GANG LI

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EDUCATION

Worcester Polytechnic Institute, Worcester, MA, USA Aug 2011 – Present
Ph.D. Candidate, Mechanical Engineering, GPA: 3.98/4.0, Advisor: Prof. Gregory S. Fischer
Dissertation: Interactive Training of teleoperated robotic system for Real-time MRI-guided steerable needle intervention (in progress)

Harbin Institute of Technology, Harbin, China Jun 2011
M.S. Mechanical Engineering, Advisor: Prof. Zhijiang Du
Thesis: Research on Robot Arm for Minimally Invasive Robotic Surgery System

Harbin Institute of Technology, Harbin, China Jun 2008
B.S. Mechanical Engineering

RESEARCH EXPERIENCE

Research Assistant, Worcester Polytechnic Institute Aug 2011 – Present
- Led the robotics sections of NIH funded project "MR-Guided Precision Conformal Ablation Therapy for Brain Tumors" (with Albany Medical College, UMass Medical School and Acoustic MedSystem, Inc.)
  - Developed 8-DOF MRI-compatible stereotatic neurosurgery robotic system
  - Developed and evaluated 6-DOF robotic system for deep brain stimulation
- Actively work on the NIH funded project "Enabling technologies for MR guided prostate interventions" and Congressionally Directed Medical Research project "Development of an MRI-Guided Intra-Prostatic Needle Placement System" (with Harvard Medical School and Johns Hopkins University)
  - Developed 5-DOF prostate biopsy robot system, currently **approved by IRB for clinical trials.**
  - Developed fully actuated 7-DOF prostate biopsy and brachytherapy robot system
  - Designed continuous uncoupled rotation velocity independent (CURV) needle steering model
  - Developed and evaluated 4-DOF continuum concentric tube robot
  - Designed bilateral teleoperated system with haptic feedback

Teaching Assistant, Worcester Polytechnic Institute Aug 2011 – Oct 2012
- Instructed lab session and graded homework for RBE1001/2002/3001 Unified Robotics

Research Assistant, Harbin Institute of Technology Aug 2008 – Jun 2011
- Responsible for mechanical design and optimization of China State High-Tech Development Plan funded project "Development of Robotic System for Minimally Invasive Surgery"
  - Designed a 7-DOF manipulator for minimally invasive laparascopic surgery
  - Preoperative planning to achieve the operation of collision avoidance and high dexterity

Team Leader, HIT Robot Team, Harbin Institute of Technology Oct 2007 – Aug 2009
- Led the team to develop auto mobile robots for the 7th and 8th Asia-Pacific Robot Contest, sponsored by the Asia-Pacific Broadcasting Union (ABU)
  - Design, fabricate and test a series of auto mobile robots that fulfil the requirements of the contests

Teaching Assistant, Harbin Institute of Technology Mar 2009 – July 2009
- Instructed lab session and graded homework for Engineering Graphics

AWARDS AND HONORS

Champion of ABU Asia-Pacific Robot Contest & ABU ROBCON Award, Tokyo, Japan Aug 2009
Champion of China Domestic Contest for ABU Robot Contest & Best Technology Award June 2009
HIT Graduate Student Scholarship (2 times) Sep 2008 & Sep 2010

Runner-up of China Domestic Contest for ABU Asia-Pacific Robot Contest — July 2008
Mitsubishi Electric Scholarship — Oct 2007
HIT People's Scholarship (5 times) — 2005 - 2008
HIT Best Student Award (2 times) — Dec 2007 & Dec 2009
2nd place Prize of HIT Biomimetic Robot Contest — Sep 2006

REVIEW SERVICES

Reviewer for Journal Articles (6)
International Journal of Medical Robotics and Computer Assisted Surgery
ASME Journal of Dynamic Systems, Measurement and Control
ASME Journal of Medical Devices

Reviewer for Conference Proceedings (24)
IEEE International Conference on Robotics and Automation (ICRA)
International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)
IEEE/RAS-EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob)
Design of Medical Device (DMD)
IEEE International Conference on Technologies for Practical Robot Applications (TePRA)
International Conference on Information Processing in Computer-Assisted Interventions (IPCAI)
IEEE EMBS Special Topic Conference on Healthcare Innovation & Point-of-Care Technologies (HIC-POCT)

PUBLICATIONS

Journal Articles:
[J5] **G. Li,** H. Su, W. Shang, D. Cardona, D. C. Rucker, R. J. Webster III, and G. S. Fischer, "Concentric Tube Continuum Robot with Piezoelectric Actuation for MRI-Guided Closed-loop Targeting", Annals of Biomedical Engineering, 2015 (In Preparation).
[J4] E. Sohrab, W. Shang, **G. Li**, N. A. Patel, G. S. Fischer, J. Tokuda, N. Hata, C. M. Tempany, and Iordachita I., "In-Bore Prostate Transperineal Interventions with an MRI-guided Parallel Manipulator: System Development and Preliminary Evaluation", International Journal of Medical Robotics and Computer Assisted Surgery, 2015 (In Review).
[J3] **G. Li**, H. Su, G. A. Cole, W. Shang, K. Harrington, A. Camilo, J. G. Pilitsis, and G. S. Fischer, "Robotic System for MRI-Guided Stereotactic Neurosurgery", IEEE Transactions on Biomedical Engineering, 2014 (In Press).
[J2] H. Su, W. Shang, G. A. Cole, **G. Li**, K. Harrington, A. Camilo, J. Tokuda, C. M. Tempany, N. Hata, and G. S. Fischer, Piezoelectrically Actuated Robotic System for MRI-Guided Prostate Percutaneous Therapy, IEEE/ASME Transactions on Mechatronics, 2014 (In Press).
[J1] R. Ma, W. Dong, Z. Du, and **G. Li**, "Mechanical Design and Dexterity Optimization for Hybrid Active-Passive Minimally Invasive Surgical Manipulator", Robot, 2013.

Conference Proceedings:
[P10] **G. Li**, N. A. Patel, W. Shang, and G. S. Fischer "Modeling of Continuous Uncoupled Rotation Velocity-independent (CURV) Asymmetric Tip Needle Steering", IEEE International Conference on Robotics and Automation - ICRA, 2015 (In Review).
[P9] N. A. Patel, T. V. Katwijk, **G. Li**, P. Moreira, W. Shang, S. Misra, and G. S. Fischer, "Closed-loop Flexible Needle Steering with Real-time MRI Guidance" , IEEE International Conference on Robotics and Automation - ICRA, 2015 (In Review).
[P8] W. Shang, H. Su, **G. Li**, C. Furlong, and G. S. Fischer, "A Fabry-Perot Interferometry Based MRI-Compatible Miniature Uniaxial Force Sensor for Percutaneous Needle", IEEE SENSORS 2013, Baltimore, MD, Nov. 2013.

[P7] W. Shang, H. Su, **G. Li**, and G. S. Fischer, "Teleoperation System with Hybrid Pneumatic-Piezoelectric Actuation for MRI-Guided Needle Insertion with Haptic Feedback", IEEE/RSJ International Conference on Intelligent Robots and Systems - IROS, Tokyo, Japan, Nov. 2013.

[P6] W. Ji, J. D. Matte, **G. Li**, Y. Ma, H. Su, W. Shang, and G. S. Fischer, "Reconfigurable Fiducial-Integrated Modular Needle Driver for MRI-Guided Percutaneous Interventions", Design of Medical Devices Conferences (DMD), Minneapolis, MN, April 2013.

[P5] **G. Li**, H. Su, W. Shang, J. Tokuda, N. Hata, C. M. Tempany, and G. S. Fischer, "A Fully Actuated Robotic Assistant for MRI-Guided Prostate Biopsy and Brachytherapy", SPIE Medical Imaging (Image-Guided Procedures, Robotic Interventions, and Modeling Conference), Orlando, USA, Feb. 2013.

[P4] G. S. Fischer, H. Su, W. Shang, **G. Li**, N. Hata, and C. M. Tempany, "Teleoperated Needle Placement for Real-time MRI-guided Prostate Interventions", 9th Interventional MRI Symposium (iMRI), Boston, MA, USA, Sept. 2012.

[P3] R. Ma, W. Wang, Z. Du, and **G. Li**, "Design and Optimization of Manipulator for Laparoscopic Minimally Invasive Surgical Robotic System", IEEE International Conference on Mechatronics and Automation, Chengdu, China, Aug. 2012

[P2] R. Ma, D. Wu, Z. Yan, Z. Du, and **G. Li**, "Research and Development of Micro-instrument for Laparoscopic Minimally Invasive Surgical Robotic System", IEEE International Conference on Robotics and Biomimetics, Tianjin, China, Dec. 2010,

[P1] **G. Li**, D. Wu, R. Ma, K. Huang, and Z. Du, "Pose Planning for Robotically Assisted Minimally Invasive Surgery", IEEE the 3rd International Conference on BioMedical Engineering and Informatics – BMEI, Yantai, China, Oct. 2010.