

# Dan Nathan-Roberts, Ph.D.

*Assistant Professor, Department of Industrial & Systems Engineering*

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## EDUCATION

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- June 2014     **UNIVERSITY OF WISCOMSIN-MADISON**, Madison, WI  
**Agency for Healthcare Research and Quality Postdoctoral Fellow**  
*Advisors:* Dr. Pascale Carayon, Patricia Flatley Brennan
- March 2012    **UNIVERSITY OF MICHIGAN**, Ann Arbor, MI  
**Ph.D., Industrial and Operations Engineering**  
*Using Interactive Genetic Algorithms to Support Aesthetic Ergonomic Design*  
*Advisor:* Dr. Yili Liu
- May 2009     M.S.E, Industrial and Operations Engineering
- May 2006     **UNIVERSITY OF ROCHESTER**, Rochester, NY  
Bachelor of Science, Mechanical Engineering  
Fellowship in Cognitive Science and Communication

## REFEREED JOURNAL PUBLICATIONS

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1. **Nathan-Roberts, D.**, Liu, Y. "Testing Aesthetic and Function Design Preference for Touch Screen and Non-Touch Screen Mobile Phones Using Interactive Genetic Algorithms" *International Journal of Human Computer Interaction*, Provisionally accepted
2. Kantowitz, B. H., & **Nathan-Roberts, D.** "[Sources of Stimulus-Response Compatibility: Frames, Rules, and Response Tendencies](#)" (2009), *Ergonomics Open Journal*, 2, 163-169.
3. Rempel, D., **Nathan-Roberts, D.**, Chen, B.Y., Odell, D. "[The Effects Of Split Keyboard Geometry on Upper Body Postures](#)" (2009), *Ergonomics*, 52:1, 104-111.

## REFEREED CONFERENCE PUBLICATIONS

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1. Valdez, R., Holden, R. J., Hundt, A., Marquard, J., Montague, E., **Nathan-Roberts, D.**, Or, C., "The Work and Work Systems of Patients: A New Frontier for Macroergonomics in Health Care." Panel presented at *the HFES 58<sup>th</sup> Annual Meeting*, Chicago, IL
2. **Nathan-Roberts, D.**, Brennan, P.F., "[Patient Affective System Design: Informatics Aspects of Engaging Care](#)." Poster at AMIA 2013 Annual Symposium, 2013
3. **Nathan-Roberts, D.**, Liu, Y., "[Comparison of Design Preferences for Mobile Phones and Blood Glucose Meters](#)." Proceedings of HFES 56<sup>th</sup> Annual Meeting, 2012

4. **Nathan-Roberts, D.**, Kelley, J., Liu, Y., "[Integrating Aesthetic and Usability Factors in the Design of Mobile Phones.](#)" Proceedings of HFES 56<sup>th</sup> Annual Meeting, 2012
5. **Nathan-Roberts, D.**, Kelley, J., Liu, Y., "[Determining the Effect of Users' Mobile phone on Design Preference via Interactive Genetic Algorithms.](#)" Proceedings of HFES 55<sup>th</sup> Annual Meeting, 2011
6. **Nathan-Roberts, D.**, Liu, Y., "[Investigation of Relative Mobile Phone Size Preference Using Interactive Genetic Algorithms.](#)" Proceedings of HFES 54<sup>th</sup> Annual Meeting, 2010
7. **Nathan-Roberts, D.**, Liu, Y., Young, Michael, Hays, Jon D., So, Christine An, Little, Christian, and Zhao, Liang Hao. "[Content Analysis of Literature on Mobile Phone Design Features.](#)" IEA, 17th World Congress on Ergonomics, 2009, Beijing, China.
8. **Nathan-Roberts, D.**, B. Chen, G. Gscheidle, and D. Rempel. "[Comparisons of Seated Postures between Office Tasks.](#)" Proceedings of HFES 52nd Annual Meeting, 2008.

#### **BOOK CHAPTERS**

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1. DeGraff, J., **Nathan-Roberts, D.** (2011). [Innovativeness as Positive Deviance: Identifying and Operationalizing the Attributes, Functions and Dynamics that Create Growth.](#) In K. S. Cameron & G. M. Spreitzer (Eds.) Oxford Handbook of Positive Organizational Scholarship, The. New York: Oxford University Press.

#### **ACADEMIC CONFERENCE PAPERS & PRESENTATIONS (Invited)**

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1. **Nathan-Roberts, D.**, et al. (2014, October). "Enabling Interdisciplinary Research: Insights for Facilitating Collaboration & Creating Multidisciplinary Research Opportunities" Panel presented at *the HFES 58<sup>th</sup> Annual Meeting*, Chicago, IL
2. **Nathan-Roberts, D.**, et al. (2013, September). "Transitioning From Service to Outreach: Leveraging Skills and Lessons Learned from Student Activities to the Working World" Panel presented at *the HFES 57<sup>th</sup> Annual Meeting*, San Diego, CA
3. **Nathan-Roberts, D.** (2012, October). Using Interactive Genetic Algorithms to Support Aesthetic Ergonomic. *ISyE Colloquium, University of Wisconsin-Madison.* (invited lecture)
4. **Nathan-Roberts, D.**, et al. (2010, May). "Engineering Safer Systems" Panel presented at the [Safety by Design: Innovative Approaches to for Safe Injections workshop](#), Center for Disease Control and Prevention (CDC), Atlanta, GA
5. **Nathan-Roberts, D.**, et al. (2010, May). "Assisted Blood Glucose Monitoring: Towards Safety" Panel presented at the [Sticking with Safety: Eliminating Bloodborne Pathogen Risks during Blood Glucose Monitoring workshop](#), Center for Disease Control and Prevention (CDC), Atlanta, GA
6. **Nathan-Roberts, D.**, Beeker, Alex, Liu, Yili. (2009, November). [Modeling Two Key Physical Ergonomic Problems with Mobile Phones.](#) University of Michigan Engineering Graduate Symposium.

7. Kantowitz, B. H., **Nathan-Roberts, D.** (2009, October). Research Styles, Control-Display Compatibility, and Satisfactory Engineering Models. (invited lecture) *IOE 836: Ergonomics Seminar.*
8. **Nathan-Roberts, D.** (2009, September). Content Analysis of Literature on Mobile Phone Design Features. *IOE 836: Ergonomics Seminar, University of Michigan.* (invited lecture)
9. **Nathan-Roberts, D.** (2009, August). Human Factors Model for Home Use Medical Devices. *Food and Drug Administration, Center for Device and Radiological Health, Office of Science and Engineering Laboratories.* (invited lecture)
10. **Nathan-Roberts, D.**, Jetley, R., Weininger, S. (2009, July). Human Factors Model for Home Use Medical Devices. *Student Fellow Poster Presentation, Food and Drug Administration, Center for Device and Radiological Health, Office of Science and Engineering Laboratories.* (invited poster)
11. Young, M., Hays, J., So, C., Little, C. Zhao, J., **Nathan-Roberts, D.**, Liu, Y. (2009, April). Content Analysis of Literature on Mobile Phone Design Features. (poster) *Undergraduate Research Symposium.*
12. **Nathan-Roberts, D.** (2007, October). Full Body Kinematics in Seating. (invited lecture) *IOE 836: Ergonomics Seminar.*

#### **WORKS UNDER REVIEW**

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1. **Nathan-Roberts, D.**, Brennan, Y. "Testing Aesthetic and Function Design Preference for Touch Screen and Non-Touch Screen Mobile Phones Using Interactive Genetic Algorithms" *International Journal of Human Computer Interaction*, Provisionally accepted
2. **Nathan-Roberts, D.**, Liu, Y. "Testing Aesthetic and Function Design Preference for Touch Screen and Non-Touch Screen Mobile Phones Using Interactive Genetic Algorithms" *International Journal of Human Computer Interaction*, Provisionally accepted

#### **WORKING PAPERS**

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1. **Nathan-Roberts, D.**, Brennan, P.F., Hoonakker, P., Carayon, P., "vizHOME Human Factors Assessment Protocol and Early Results." Article in progress
2. Hoonakker, P., **Nathan-Roberts, D.**, Hundt, A., Carayon, P., "Challenges of Human Factors Field Research with Patients who have Complex Illnesses." Article in progress
3. Hoonakker, P., **Nathan-Roberts, D.**, Hundt, A., Carayon, P., "Patient Perceptions of Case Management." Article in progress
4. **Nathan-Roberts, D.**, Liu, Y. "Comparison of Design Preferences for Mobile Phones and Blood Glucose Meters for Experienced and Non-user Groups." Article in progress

5. **Nathan-Roberts, D.**, Liu, Y. "Combining Interactive Genetic Algorithms and Traditional Genetic Algorithms to Simultaneously Determine Aesthetic Preference and Improve Usability of Mobile Phones and Blood Glucose Meters." Article in progress

## **INSTRUCTIONAL MATERIALS**

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1. Kantowitz, B., **Nathan-Roberts, D.** (2010). Course Pack II in B. Kantowitz, (Ed.), *IOE 334: Ergonomics Laboratory*, University of Michigan, Ann Arbor, MI, Dollar-Bill Copying.
2. **Nathan-Roberts, D.**, Waxman, C., Madden, N. (2005). Iglesia Engineering Academy Manual in K. Iglesia, (Ed.), *Iglesia Engineering Academy, Summer 2005*, Rochester City School, Rochester, NY.

## **GRANTS & FELLOWSHIPS**

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- UNIVERSITY OF WISCONSIN-MADISON**, Madison, WI
- 2013-Present R01 Investigator, Agency for Healthcare Research and Quality  
Total award of \$2.5M for 5 years; *R01: vizHOME: A context-based health information needs assessment strategy*, with Principal Investigator Patricia Brennan, and Co-Investigator Kevin Ponto, Pascale Carayon, and others.
- 2012-Present Postdoctoral Fellowship, Agency for Healthcare Research and Quality

- UNIVERSITY OF MICHIGAN**, Ann Arbor, MI
- 2007-2012 Departmental Fellowship, Industrial and Operations Engineering
- 2007-2012 Tauber Fellow, Tauber Institute for Global Operations
- 2011 Conference Travel Grant, Rackham Graduate School
- 2010 Conference Travel Grant, Rackham Graduate School
- 2009 International Conference Travel Grant, Rackham Graduate School
- 2008 Conference Travel Grant, Rackham Graduate School

- AMERICAN SOCIETY OF MECHANICAL ENGINEERS**
- 2007 **Nathan-Roberts, D.**, Schulte, L. , ASME Development Fund Grant  
\$30,000 award; Establishing a Robust Student District Operating Board in Every District

- UNIVERSITY OF ROCHESTER**
- 2004 - 2005 Fellowship, Cognitive Science and Social Psychology

## **RESEARCH AND INDUSTRY EXPERIENCE**

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- UNIVERSITY OF WISCONSIN-MADISON**, Madison, WI
- 2012-Present **Postdoctoral Fellow**, Agency for Healthcare Research and Quality  
Researching healthcare human factors, specifically patient work systems as an investigator on a \$2.5M R01 through AHRQ, and through existing grants at the Center for Quality and Productivity Improvement (CQPI), and the Living Environments Laboratory, part of the Wisconsin Institutes for Discovery.

- 2010-Present **COMPETING VALUES**, Ann Arbor, MI  
**Innovatrium Fellow& Consultant**  
Innovation consultant; submitted proposals to, developed innovation training programs for, and provided coaching to a number of companies including several fortune 500 companies up to the VP and CEO levels.
- 2010 **BAXTER INC.**, Round Lake, IL  
**Consultant**  
Provided focus group facilitation, and human factors recommendations.
- 2009 **FOOD AND DRUG ADMINISTRATION**, Washington, DC  
Summer **Human Factors Fellow**, Center for Device and Radiological Health  
*Oak Ridge Institute for Science and Education (ORISE)*  
Provided human factors feedback for device standards. Built a model of human factors design aspects that relates to home use medical devices.
- 2008 **INTEL CORPORATION**  
Summer **Digital Health Research Intern**, Portland, OR  
Created physical & cognitive ergonomic specifications for a first generation digital health tool. Generated initial physical designs and provided ergonomic training to technical team.
- 2008 **INTEL CORPORATION**  
Summer **Tauber Institute Team Project Intern**, Chandler, AZ  
Developed financial model, and pilot tested a new distribution network that will reduce customer inventory by \$24.5M, shorten lead time, and reduce Intel's cost by \$63+M per year.  
**3<sup>rd</sup> place**, Tauber *Spotlight!* project competition (\$9,000 prize)
- 2008 **HERMAN MILLER INC.**, Holland, MI  
**Consultant**  
Advised design team on cognitive ergonomic and mechanical engineering aspects of a new design concept.
- 2006 - 2007 **UNIVERSITY OF CALIFORNIA ERGONOMICS PROGRAM**  
**Engineering Researcher**, Richmond, CA  
Lead researcher on ergonomics studies for Herman Miller, Microsoft, and Logitech. Investigated computer mouse weight, keyboard design, and seating posture using Fitt's law tasks, typing tasks, and a 3D infrared optical marker system.
- 2006 **GLACIER BAY**, Oakland, CA  
**Mechanical Engineer**  
Used 3D CAD systems to design ultra high-efficiency air conditioning and heating systems, solicited customer requirements.

- 2004 & 2005  
(2 semesters) **UNIVERSITY OF ROCHESTER**, Rochester, NY  
**Independent Studies**, Brain and Cognitive Sciences  
Used eye-tracking system and performance testing to optimize the display of remote and recorded technical lectures to the deaf.
- 2004  
Summer **ALCOA FASTENING SYSTEMS**, Telford, England  
**Mechanical Engineering Intern**  
Planned in-house stainless steel and aluminum chemical coating plants, increasing quality and corrosion resistance while decreasing lead-time.
- 2003  
Summer **ALCOA FASTENING SYSTEMS**, Kingston, NY  
**Mechanical Engineering Intern**  
Implemented and supported Unigraphics 3D CAD software across engineering groups. Provided software customization and training.

## TEACHING

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- 2013 **UNIVERSITY OF WISCONSIN-MADISON**, Madison, WI  
**Research Supervisor:** Undergraduate Research Scholars program  
Volunteer mentor of second-year undergraduate leading to an analysis of patient disease history on patient knowledge.
- 2008-2012  
(8 semesters) **UNIVERSITY OF MICHIGAN**, Ann Arbor, MI  
**Graduate Student Instructor:** IOE 334, Ergonomics Laboratory  
Faculty Supervisor: Dr. Barry Kantowitz  
Led four of the six sections of an upper-level undergraduate ergonomics laboratory class, supervised two to four undergraduate graders per semester, developed coursepack improvements, worked with publisher, and held office hours.
- 2012 **Instructor:** Design science in entrepreneurship workshop  
Co-taught design science techniques for a workshop of non-native English speaking young entrepreneurs from the Middle East.
- 2012 **Instructor:** Seven (Simple) Strategies to Improve Your Teaching  
Invited to repeat, for a new audience, an interactive workshop on improving teaching based on Chickering & Gamson's 1987 paper on enhancing student learning.
- 2011 **Facilitator:** Advanced Practice Teaching Session  
Invited to co-facilitate practice teaching sessions for graduate student instructors based on active learning techniques.
- 2011 **Facilitator:** Engineering Graduate Student Instructor Orientation  
Co-facilitated training for engineering graduate student instructors.
- 2011 **Facilitator:** Instructional Aide Orientation  
Co-facilitated training for undergraduate aides of university lab courses.

- 2011 **Instructor:** Seven (Simple) Strategies to Improve Your Teaching  
Co-taught a highly-interactive workshop on improving teaching based on Chickering & Gamson's 1987 paper on enhancing student learning.
- 2009 **Research Supervisor:** One-on-one research project with an undergraduate student, leading to a conference proceeding on physical ergonomic aspects of mobile phones.
- 2008 - 2009 **Research Supervisor** for Undergraduate Research Opportunity (UROP)  
Led five engineering undergraduate students in year-long research project on mobile phone aesthetics resulting in a poster and conference proceeding.
- 2006 - 2007 **UNIVERSITY OF CALIFORNIA ERGONOMICS PROGRAM**  
**Engineering Researcher**  
Oversaw hiring, training, and mentoring undergraduate students and a recent graduate on several published research projects.
- 2005 - 2006 **CAPITAL NORMAL UNIVERSITY HIGH SCHOOL, Beijing, China**  
(*Shou Shi Da FuZhong*)  
**Instructor:** Upper-level English  
Planned and taught English curriculum to 500 high school students at a prestigious Beijing school. Coordinated hands-on engineering and English after-school program for high school students.
- 2005 **IGLESIA EDUCATION CENTER, Rochester, NY**  
**Program Director:** Engineering education  
Responsible for developing an entirely new engineering education program (teaching materials, budget, etc.), and teaching it to the instructors of a 150-student 3 week engineering academy for underprivileged adolescents.

#### **TRAINING FOR UNIVERSITY TEACHING**

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- 2013 **UNIVERSITY OF WISCONSIN-MADISON, Madison, WI**  
**Postdoctoral Fellowship, Agency for Healthcare Research and Quality**  
Received training in analysis of work systems and patient-centered informatics, including mixed methods research, and healthcare-specific research methods. Attended additional workshops & training programs.
- 2012 **UNIVERSITY OF MICHIGAN, Ann Arbor, MI**  
**U-M Graduate Teacher Certificate**  
Demonstrated professional development in six areas relating to teaching at the college level, including: exposure to new teaching strategies, in-classroom observation and coaching, mentorship from a faculty member, and syllabus preparation.

- 2011 **Rackham-CRLT Seminar: Preparing Future Faculty**  
A highly-selective, five-week intensive course covering topics related to university faculty work, instructional methods and technologies, research on teaching and learning, and diversity issues in the university academic setting.
- 2011 **NSF Workshop for Developing and Sustaining Productive Graduate Research Groups in Engineering, Virginia Tech**  
Highly interactive two-day workshop with engineering education researchers, deans, department heads, faculty, and graduate students covering topics including establishing a new research group, recruiting students, and issues of gender & race in STEM fields.
- 2009 **Quick and Easy Ways to Know Your Students Are Learning**  
Workshop on assessment techniques provided by the University of Michigan Center for Research on Learning and Teaching.
- 2008 **Active learning in the Sciences**  
Workshop on active learning techniques provided by the University of Michigan Center for Research on Learning and Teaching.

#### **ENTREPRENEURSHIP**

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- 2012 **UNIVERSITY OF MICHIGAN, Ann Arbor, MI**  
**Instructor:** Design science in entrepreneurship workshop  
Co-taught design science techniques for a workshop of non-native English speaking young entrepreneurs from the Middle East.
- 2006-2012 **TINT REMOVERS, Ann Arbor, MI**  
**President, Founder**  
Founded a profitable, environmentally-friendly car window tint removal business. Hired & trained staff, managed all business aspects.
- 2007 **ASME STUDENT PROFESSIONAL DEVELOPMENT CONFERENCE, Universidad Simon Bolivar, Caracas, Venezuela**  
**Plenary Address**  
Delivered Address to approximately 100 students on starting a business. Answered questions & facilitated discussion in English and Spanish.
- 2005 **UNIVERSITY OF ROCHESTER, Rochester, NY**  
**Awarded 2<sup>nd</sup> place, Charles and Janet Forbes contest**  
Part of a two-person team that developed a business plan to compete in the Charles and Janet Forbes business plan & VC presentation contest.
- 2005 **Kaufman Entrepreneurial Year Program Fellowship**  
One of the first two students ever offered (but I chose not to accept in order to pursue my engineering career) a University fellowship in entrepreneurship from the Kaufman Fund.



**AWARDS & HONORS**

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2010	Outstanding initiate, Epeians - University Engineering Honors Society
2008	3 <sup>rd</sup> Place, Tauber Institute for Global Operations <i>Spotlight!</i> Competition
2005	2 <sup>nd</sup> Place, Charles & Janet Forbes Entrepreneurial Award
2005	3 <sup>rd</sup> Place, University of Rochester, Isaac Davis/Chester Dewey public speaking contest
2004 - 2005	University fellowship in cognitive science and communication
2004	Helmut Weymann departmental prize for skill in engineering experimentation
2004	1 <sup>st</sup> Place, University of Rochester, Isaac Davis/Chester Dewey public speaking contest
2004 & 2005	Regional C.T. Main Award, the highest regional individual distinction awarded by ASME to a student member
2004	Simon Scholar Nominee, Simon School of Business
2003 & 2004	Paychex Leadership Institute Invitee
2003	"Most Innovative," University student section award, ASME
2003, 2004, & 2005	Dean's List award for academic achievement
2000 - 2004	Rush Rhees Scholarship for academic achievement

**CONFERENCES AND CONFERENCE SESSIONS ORGANIZED AND CHAIRED**

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2014	Session Chair, Healthcare track, HFES 58 <sup>th</sup> Annual Meeting
2013	Workshop participant, First I-PrACTISE Annual Meeting
2012	Session Co-Chair, Product Design track, HFES 56 <sup>th</sup> Annual Meeting
2011	Session Co-Chair, Product Design track, HFES 55 <sup>th</sup> Annual Meeting
2007-2011	Committee Member, ASME Student District Operating Board Organizing Committee
2008	Organizer, ASME Student District Operating Board Leaders Conference
2004 & 2005	Conference organizer and workshop leader Regional Student Conference, ASME
2003 & 2004	Workshop leader, Regional Student Leadership Seminar, ASME

**SERVICE ACTIVITIES (National & International)**

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2011-Present	Committee Member, Human Factors Engineering Committee, AAMI
2014-Present	Board member, Product Design Technical Group, HFES
2008-2013	Board member, Student and Early Career Engineer Representative to the Programs and Activities Board, ASME
2010-2012	Student Representative, Education Technical Group, HFES ( <i>two terms</i> )
2010-2012	Nominating Committee Member, ASME
2011	Selection committee member, HFES Product Design Technical Group User-Centered Product Design Award Committee (2011)
2010 & 2011	Organizer, Best Student Paper Award, HFES Education Technical Group
2010 & 2011	Reviewer, Journal of Diabetes Science and Technology
2010 & 2011	Volunteer, HFES Annual Meeting

- 2009 International student volunteer, IEA Conference, Beijing
- 2009 Committee member, National Ergonomics Month, HFES
- 2009 Reviewer, HFES Annual Meeting
- 2005 - 2007 Young Engineer Correspondent, ASME
- 2004 - 2006 Founding member, Committee on Student Development, ASME
- 2003 - 2004 Founder and chair, Regional Student Operating Board, ASME
- 2003 - 2004 Programs subcommittee chair and regional representative, Student Sections Committee, ASME

**SERVICE ACTIVITIES (Departmental, College, & University)**

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- 2014-Present Member, College of Engineering Graduate Studies Committee
- 2010 - 2012 Member, Epeians engineering leadership and service honors society
- 2009 - 2010 President, HFES Student Chapter at the University of Michigan
- 2008 - 2010 Student Volunteer, International Connect program
- 2009 & 2010 Student Volunteer, International Buddy program
- 2008 - 2009 President-Elect, HFES Student Chapter at the University of Michigan
- 2007 - 2008 Membership Chair, HFES Student Chapter at the University of Michigan
- 2008 Banquet Committee, Annual UM IOE Spring Banquet
- 2003 - 2004 Regional Student Conference Chair, ASME
- 2003 - 2004 Presidential Cabinet, Student Government