

Christopher W. Kennedy

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EDUCATION

Drexel University, Philadelphia PA

Ph.D., Mechanical Engineering, 2004

- Advisor: Dr. Jaydev P. Desai
- Dissertation: Enabling Technologies for Robotically-Assisted Sutureless Coronary Anastomosis

M.S., Mechanical Engineering, 2003

B.S., Mechanical Engineering, 2001

University of Maryland, College Park MD

B.Sc., Physiology, *Cum Laude*, 1997

RESEARCH EXPERIENCE

Johns Hopkins University, Baltimore MD

(10/04 – pres.)

Postdoctoral Fellow, NSF Engineering Research Center for Computer-Integrated Surgical Systems and Technology

- Development of novel technologies for robot-assisted needle-insertion in prostate cancer treatment

Drexel University, Philadelphia PA

(9/01 – 9/04)

Graduate Research Assistant, Department of Mechanical Engineering and Mechanics

- Investigated the use of bilateral teleoperation for robot-assisted Off-pump Coronary Artery Bypass Graft (OPCABG) procedures
- Designed and built a 2 DOF robot to perform a manipulation task similar to the placement of a sutureless anastomotic device
- Developed a dynamic model of the Mitsubishi PA-10 robot arm to enable its use as a surgical robot
- Investigated use of vision information to provide haptic feedback to a surgeon during robot-assisted Coronary Artery Bypass Graft (CABG) procedures

TEACHING EXPERIENCE

Drexel University, Philadelphia PA

(9/01 – 9/04)

Teaching Assistant, Department of Mechanical Engineering and Mechanics

- Haptics for Medical Robotics
- Medical Robotics I, II
- Introduction to Robotics
- Engineering Mechanics: Statics

PUBLICATIONS

Journal Articles

- **Kennedy, C.W.**, and Desai, J.P.: "Modeling and control of the Mitsubishi PA-10 robot arm", *IEEE/ASME Transactions on Mechatronics*. In Press.
- **Kennedy, C.W.**, and Desai, J.P.: "A vision-based approach for estimating contact forces: Applications to robot-assisted surgery", *Journal of Applied Bionics and Biomechanics*. In Press.
- **Kennedy, C.W.**, Hu, T., Desai, J.P., Wechsler, A.S., and Kresh, J.Y.: "A Novel approach to Robotic Cardiac Surgery using Haptics and Vision", *Cardiovascular Engineering: An International Journal*, 2002.

- **Kennedy, C.W.**, Donahue, J.J., Wan, X.S.: "Effects of the Bowman-Birk Protease Inhibitor on Survival of Fibroblasts and Cancer Cells Exposed to Radiation and cis-Platinum." *Nutrition and Cancer*, 26, 209-217, 1996.

Refereed Conference Articles

- **Kennedy, C.W.**, and Desai, J.P.: "Model-based controller for the Mitsubishi PA-10 robot arm: Application to Robot-assisted Surgery", IEEE International Conference on Robotics and Automation (ICRA), April 26 - May 1, 2004, 2523 – 2528, New Orleans, LA.
- **Kennedy, C.W.**, and Desai, J.P.: "Estimation and Modeling of the Harmonic Drive Transmission in the Mitsubishi PA-10 Robot Arm", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2003, Pages: 3331 – 3336, Las Vegas, NV.
- **Kennedy, C.W.**, and Desai, J.P.: "Force Feedback Using Vision", 11th International Conference on Advanced Robotics (ICAR), June 30 - July 3, 2003 University of Coimbra, Portugal.
- **Kennedy, C. W.**, Hu, T. and Desai, J.P.: "Combining Haptic and Visual Servoing for Cardiothoracic Surgery," IEEE International Conference on Robotics and Automation (ICRA), 2002, pp: 2106 -2111, Washington, DC.

PRESENTATIONS

- "Enabling Technologies for Robotically-Assisted Sutureless Coronary Anastomosis", September 2004, Engineering Research Center, Johns Hopkins University. (Job talk)
- "Model-based control of the Mitsubishi PA-10 robot arm: Application to robot-assisted surgery", April, 2004, IEEE Conference on Robotics and Automation (ICRA) 2004, New Orleans.
- "Estimation and Modeling of the Harmonic Drive Transmission in the Mitsubishi PA-10 Robot Arm", October, 2003, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2003, Las Vegas, NV.
- "Combining Haptic and Visual Servoing for Cardiothoracic Surgery", May 2002, IEEE Conference on Robotics and Automation (ICRA), Washington D.C.

HONORS

- Koerner Family Fellowship for Doctoral Studies, Drexel University (9/03)
- Honorable Mention for Emerging Technology, Drexel University Research Day (4/03)
- Best Poster Award for Emerging Technology, Drexel University Research Day (4/01)
- Augustus H. Hess Scholarship for undergraduate research in mechanical engineering, Drexel University (9/00)
- Dean's Scholar , Drexel University (8/98)
- Phi Kappa Phi National Honor Society (8/96)
- Golden Key National Honor Society (8/96)

SERVICE

- *President, Engineering Graduate Association (EGA)*, Drexel University, (6/03 – 6/04)
- *Officer, Graduate Student Association (GSA)*, Drexel University, (6/02 – 6/04)
- *Officer, Graduate Student Research Council (GSRC)*, Drexel University, (6/02 - 6/03)
- *Board Member, Mechanical Engineering Graduate Association (MEGA)*, Drexel University (6/02 – 6/04)
- *Board Member, American Society of Mechanical Engineers (ASME)*, Drexel undergraduate chapter, (9/00 - 6/01)