

Curriculum Vitae: J. Edward Colgate

Appointments

Northwestern University

Co-Director (with Donald A. Norman), Segal Design Institute, 3/07-present

Pentair-Nugent Teaching Professor, 9/06-8/09

Professor and Director, Institute for Design Engineering and Applications (IDEA), 9/02-8/07

Alumnae of Northwestern Professor of Teaching Excellence, 9/03-9/06

Associate Professor, 9/94-8/02

Assistant Professor, 9/88-9/94

Gwangju Institute of Science and Technology

Adjunct Professor, 10/07-present

Education

Massachusetts Institute of Technology	Mechanical Engineering	Ph.D.	1988
Massachusetts Institute of Technology	Mechanical Engineering	S.M.	1986
Massachusetts Institute of Technology	Physics	S.B.	1983

Selected Honors

- Best Demonstration Award, 2007 World Haptics Conference, Tsukuba, Japan. For TPaD: Tactile Pattern Display, by Laura Winfield, J. Edward Colgate and Michael Peshkin.
- Emerald Literati Network Awards for Excellence 2007, “Highly Commended” citation for “Lessons Learned from a Novel Teleoperation Testbed” by B.P. Dejong, E.L. Faulring, J.E. Colgate, M.A. Peshkin, H. Kang, Y.S. Park, T.F. Ewing, *Industrial Robot*, 33(3): 187-193, 2006
- Visiting Professor, Institut d’Organització i Control de Sistemes Industrials, Universitat Politècnica de Catalunya, April 2006
- Leonardo Da Vinci Award for Contributing Significantly to Design Engineering, 2003. Presented by Design Engineering Division of the American Society of Mechanical Engineers.
- Freshman Programs Division (FPD) 2002 Best Paper Award for paper “Enriching Freshman Design Through Collaboration With Professional Designers” by P. Hirsch, J. Anderson, J.E. Colgate, J. Lake, B. Shwom, and C. Yarnoff.
- Northwestern University Alumni Association Excellence in Teaching Award, 2000
- 1998 ASME Material Handling Engineering Division Best Paper Award for paper “Cobots: A Novel Material Handling Technology” by Wannasuphprasit, W., Akella, P., Peshkin, M., Colgate, J.E.
- Finalist, Discover Magazine Awards for Technological Innovation, 1997 (with M.A. Peshkin)
- Best Paper Award, 1996 IEEE International Conference on Robotics and Automation for paper “Nonholonomic Haptic Display” by J. Edward Colgate, M.A. Peshkin and W. Wannasuphprasit

Selected Publications

A Framework for the Simulation and Haptic Display of Dynamic Systems Subject to Holonomic Constraints

Adolfo Rodriguez, Luis Basanez, J. Edward Colgate, and Eric L. Faulring

International Journal of Robotics Research – in press

Using Kinesthetic and Tactile Cues to Maintain Exercise Intensity

Aaron Ferber, Michael A. Peshkin and J. Edward Colgate

IEEE Transactions on Haptics – in press

On the Design of Miniature Haptic Devices for Upper Extremity Prosthetics

Keehoon Kim, J. Edward Colgate, Julio J. Santos-Munné, Alex Makhlin, Michael A. Peshkin

IEEE-ASME Transactions on Mechatronics – in press

- Investigation of Motion Guidance with Scooter Cobot and Collaborative Learning*
Boy, E.S., Burdet, E., Teo, C.L. and Colgate, J.E.
IEEE Transactions on Robotics, 23(2):245-255, April 2007.
- Power Efficiency of the Rotational-to-Linear Infinitely Variable Cobot Transmission*
Eric L. Faulring, J. Edward Colgate, and Michael A. Peshkin
ASME Journal of Mechanical Design, 129(12):1295-1293, December 2007.
- Haptic display of constrained dynamic systems via admittance displays*
Faulring, E.L., Lynch, K.M., Colgate, J.E., Peshkin, M.A..
IEEE Transactions on Robotics, 23(1):101-111, February 2007
- The cobotic hand controller: design, control and performance of a novel haptic display*
Faulring, E.L., Colgate, J.E., Peshkin, M.A.
International Journal of Robotics Research, 25(11): 1099-1119, November 2006.
- Creating the Foundation for an Engineering Design Education*
Ann McKenna, J. Edward Colgate, Steven Carr and Gregory Olson
International Journal of Engineering Education, 22(3), 2006
- Lessons Learned from a Novel Teleoperation Testbed*
Brian P. Dejong, Eric L. Faulring, J. Edward Colgate, Michael A. Peshkin, Hyosig Kang, Young S. Park,
Thomas F. Ewing
Industrial Robot, 33(3): 187-193, 2006
- Controlling the Apparent Inertia of Passive Human-Interactive Robots*
Tom Worsnopp, Michael Peshkin, Kevin Lynch and J. Edward Colgate
Journal of Dynamics Systems, Measurement and Control, 128(1): 44-52, March 2006
- Static Single-Arm Force Generation With Kinematic Constraints*
Peng Pan, Michael A. Peshkin, J. Edward Colgate, and Kevin M. Lynch
J Neurophysiol, May 2005; 93: 2752 - 2765.
- Mechanics and Control of Swimming: A Review*
J. Edward Colgate and Kevin M. Lynch
IEEE Journal of Oceanic Engineering, 29(3), pp. 660-673, 2004
- On the Role of Dissipation in Haptic Systems*
Brian E. Miller, J. Edward Colgate, Randy A. Freeman
IEEE Transactions on Robotics and Automation, 20(4), pp. 768-771, August 2004
- Cobot Implementation of Virtual Paths and 3-D Virtual Surfaces*
Carl. A. Moore, Jr., M.A. Peshkin and J.E. Colgate
IEEE Transactions on Robotics and Automation, 19(2), pp. 347-350, April 2003
- Passivity of a Class of Sampled-Data Systems: Application to Haptic Interfaces*
J. Edward Colgate and Gerd G. Schenkel
Journal of Robotic Systems, 14(1):37-47, 1997
- Real-time Impulse-based Simulation of Rigid Body Systems for Haptic Display*
Beeling Chang, J. Edward Colgate, Northwestern University
Proceedings of the ASME Dynamic Systems and Control Division, DSC-Vol. 61, 145-152, 1997
- Collaborating with Design Professionals and Industry to Build a Design Course for Freshmen*
Penny Hirsch, Barbara Shwom, John Anderson, J. Edward Colgate, Dave Kelso, Steve Jacobson, Charly
Yarnoff and John Lake
International Journal of Engineering Education, 19(1), January 2003.
- Robust Impedance Shaping Telemanipulation*
J. Edward Colgate

IEEE Transactions on Robotics and Automation, 9(4):374-384, August 1993
Minimum Mass for Haptic Display Simulations
J. Michael Brown and J. Edward Colgate
Proceedings of the ASME Dynamic Systems and Control Division, 1998
Passive Implementation of Multibody Simulations for Haptic Display
J. Michael Brown, J. Edward Colgate, Northwestern University
Proceedings of the ASME Dynamic Systems and Control Division, DSC-Vol. 61, 85-92, 1997
Effects of Non-Uniform Environment Damping on Haptic Perception and Performance of Aimed Movements
Paul A. Millman and J. Edward Colgate
Proceedings of the ASME Dynamic Systems and Control Division, vol. 2 DSC-Vol. 57-2, 703-712, 1995

Other Activities

Curriculum Development: Segal Design Institute

I am the co-director (with Donald A. Norman) of the **Segal Design Institute** (www.segal.northwestern.edu) which focuses on the study of “design in context.” We are interested teaching design thinking to students who have a disciplinary focus such as engineering or management, but who wish to work in cross-disciplinary, highly innovative settings. As part of the Segal Design Institute, Don and I co-direct a new (as of fall 2007) Master of Science program in **Engineering Design and Innovation** (EDI). EDI takes young engineering graduates and introduces them to topics like interaction design, experience design, and service design. Segal and EDI build on two earlier efforts of mine, the **Institute for Design Engineering and Applications** (IDEA), and an ambitious freshman program called “**Engineering Design and Communication**” (EDC). IDEA, a name that has now been replaced by Segal, focuses on design throughout the undergraduate curriculum. It includes a variety of courses, a stand-alone Bachelor’s degree, and a Design Certificate that can be earned by any engineering student. EDC is a required part of the engineering curriculum at Northwestern and is taken by nearly 400 students annually. EDC introduces students to a customer-oriented process of engineering design, and it teaches design and technical communication in a highly integrated fashion. Since 2005, IDEA and EDC have occupied the newly constructed Ford Motor Company Engineering Design Center.

Commercialization: Cobotics, Inc. and Kinea Design, LLC

I have a strong interest in product development. In 1997 my colleague Michael Peshkin and I formed a company to develop commercially viable products in the area of cobotics and related “Intelligent Assist Devices”. I took a leave during the 99-00 academic year to jump-start this company. Cobotics Inc., now under the ownership of The Stanley Works, provides Intelligent Assist Devices to the industrial marketplace. In 2003 Prof. Peshkin and I, along with colleague David Brown, co-founded Kinea Design, which develops robotic and mechatronic technologies for physical rehabilitation.

Board Membership

I am a member of the Board of Directors of Methode Electronics, Inc. (NASDAQ: METH). Methode designs, manufactures, and markets component devices and subsystems world-wide for Original Equipment Manufacturers (OEMs) of information processing and networking equipment, voice and data communications systems, consumer electronics, automobiles, aerospace vehicles and industrial equipment. Products employ electrical, electronic, and optoelectronic technologies such as sensors, interconnects, and controls.

Service to the Haptics Community

In 1993 my colleague Bernard Dov Adelstein and I organized the first “Symposium on Haptic Interfaces to Virtual Environments and Teleoperators” at the ASME’s Winter Annual Meeting. This symposium is now the premier conference in the haptics field. My laboratory hosts the *Haptics Community Web Page*. I was a Program Committee Chairman for World Haptics 2005, the first ever global haptics conference, and I am the founding Editor-in-Chief of the IEEE Transactions on Haptics (since 10/07).