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哈佛大学，工程和应用科学院
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工作经历

博士后研究员, 讲师 (软性外骨骼机器人和康复机器人) 2015/03–今
哈佛大学, 工程和应用科学院 美国麻省剑桥市

研究科学家(微创手术机器人和医疗器械) 2013/03–2015/03
飞利浦北美研究中心 美国纽约州纽约市

实习研究员(非线性系统控制) 2012/06-2012/08
三菱电机北美研究所 美国麻省剑桥市

实习研究员(磁共振兼容手术机器人) 2010/06-2010/08
哈佛大学医学院 美国麻省波士顿市

教育经历

伍斯特理工学院 2013/02
机械工程学博士 美国麻省伍斯特市

纽约州立大学布法罗分校 2008/07
机械工程学硕士 美国纽约州布法罗市

哈尔滨工业大学 06/2006
控制工程与科学学士 黑龙江省哈尔滨市

荣誉和获奖

- 飞利浦北美研究院创新技术转化奖 2014/11
- IEEE国际机器人和自动化大会，最佳医疗机器人二等奖 2012/05
- IEEE国际机器人和自动化大会，美国自然科学基金会议旅行奖 2012/05
- Link Foundation 仿真学研究奖(北美2个获奖人之一) 2012/03
- 美国质量协会Schlesinger博士研究奖 2011/11
- IEEE国际机器人和自动化大会，美国自然科学基金会议旅行奖 2011/05

国际学术期刊和会议任职

- IEEE国际机器人和自动化会议International Conference on Robotics and Automation (ICRA), 副主编
- IEEE 国际生物医学工程学会会议Engineering in Medicine and Biology Conference (EMBC), 副主编
- IEEE国际应用机器人大会International Conference on Technologies for Practical Robot Applications (TePRA)，会议委员会成员
- 美国机械工程师协会，国际医疗器械设计大会ASME Design of Medical Devices Conference，会议委员会成员
- IEEE 机器人学会刊，IEEE机电学会刊，IEEE生物医学工程会刊，国际机器人学IJRR，审稿人

科研和代表性成果

- 核心成员，可穿戴式软性外骨骼机器人，美国国防部，国防高等研究计划署，600万美元项目 2015-今
- 第一完成人，用于脑部肿瘤热烧手术的磁共振兼容机器人，美国国家卫生署，380万美元项目 2013-2017
- 第一完成人，用于前列腺介入手术的磁共振兼容机器人基础技术研发，美国国家卫生署，480万美元项目 2013-2017
- 第一完成人，用于前列腺介入手术的磁共振兼容机器人设计，美国国会军事医学项目，38万美元项目 2009-2012

国际专利

A. Mehendale, F. Sahin G. Cole, **H. Su**, V. Parthasarathy, “Virtually-oriented Electromagnetic Tracking Coil for Catheter based Navigation” 2014/10

H. Su, D. Noonan, A. Tahmasebi, “Motorized Flexible Instrument Positioner with Articulated Linkages” 2014/09

R. Christian, B. Hendriks, **H. Su**, G. Cole, “Biopsy Tool for Detection of Peripheral Lung Cancer” 2014/09

G. Cole, **H. Su**, V. Parthasarathy, “A System for Enhancing Clinical Workflow in Navigation Bronchoscopy Procedures”	2014/07
H. Su, G. Cole, V. Parthasarathy, “Steerable Catheter with Articulated Revolute Joints”	2014/06
H. Su, G. Cole, V. Parthasarathy, “Handheld Catheter Driver with Endoscope Mount Utilizing Friction-Driven Wheel Mechanism”	2013/12
H. Su, G. Cole, V. Parthasarathy, “Rotatable Telescopic Stabilizer for Use of Catheter Inside an Endoscope”	2013/11
G.S. Fischer and **H. Su**, “System and Method for Under Actuated Control of Insertion Path for Asymmetric Tip Needles”	2013/10
G.S. Fischer, **H. Su**, and E. Alexander, "System and Method for Autism Spectrum Disorder Interventions"	2011/08
G.S. Fischer and **H. Su**, "Apparatus and Methods for MRI-Compatible Haptic Interfaces"	2010/11

学术论文

SCI期刊论文(在审)

1. **H. Su**, N. Karavas, C. Walsh, “Autonomous Multi-joint Soft Exoskeleton Suit with Hip and Ankle Assistance for Overground Walking”, Journal of NeuroEngineering and Rehabilitation (影响因子 2.42，康复医学核心期刊)
2. **H. Su**, J. Tokuda, C. Tempany, N. Hata, and G.S. Fischer, “MRI-guided Robotic Prostate Interventions”, Nature Reviews Urology, 2016 (影响因子 4.84，Nature 子期刊)
3. G. Li, **H. Su**, and G. S. Fischer, “Modeling and Control of Gaussian-based Continuous Rotation and Variable Curvature Needle Steering: An MRI-guided Approach”, IEEE Transactions on Robotics, 2016 (影响因子 2.02，机器人学核心期刊)
4. G. Li, **H. Su**, and G. S. Fischer, “An 8-DOF Neurosurgical Robot for MRI-Guided Precision Conformal Ultrasonic Ablation of Metastatic Brain Tumor”, IEEE/ASME Transactions on Mechatronics, 2016 (影响因子 3.85，影响因子最高的机器人期刊)
5. **H. Su**, W. Shang, G. Li, and G.S. Fischer, “Teleoperation System with Hybrid Pneumatic-Piezoelectric Actuation for MRI-Guided Needle Insertion with Haptic Feedback”, Annals of Biomedical Engineering, 2016 (影响因子 2.88，生物医学工程核心期刊)
6. **H. Su**, Y. Ma, W. Shang, and G.S. Fischer, “Cylindrical Helix Imaging Coordinate(CHIC) Fiducial Registration System for Image-Guided Interventions”, Computerized Medical Imaging and Graphics, 2016 (影响因子 1.85)
7. **H. Su**, and G. S. Fischer, “Fiber Optic Sensors for Magnetic Resonance Imaging”, IEEE Sensors Journal, 2016 (影响因子 1.852, 传感器学核心期刊)

SCI期刊论文(已发表)

1. **H. Su**, G.Li, D. C. Rucker, R. J. Webster III, and G.S. Fischer, “A Concentric Tube Continuum Robot with Piezoelectric Actuation for MRI-Guided Closed-Loop Targeting”, Annals of Biomedical Engineering, vol. 3, no. 1, pp. 1-11, 2016 (影响因子 2.88，生物医学工程核心期刊)
2. **H. Su**, W. Shang, G. Cole, G. Li, K. Harrington, A. Camilo, J. Tokuda, C. M. Tempany, N. Hata, G. S. Fischer, "Piezoelectrically Actuated Robotic System for MRI-Guided Prostate Percutaneous Therapy," in IEEE/ASME Transactions on Mechatronics , vol.20, no.4, pp.1920-1932, 2015 (影响因子 3.85，影响因子最高的机器人期刊)
3. **H. Su***, G. Li*, G.A. Cole, W. Shang, J. Pilitsis, and G. S. Fischer, “Robotic System for MRI-Guided Stereotactic Neurosurgery”, IEEE Transactions on Biomedical Engineering, vol. 62, no. 4, pp. 1077-1088, 2015 (影响因子 2.23, 生物医学工程核心期刊)

专著章节

1. **H. Su** and G. S. Fischer, “MRI-guided Surgical Robotics”, Encyclopedia of Medical Robotics, World Scientific Publishers, 2016
2. **H. Su** and G. S. Fischer, “High-field MRI-Compatible Needle Placement Robots for Prostate Interventions: Pneumatic and Piezoelectric Approaches”, eds. T. Gulrez and A. Hassanien, Advances in Robotics and Virtual Reality, Springer-Verlag, 2011
3. H. Huang, **H. Su**, and, C. Ru, “Piezoelectric Driven Ultrasonic Cell Manipulator”, eds. T. Sobh and X. Xiong, Prototyping of Robotic Systems: Applications of Design and Implementation, IGI Global, 2011
4. H. Huang, D. Sun, **H. Su**, and J. Mills, “Force Sensing and Control of Robot-Assisted Cell Injection”, eds. T. Gulrez and A. Hassanien, Advances in Robotics and Virtual Reality, Springer-Verlag, 2011
5. G. Cole, K. Harrington, **H. Su**, A. Camilo, J. Pilitsis, G. S. Fischer, “Closed-Loop Actuated Surgical System Utilizing In-Situ Real-Time MRI Guidance”, Springer Tracts in Advanced Robotics, eds. O. Khatib, V. Kumar, G. Sukhatme,

Springer-Verlag, 2012

国际会议论文

1. **H. Su**, Y. Ding, I. Galiana, J. Speeckaert, N. Karavas, P. Malcolm, C. Siviy, C. J. Walsh, “Evaluation of Force Tracking Controller with Soft Exosuit for Hip Extension Assistance”, The International Symposium on Wearable Robotics, Segovia, Spain, 2016
2. **H. Su***, W. Shang*, 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 2013, Tokyo, Japan, Nov. 2013
3. 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.
4. G. Li, **H. Su**, W. Shang, J. Tokuda, N. Hata, C. Tempany, and G. S. Fischer, “A Fully Actuated Robotic Assistant for MRI-Guided Prostate Biopsy and Brachytherapy", SPIE Medical Imaging, Orlando, USA, 2013
5. 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.
6. Y. Ma, I. Dobrev, W. Shang, **H. Su**, S. Janga, G. S. Fischer, “CHIC: Cylindrical Helix Imaging Coordinate Registration Fiducial for MRI-Guided Interventions”, In Proceedings of the 34th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), San Diego, USA, 2012.
7. **H. Su**, D. Cardona, W. Shang, G. Cole, C. Rucker, R. Webster III and G. Fischer, “A MRI-Guided Concentric Tube Continuum Robot with Piezoelectric Actuation: A Feasibility Study”, IEEE ICRA International Conference on Robotics and Automation, Minnesota, USA, 2012
8. **H. Su**, W. Shang, A. Camilo, J. Tokuda, N. Hata, C. Tempany, and G. S. Fischer, “A networked modular hardware and software system for MRI-guided robotic prostate interventions", SPIE Medical Imaging (Image-Guided Procedures, Robotic Interventions, and Modeling Conference), San Diego, USA, 2012
9. G. S. Fischer, G.A. Cole, and **H. Su**, “Approaches to Creating and Controlling Motion in MRI”, In Proceedings of the 33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Boston, USA, 2011 (Invited Paper)
10. E. Alexander, L. Dickstein-Fischer, X. Yan, **H. Su**, and G. S. Fischer, “An Affordable Compact Humanoid Robot for Autism Spectrum Disorder Interventions in Children”, In Proceedings of the 33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Boston, USA, 2011
11. **H. Su**, I. Iordachita, X. Yan, G. A. Cole, and G. S. Fischer, “Reconfigurable MRI-Guided Robotic Surgical Manipulator: Prostate Brachytherapy and Neurosurgery Applications”, In Proceedings of the 33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Boston, USA, 2011
12. **H. Su**, G.A. Cole, N. Hata, C. Tempany, and G. S. Fischer, “Real-time MRI-Guided Transperineal Needle Placement Prostate Interventions with Piezoelectrically Actuated Robotic Assistance”, Radiological Society of North America 97th Scientific Assembly and Annual Meeting, Chicago, USA ,2011
13. **H. Su**, M. Zervas, C. Furlong and G. S. Fischer, “A Miniature MRI-compatible Fiber-optic Force Sensor Utilizing Fabry-Perot Interferometer”, SEM Annual Conference & Exposition on Experimental and Applied Mechanics, Uncasville, CT, USA, 2011
14. **H. Su**, M. Zervas, G.A. Cole, C. Furlong and G.S. Fischer, “Real-time MRI-Guided Needle Placement Robot with Integrated Fiber Optic Force Sensing”, IEEE ICRA 2011 International Conference on Robotics and Automation, Shanghai, China, 2011
15. H. Huang, **H. Su**, H. Chen, J. K. Mills, “Piezoelectric Driven Non-toxic Injector for Automated Cell Manipulation”, in Stud Health Technol Inform 163 (2011), 231-235. Published by IOS Press
16. **H. Su**, A. Camilo, G. Cole, C. Tempany, N. Hata and G. S. Fischer, “High-Field MRI-Compatible Needle Placement Robot for Prostate Interventions”, in Stud Health Technol Inform 163 (2011), 623-629. Published by IOS Press
17. G. Cole, K. Harrington, **H. Su**, A. Camilo, J. Pilitsis, G. S. Fischer, “Closed-Loop Actuated Surgical System Utilizing In-Situ Real-Time MRI Guidance”, 12th International Symposium on Experimental Robotics (ISER2010), New Delhi & Agra, India, 2010
18. **H. Su**, L. Dickstein-Fischer, K. Harrington, Q. Fu, W. Lu, H. Huang, G. Cole and G.S. Fischer, “Cable-Driven Elastic Parallel Humanoid Head with Face Tracking for Autism Spectrum Disorder Interventions”, In Proceedings of the 32nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Buenos Aires, Argentina, 2010
19. Y. Wang, **H. Su**, K. Harrington and G. Fischer, “Sliding Mode Control of Piezoelectric Valve Regulated Pneumatic Actuator for MRI-Compatible Robotic Intervention”, ASME Dynamic Systems and Control Conference, Boston, USA,

2010

20. **H. Su**, W. Shang, G. Cole, K. Harrington and G. Fischer, “Design of a Haptic Device for MRI-Guided Prostate Needle Brachytherapy”, IEEE Haptics Symposium, Boston, USA, 2010

21. **H. Su** and G. Fischer, “A 3-Axis Optical Force/Torque Sensor for Prostate Needle Placement in Magnetic Resonance Imaging Environments,” IEEE International Conference on Technologies for Practical Robot Applications, Boston, USA, 2009

22. Y. Wang G. Cole, **H. Su**, J. Pilitsis, G. Fischer, “MRI Compatibility Evaluation of a Piezoelectric Actuator System for a Neural Interventional Robot”, In Proceedings of the 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Minneapolis, USA, 2009

23. **H. Su** and V. Krovi, "Decentralized Motion Control of Payload Transport by Nonholonomic Mobile Manipulators," ASME Dynamic Systems and Control Conference, Ann Arbor, USA, 2008

学术讲座

1. “Force Sensing, Teleoperation and Control of Continuum Robot for MRI-Guided Surgery”, 哈佛大学医学院，波士顿儿童医院, 2012/10
2. “Teleoperated Needle Placement for Real-time MRI-guided Prostate Interventions”, 国际介入式磁共振大会, 2012/09
3. “Small, Dexterous and under Control: from Robotic Tentacles to MRI-Guided Surgical Interventions”, 三菱电机北美研究所, 2012/07
4. “Toward Real-Time MRI-Guided Steerable Needle Robots: Experiments with Bevel and Concentric Tube Needles”, IEEE 国际机器人和自动化大会, 2012/05
5. ”Force Sensing and Control of MRI-Compatible Robotic System for Prostate Percutaneous Intervention”, 哈佛大学医学院，布雷格汉姆女子医院, 2010/05
6. “Cooperative Control of Nonholonomic Mobile Manipulator Collective”, 加拿大女皇大学, 2008/11

国际杂志审稿人

- IEEE/ASME Transactions on Mechatronics
- Journal of Robotics and Computer-Integrated Manufacturing
- Measurement Science and Technology (Institute of Physics)
- Journal of Intelligent and Robotic Systems
- ASME Journal of Dynamic Systems, Measurement and Control
- International Journal of Medical Robotics and Computer Assisted Surgery
- Smart Materials and Structures
- Medical Engineering & Physics
- Robotica
- IEEE Transactions on Biomedical Engineering

国际会议审稿人

- IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob)
- Robotics: Science and Systems Conference (RSS)
- IEEE International Conference on Robotics and Automation (ICRA)
- Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)
- Performance Metrics for Intelligent Systems (PerMIS'10) Workshop
- ASME Dynamic Systems and Control Conference (DSCC)
- IEEE/RSJ International Conference on Intelligent RObots and Systems (IROS)
- IEEE Haptics Symposium Conference