundant Manipulators Using Workspace Densities”, *IEEE Conference on Robotics and Automation*, pp. 139-145, Minneapolis, Minnesota, April 1996.
- [C26] I. Ebert-Uphoff and G. Chirikjian, “Generation of Binary Manipulator Workspaces and Work Envelopes”, *Proceedings of the Third IASTED International Conference on Robotics and Manufacturing*, pp. 14-20, Cancun, Mexico, June 1995.

D. Non-Refereed Conference Publications

- [C27] I. Ebert-Uphoff, Y. Deng, ”A new type of climate network based on causal discovery methods”, *Frontiers in Computational Physics: Modeling the Earth System*, Dec 16 - 20, 2012, Boulder, CO, USA.
- [C28] A.T. Riechel, P. Bosscher, H. Lipkin, I. Ebert-Uphoff, “Concept Paper: Cable-Driven Robots for Use in Hazardous Environments”, *10th International Conference on Robotics & Remote Systems for Hazardous Environments*, Florida, March 2004.
- [C29] Jarek Rossignac, Mark Allen, Wayne J. Book, Ari Glezer, Imme Ebert-Uphoff, Chris Shaw, David Rosen, Stephen Askins, Jing Bai, Paul Bosscher, Joshua Gargus, ByungMoon Kim, Ignacio Llamas, Austina Nguyen, Guang Yuan, Haihong Zhu, “Finger Sculpting with Digital Clay: 3D Shape Input and Output through a Computer-Controlled Real Surface”, *Proceedings of the Shape Modeling International Conference*, Seoul, Korea, May 12-16, 2003.
- [C30] I. Ebert-Uphoff, J.-K. Lee, H. Lipkin, “Characteristic Tetrahedron of Wrench Singularities for Parallel Manipulators with Three Legs”, presented at *Ball 2000 Symposium*, Cambridge, GB, July 2000.

E. Technical Reports

- [R1] I. Ebert-Uphoff, Y. Deng, “Causal Discovery Methods for Climate Networks”, Technical Report, Georgia Tech, School of Mechanical Engineering, GT-ME-2010-001, December 2010.
- [R2] I. Ebert-Uphoff, “A Probability-Based Approach to Soft Discretization for Bayesian Networks”, Technical Report, Georgia Tech, School of Mechanical Engineering, GT-ME-2009-002, September 2009.
- [R3] I. Ebert-Uphoff, “Tutorial on How to Measure Link Strengths in Discrete Bayesian Networks”, Technical Report, Georgia Tech, School of Mechanical Engineering, GT-ME-2009-001, September 2009.
- [R4] Sebastien J. Wolff, Imme Ebert-Uphoff, Harvey Lipkin, “Statically Stable Assembly Sequence Generation for Many Identical Assembly Blocks”, Technical Report, Georgia Tech, College of Computing, GIT-IC-07-06, October 2007.
- [R5] I. Ebert-Uphoff, “Measuring Connection Strengths and Link Strengths in Discrete Bayesian Networks”, Technical Report, Georgia Tech, College of Computing, GT-IIC-07-01, January 2007.

F. Refereed Conference Video

- [V1] I. Ebert-Uphoff, A.X.H. Dang, R.W. Bush, “The Theoretical and Experimental Development of an Active Acceleration Compensation Platform for the Transport of Delicate Objects”, **Video Proceedings** of the *2004 IEEE International Conference on Robotics and Automation*, New Orleans, LA, April 26 - May 1, 2004.

G. Software

- Developed 3 Extension Packages for BNT (Bayes Net Toolbox):

1. Soft Discretization Package (last updated Nov 2009):
Implements soft discretization for training and inference in Bayesian Networks.
2. LinkStrength Package (last updated Feb 2007):
Calculates and vizualizes link strengths and connection strengths in discrete Bayesian Networks.
3. MarkovEquivalent Package (last updated Feb 2007):
Generates all DAGs represented by a pattern (partially oriented DAG), and all DAGs that are Markov equivalent to a DAG.

BNT source code and User Guides are avaiable at www.DataOnStage.com.

- Member of Development Team of Intel’s Open-Source Probabilistic Networks Library (PNL) since Oct. 2005.
- Developed 2 Extension Packages for PNL (Probabilistic Network Library):
 1. PNLtoGraphviz Interface (last updated Mar 2006):
Generates graph representations for PNL networks of type BayesNet, DBN or LIMID in the dot-language, thus acting as interface to Graphviz (Open-Source Graph Vizualization Software).
 2. LinkConnectionStrength Package (last updated Mar 2006):
same functionality as LinkConnectionStrength Package for BNT above.

PNL source code and User Guides are avaiable at www.DataOnStage.com.

H. Patents

- United States Letters Patent No. 6,836,736 (issued Dec 28, 2004).
Inventors: Mark Allen, Wayne Book, Imme Ebert-Uphoff, Ari Glezer, David Rosen, Joroslaw Rossignac.
Title: “Digital Clay Apparatus and Method”.

V. TEACHING EXPERIENCE

A. Graduate Courses Taught (1998-2004)

- ME 6407 Robotics
- ME 8843 Nonserial Robotics

B. Undergraduate Courses Taught (1998-2004)

- ME 3115 System Dynamics
- ME 4445 Automatic Control
- ME 4450/4451 Robotics
- ME 2110 Creative Decisions and Design (Lab Sections)
- ME 4055 Experimental Engineering (Lab Sections)

C. Teaching Quality – Instruction Opinion Surveys

Consistently received excellent scores on mandatory instruction opinion surveys – generally 4.5 or higher on a score of up to 5.0 (best score). Scores available upon request.

D. New Course Development

- Created a **new graduate level course, ME 8843 Nonserial Robotics** (Fall 2002).
- Created a **new undergraduate level course, ME 4450/4451 Robotics** (Spring 2000), in collaboration with colleague Dr. Harvey Lipkin.
- Created the “Robotics Center for Teaching” which makes several types of robots available to graduate and undergraduate students for classes and independent research projects.
- Developed a set of laboratory experiments for use in undergraduate robotics courses. About half of the experiments deal with *parallel manipulators*, which is believed to be the first time that experiments on parallel manipulators are integrated in any undergraduate curriculum in the US.
- Co-founder and Primary Faculty Advisor of the Georgia Tech Robotics Club (1999-2004).

VI. STUDENTS ADVISED

A. Ph.D. Students

1. SEBASTIEN WOLFF, “Statically Stable Assembly Sequence Generation And Structure Optimization For A Large Number Of Identical Building Blocks”. Co-supervised by Harvey Lipkin. July 2006.
2. PAUL BOSSCHER, “Disturbance Robustness Measures and Wrench-Feasible Workspace Generation Techniques for Cable-Driven Robots”. December 2004.
3. PHILIP VOGLEWEDE, “Measuring Closeness to Singularities of Parallel Manipulators with Application to Design of Redundant Actuation”. May 2004.
4. KRISTOPHER KOZAK, “Robust Command Generation for Nonlinear Systems”. Co-supervised by William Singhose. May 2003.
5. ANH DANG, “Theoretical and Experimental Development of an Active Acceleration Compensation Platform Manipulator for Transport of Delicate Objects”. November 2002.

B. M.S. Students

1. ANDREW RIECHEL, “Force-Feasible Workspace Analysis and Motor Mount Disturbance Compensation for Point-Mass Cable Robots”. Spring 2004.
2. LALE KORKMAZ, “Optimization of Muscle Coordination in Cat Hindlimb”. Co-supervised. Primary advisor: Lena Ting (BME). Spring 2004.
3. PAUL BOSSCHER, “Digital Clay – Architecture Designs for Shape-Generating Mechanisms”. April 2003.
4. KRISTOPHER KOZAK, “Dynamic Analysis of Parallel Manipulators and Digital Input Shaper Computation Using Linear Optimization”. Co-supervised by William Singhose. September 2001.
5. ROBERT BUSH, “Design of an Active Acceleration Compensation Robot”. July 2001.
6. JACOB DIEZ, “Design for Additive Fabrication: Building Miniature Robotic Mechanisms”. March 2001.

7. VINCENT CHAN, “Singularity Analysis and Redundant Actuation of Parallel Manipulators”. March 2001.
8. MICHAEL DECKER, “Active Acceleration Compensation for Transport of Delicate Objects”, August 2000.
9. BRADLEY GEVING, “Enhancement of Stereolithography Technology to Support Building Around Inserts”, April 2000.
10. KEVIN JOHNSON, “Development of a Statically Balanced Parallel Platform Manipulator”, January 2000.

C. Undergraduate Students

Involved 20 undergraduate students in research either as paid research assistants or through Special Problems Course.

VII. SERVICE

A. Professional Contributions

- Contributor to Bayes Net Toolbox for Matlab. Author of three new software packages for BNT (2007-2010).
- Member of Development Team of Intel’s Open Source Probabilistic Network Library (PNL) effective Oct 2005. Author of two new software packages for PNL.
- Program Committee Member of 2004 ASME Mechanisms Conference. Chair of Robotics Theory Symposium at that conference.
- Elected Member of ASME Mechanism Committee (2002-2004). Chair of Robotics Subcommittee.
- Organized a 2-Day, NSF-funded Workshop on “Fundamental Issues and Future Research Directions for Parallel Mechanisms and Manipulators”, Québec City, Canada, October 3-4, 2002.
- Program Committee Member of the 2002 IEEE International Conference on Robotics and Automation, May 2002, Washington, D.C.
- Program Committee Member of the 2001 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM’01), July 8-11, 2001, Villa Olmo, Como, Italy.
- Served on several NSF Review panels for the following programs:
 - Dynamic Systems and Controls Program,
 - Manufacturing Machines and Equipment Program,
 - Robotics.
- Organized a “Special Session on Rapid Prototyping of Mechanisms and Robotic Systems” at the 26th ASME Biennial Mechanisms Conference, (ASME Design Technical Conferences, Baltimore, MD, September, 2000).
- Organized a conference-wide Round Table on the “Infrastructure for Mechatronics Education”, 1999 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM’99), Atlanta, GA Sept 1999.
- Organized two invited sessions on “Teaching Mechatronics”, 1999 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM’99), Atlanta, GA Sept 1999.

B. Campus Contribution Highlights

- Spearheaded Robotics Initiative on GT campus (2003-2004). Organized two workshops (Fall '03: 1 day. Spring '04: 2 days). **This initiative was the precursor for the creation of the interdisciplinary “Center for Robotics and Intelligent Machines” and of the “Ph.D. program in Robotics” at Georgia Tech.**
- Primary Faculty Advisor of the Robotics Club (1999-2004).
- Member of Dean’s Faculty Advisory Committee (Spring 2003 - Summer 2004).
- Elected Member of Academic Senate and General Faculty Assembly (2002-2005).
- Member of Undergraduate Committee (in 1999-2000), Graduate Committee (2000-2001) and Instructional Laboratory Committee (2001-2004).
- Academic course advisor for students in exchange program with the Technical University Munich (TUM), Germany (Fall 2002-Summer 2004).

VIII. GRANTS AND CONTRACTS

A. As Principal or Co-Principal Investigator

- Georgia Tech - Focused Research Proposal in Robotics
PI: Tucker Balch (CoC) Co-PIs: Imme Ebert-Uphoff, Frank Dellaert (CoC), Magnus Egerstedt (ECE).
\$30,000. Awarded August 2004.
- Georgia Tech - Focused Research Proposal in Robotics
PI: Imme Ebert-Uphoff. Co-PIs: Tucker Balch (CoC), Frank Dellaert (CoC), Magnus Egerstedt (ECE).
\$30,000. Awarded August 2003.
- NSF - Workshop Proposal, Program for Manufacturing Machines & Equipment
Imme Ebert-Uphoff, “Workshop Proposal on Fundamental Issues and Future Research Directions for Parallel Mechanisms and Manipulators”
\$14,510. Awarded. Feb 2002.
- NSF – Information Technology Research Initiative.
PI: Wayne Book.
5 Co-PIs: Mark Allen, Imme Ebert-Uphoff, Ari Glezer, Jarek Rossignac, David Rosen.
Funds 1 graduate student and 1 month of summer salary for Ebert-Uphoff.
“ITR/PE+SY Digital Clay for Shape Input and Display,” September 2001 - September 2006.
\$2,000,000. Awarded September 2001.
- NSF CAREER Proposal.
Imme Ebert-Uphoff, “CAREER: New Research Directions for Parallel Manipulators – Investigation of Redundant Actuation, Redundant Sensing and Static Balancing”, July 2000-June 2004.
\$200,000. Awarded June 2000.
- NSF REU Supplements to CAREER proposal (2001,2002,2003). **\$24,000.**
- Technology Fee Proposals:
 - Imme Ebert-Uphoff, “Robotics Teaching Center”.
\$66,000. Awarded December 2001.
 - Imme Ebert-Uphoff and Harvey Lipkin, “Creation of a Robotics Laboratory Center”.
\$26,000. Awarded October 1999.

- Wayne Book and Imme Ebert-Uphoff, “Virtual Access to a Real Laboratory in Systems Dynamics and Controls Via the Internet”.
\$28,400. Awarded October 1999.