

# Ryan A. Beasley

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## **RESEARCH INTERESTS**

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Improve medical outcomes through robots, sensors, and control systems.  
Artificial intelligence via analog circuitry.

## **EDUCATION**

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Ph.D.	Harvard University	Engineering Sciences	August 2006
	Thesis: Model-Based Error Correction for Instrument Flexion in Robotic Surgery. Advisor: Professor Robert Howe		
S.M.	Harvard University	Engineering Sciences	June 2002
B.E.	Vanderbilt University	Biomedical Engineering	June 2000
B.E.	Vanderbilt University	Electrical Engineering	June 2000

## **EXPERIENCE**

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*Assistant Professor* August 2006-present  
Texas A&M University, Engineering Technology and Industrial Distribution

### **Research**

As the Engineering Technology programs are undergraduate only, my focus is on employing undergraduates for ongoing funded research projects.

- Undergraduates hired and advised:
  - Stephen Peck on development of an optotactile sensor. (2009)
  - Alexander Smith on development of an analog controller incorporating learning. (2009)
  - Rachell Dove on development of a linear stepper solenoid. (2008)
  - Andrew Roznovsky on development of an optotactile sensor. (2008)
  - Peggy Liska on development of an optotactile sensor. (2008)
  - Aaron Griggers on development of an MR-compatible cable-drive transmission. (2008)
- Co-hired and co-advised (with Dr Goulart) Shivananda Reddy on research and laboratory development of mesh networked mobile robots. (2008 - 2009)
- Advised creation of four pin tactile display where each pin moved independently in three dimensions. (Andrew Patrick and Clint Vigil, 2008)
- Advised creation of a hand-held device and database to plot efficient paths through grocery stores. (undergraduate capstone team, 2008)
- Advised development of an embedded controller for low-velocity, low-volume liquid flow (Brian Eaton and John Dockendorf, 2007)

## **Course and Educational Development**

- Developed new material for three separate courses:
  - *ENTC 210 Circuit Analysis I*: Developed and taught a course on DC analog circuits for sophomore level students.
  - *ENTC 219 Digital Circuits*: Developed and taught a course on digital circuits for sophomore level students.
  - *ENTC 489 Healthcare Technologies*: Developed and taught a course on the use, circuitry, and physics of devices used in hospitals for junior and senior level students.
- The following is a summary of student evaluations. Scores are based on a maximum of five points:

<b><u>Course Number</u></b>	<b><u>Course Name</u></b>	<b><u>Semester</u></b>	<b><u>Score (5.0)</u></b>
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Year 2008

ENTC 210	Analog Circuit I	Fall 2008	4.48
ENTC 489	Healthcare Technologies	Fall 2008	5.00
ENTC 210	Analog Circuits I	Spring 2008	4.16
ENTC 489	Healthcare Technologies	Spring 2008	4.70

Year 2007

ENTC 210	Analog Circuits I	Fall 2007	4.56
ENTC 489	Healthcare Technologies	Fall 2007	4.66
ENTC 210	Analog Circuits I	Spring 2007	4.43
ENTC 219	Electronic Devices and Circuits	Spring 2007	4.55

Year 2006

ENTC 210	Analog Circuits I	Fall 2006	4.47
ENTC 219	Electronic Devices and Circuits	Fall 2006	4.46

### *Research Assistant*

August 2000 - August 2006

Harvard University, Division of Engineering and Applied Sciences

Worked in the Biorobotics Laboratory for Dr Robert Howe. Responsible for improving precision and accuracy of surgical robots.

- Collaborated with surgeons to evaluate usefulness of robots for heart surgery.
- Investigated sources of kinematic error for surgical robots.
- Researched magnetic position/orientation sensors for use in controlling robots.
- Created controllers for surgical robots, reducing motion errors by 50% in lab trials.
- Invented error metrics for quasi-static control of flexible robots.
- Ran user-study on effectiveness of controllers in image-guided surgery.

### *Research Assistant*

August 1998 - June 2000

Vanderbilt University, Department of Biomedical Engineering

Worked in the Technology-Guided Therapy Lab for Dr Robert Galloway, Jr.

- Constructed an optically-tracked Ultrasound probe.
- Registered images from the tracked Ultrasound probe with CT scans.
- Programmed a renderer for displaying organ models alongside registered images.

## **PROFESSIONAL AFFILIATIONS AND ACTIVITIES**

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### ***Professional Affiliations***

- Member of IEEE (2007 - present)
  - Robotics and Automation Society
  - Engineering in Medicine and Biology Society
  - Control Systems Society
- Member of ASEE (2007 - present)
  - Engineering Technology Division
  - Electrical and Computer Division
  - Educational Research and Methods Division

### ***Activities***

- Reviewer for International Journal of Robotics Research (2008)
- Reviewer for International Conference on Intelligent Robots and Systems (2008)
- Reviewer for ASEE Annual conference (2008)
- Reviewer for ASME Journal of Computing And Information Science In Engineering (2007 - 2008)
- Reviewer for IEEE International Conference on Robotics and Automation (2006)

## **UNIVERSITY SERVICE**

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- Advisor for University Gaming Club (2008-present)
- Initiated and managed departmental seminar for discussing research (2007-2008).
- Member of ETID Social Committee (2007-2008).
- Advisor for student team competing in national Rube Goldberg competition (2007-2008).
- Member of BioMed Initiative Committee (2006-2007).

## **JOURNAL ARTICLES (PEER REVIEWED)**

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**Beasley, Ryan A.**, and Howe, R.D., "Increasing accuracy in image-guided robotic surgery through tip tracking and model based flexion correction," IEEE's Transactions on Robotics, 25.2 (2009): 292-302.

Lahey, J.N., **Beasley, R.A.** Computerizing audit studies, *Journal of Economics Behavior and Organization* (2009), doi:10.1016/j.jebo.2008.02.009.

Stefansic, James D., W. Andrew Bass, Steven Hartmann, **Ryan Beasley**, Tuhin Sinha, David Cash, Alan Herline, and Robert Galloway, Jr. "Design and Implementation of PC-based Image-Guided Surgical System." Computer Methods and Programs in Biomedicine 69.3 (2002): 211-24.

## **CONFERENCE PROCEEDINGS (PEER REVIEWED)**

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Patrick, Andrew, Clint Vigil, **Ryan A. Beasley**, and Ben Zoghi, "Student design and development of a tactile display with three-dimensional movements," Annual Conference of the American Society for Engineering Education, (2009).

- Reddy, Shivananda, Kati Jo Wilson, Ana Goulart, and **Ryan A. Beasley**, "On developing a mesh network of robots for hands-on undergraduate education," 39<sup>th</sup> ASEE/IEEE Frontiers in Education Conference, (2009).
- Zhan, Wei, **Ryan A. Beasley**, Jay Porter, and Joseph Morgan, "Circuit analysis and electrical power system curricular development for the power engineering technology program," Annual Conference of the American Society for Engineering Education, (2009).
- Beasley, Ryan A.**, Ana Goulart, Wei Zhan. "New faculty meetings: Surviving the first year of the tenure track together," Annual Conference of the American Society for Engineering Education, (2008).
- Zhan, W., **Ryan Beasley**. "Life long learning starts in classrooms," Annual Conference of the American Society for Engineering Education, (2008).
- Beasley, Ryan A.**, Wei Zhan, and Ben Zoghi. "A Thorough Hands-on Process to Implement a RFID System." Annual Conference of the American Society for Engineering Education Proceedings, (2007). <http://www.asee.org/acPapers/AC%202007Full971.pdf>
- Beasley, Ryan A.**, and Robert Howe. "Model-Based Correction for Flexible Robotic Surgical Instruments." Robotics: Science and Systems. 1 (2005): 359-64. <http://www.roboticsproceedings.org/rss01/p47.html>
- Beasley, Ryan A.**, Robert Howe, and Pierre Dupont. "Kinematic Error Correction for Minimally Invasive Surgical Robots." IEEE International Conference on Robotics and Automation 2004, Proceedings. 1 (2004): 358-64.
- Beasley, Ryan A.**, and Robert Howe. "Tactile Tracking of Arteries in Robotic Surgery." IEEE International Conference on Robotics and Automation 2002, Proceedings. 4 (2002): 3801-06.

#### **CONFERENCE PROCEEDINGS (NON PEER REVIEWED)**

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- Beasley, Ryan A.**, James Stefansic, Jeannette Herring, W. Andrew Bass, Alan Herline, William Chapman, Benoit Dawant, and Robert Galloway, Jr. "Implementation and Incorporation of Liver 3D Surface Renderings into Interactive Image-Guided Hepatic Surgery." Proceedings of the SPIE - The International Society for Optical Engineering 3976 (2000): 282-89.
- Beasley, Ryan A.**, James Stefansic, Alan Herline, Louis Gutierrez, and Robert Galloway, Jr. "Registration of Ultrasound Images." Proceedings of the SPIE - The International Society for Optical Engineering 3658 (1999): 125-32.

#### **FUNDED PROJECTS**

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- "MRI compatible cable-driven actuators," Cybernet Systems Corp as part of NIH SBIR Phase 1, **Ryan Beasley** (PI), August 2007, \$30,000.
- "Senior capstone project on developing a device for minimizing path length during grocery shopping, in collaboration with HEB grocery store chain," OI Corporation, **Ryan Beasley** (PI), Spring 2008, \$5000.
- "Embedded control system for low-velocity, low-volume liquid flow," OI Corporation, **Ryan Beasley** (PI), Fall 2007, \$5000.

## **PROPOSALS**

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- “Optotactile slip sensor,” Texas Instruments, **Ryan Beasley** (PI), December 2007, *not funded*.
- “SmartBoard installation in engineering technology laboratories,” Classroom Instructional Technology Competitive Proposal FY 2008, Wei Zhan, Ana Goulart, **Ryan Beasley**, Jorge Alvarado, Arunachalam Narayanan, October 2007, *not funded*, \$20,000.
- “Grasp algorithms for optotactile robotic manipulators,” NASA STTR Phase 1, **Ryan Beasley** (PI), September 2007, *not funded*, \$100,000 (\$35,000 to TEES/ETID, subcontracting to Cybernet Systems Corp.).
- “MRI compatible cable-driven actuators,” NIH SBIR Phase 1, subcontract from Cybernet Systems Corp, August 2007, *funded (priority score 136)*, \$100,000 (\$30,000 to TEES/ETID).