

Dr. Gang Chen

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France
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Research interest:

- Modeling and control of micro robot for medical surgery and healthcare applications
- computer-assisted surgery(imaging-guided surgery, surgical navigation)

Education and qualifications:

- **Ph.D. in Medical Robotics**, INSA de Lyon, France, December 2005
Dissertation: “Design, modeling and control of a micro-robot for colonoscopy”
- **MSc in Control Theory & Engineering**, Institute of Automation, Chinese Academy of Sciences, Beijing, China, July 2002
- **BEng (1st) in Manufacturing Engineering**, Jilin University, China, July 1999

Research Experiences

10/2009 - Visiting Research fellow, INRIA Rhone-alpes, France(With Prof. Christian Laugier)

CityHome: French ICT-ASIA project 2008-2010

- Responsible for developing technologies and algorithms for an autonomous wheelchair to provide mobility support for elderly people in household environments

04/2007 – 5/2009 Marie Curie Research Fellow, Unilever R&D, UK

1. **BRIDGET:FP6 Project on transfer of knowledge funded by European Union through Marie Curie Action**
 - o Objective: Develop an advanced biomimetic robotic system for testing healthcare and personal care products
 - Data acquisition of human daily activities through motion tracking system
 - Analysis and modeling of typical human movements
 - Implementation of typical motion patterns to program robots to reproduce human movements
2. **NANOBIOTACT: FP6 STREP(Special Targeted Research Project) project**
 - Objective is to design and construct an articulated artificial finger with a biomimetic sensor that will mimic human tactile sensing abilities.
3. **Behavior monitoring : Unilever project**
 - Build up a wireless sensor system for consumer behavior monitoring
4. **Support on high throughput experiment**
 - Maintenance and technical support on utilization of robotic system for chemistry and biology experiments

02/2006 – 02/2007 Postdoctoral Fellow, INRIA Rhone-Alpes, France (With Prof. Thierry Fraichard and Prof. Christian Laugier)

MOBVIP: Autonomous navigation of driverless vehicles in dynamic urban environments

- Research on motion planning- Partial Motion Planning (PMP) within dynamic environment for an intelligent vehicle called Cycab
- Design and implementation of a real-time control architecture for autonomous navigation

10/2002 - 12/2005 Research Assistant, Laboratories ampere, INSA de Lyon, France (With Prof. Tanneguy Redarce and Prof. Minh Tu Pham)

Project: “Development of an intelligent endoscopic tip”

- Construct a soft continuum robot manipulator to enhance the dexterity of current endoscope.
- Develop and verify the kinematic model for this special robot mechanism.
- Propose and implement a sensor-based guidance control strategy for the advancement of the robot into human colon environment.

10/2000 - 07/2002 Research Assistant, Institute of Automation, Chinese Academy of Sciences (With Prof. Min Tan)

Project “Design and implementation of a vision-based telemanipulation system”

- Design and implementation of a high-level protocol for transmission of control data based on TCP/IP network
- Implementation of a network-based controller software for teleoperation

Publications

Book chapters:

1. **G. Chen**, T. Malej, H. Fourati, M.T. Pham, R. Moreau, S. Sesmat, “A Biomimetic steering robot for Minimally invasive surgery application”, in Advances in robot manipulators, IN-Tech, ISBN 978-953-7619-x-x
2. **G. Chen**, M.T Pham and T. Redarce, “A Guidance Control Strategy for Semi-Autonomous Colonoscopy using a Continuum Robot. In "Recent Progress in Robotics; Viable Robotic Service to Human“, Volume 370 of Lecture Notes in Control and Information Sciences (LNCIS). Springer-Verlag, 2008, pp. 63-78.
3. **G. Chen** and Th. Fraichard, “Architecture for automated driving in urban environments”, In C. Laugier and R. Siegwart, editors, Field and Service Robotics, volume 42 of Springer Tracts in Advanced Robotics Series, Springer, 2008, pp575-584.

Journals:

1. **G. Chen**, M.T. Pham and T. Redarce, “Sensor-based guidance control of a continuum robot for a semi-autonomous colonoscopy”, Robotics and autonomous systems, 57, 6-7, 2008, pp. 712-722
2. G. Thomann, **G. Chen**, T. Redarce, “Design and results of an autonomous bendable colonoscopic Tip”, volume 4, number 3, Journal of Micro-Nano Mechatronics, DOI 10.1007/s12213-008-0006-x, Springer, December, 2008, pp. 103-114

Unilever Internal reports:

1. G.Chen, S.Querios and G. Savill, “A biomimetic robotic system for imitating human motions for testing consumers products”, Unilever
2. G.Chen, A. Speranzon, B. Weber and G. Savill, “Human motion analysis and its use for generating trajectory of a robotic system”, Unilever

Refereed Conferences:

1. **G. Chen**, M.T. Pham, T. Redarce, "A semi-autonomous micro-robotic system for colonoscopy", IEEE Robotics and Biomimetics, Dec. 2008, Bangkok, Thailand
2. **G. Chen**, Th. Fraichard, and L. Martinez-Gomez. A Real-Time Autonomous Navigation Architecture. In Proc. of the IFAC Symp. on Intelligent Autonomous Vehicles, Toulouse (FR), September 2007.
3. **G. Chen**, M.T. Pham, T. Redarce, "Sensor-based Planning and Control of a Continuum Robot for Semi-Autonomous Colonoscopy", Proceedings of International Conference on Advanced Robotics, Aug. 2007, pp.194-199.
4. **G. Chen**, Th. Fraichard, "An architecture for Automated Driving in Urban Environments", In Proc. of the Int. Conf. on Field and Service Robotics, Chamonix (FR), July 2007
5. **G. Chen**, Th. Fraichard, A Real-Time Navigation Architecture for Automated Vehicles in urban Environments, In Proc. of the IEEE Intelligent Vehicles Symposium, Istanbul (TR), June 2007
6. **G. Chen**, M.T. Pham, T. Redarce, "Sensor-based Planning and Control of a Continuum Robot for Semi-Autonomous Colonoscopy", Proceedings of International Conference on Advanced Robotics, Aug. 2007, pp.194-199.
7. **G. Chen**, M.T. Pham, T. Redarce, "Development and Kinematic Analysis of a Silicone-rubber Bending tip for colonoscopy", Proceedings of IEEE/RSJ IROS2006, Oct. 2006, pp.168-173.
8. **G. Chen**, M.T. Pham, T. Redarce, "Design and control of an actuator for colonoscopy", 6th International workshop on Research and Education in Mechatronics 2005, pp.109-114.
9. **G. Chen**, G. Thomann, M. T. Pham, M. Bétemps, T. Redarce, "Modeling and Control of a Colonoscopic Tip under the Disturbance of the Insertion of Colonoscope", Proceedings of IEEE/RSJ IROS 2004, pp. 3315-3320.
10. G. Thomann, **G. Chen**, M.T. Pham, T. Redarce, M. Bétemps, "Performances of New Surgical Tools for Endoscopy", The First World Congress on Men's Health Medicine, PARIS-France, 2004.
11. G. Thomann, T. Redarce, **G. Chen**, M. Bétemps, "First results of the progression of the micro robotic tip for colonoscopy", 35th International Symposium on Robotics (ISR2004), Paris.
12. **G. Chen**, G. Thomann, M. Bétemps, T. Redarce, "Identification of a flexible actuator of an intelligent endoscope" Proceedings of IEEE/RSJ IROS2003, Las Vegas, U.S.A. pp.3355-3360.
13. D. Xu, M. Tan, **G. Chen**, "An Improved Dead Reckoning Method for Mobile Robot with Redundant Odometry Information" in Seventh International Conference on Control, Automation, Robotics and Vision (ICCARV 2002), Singapore, pp. 631-636.
14. **G. Chen**, M. Tan, "The Control Architectures and Learning Strategy of Teams Playing in the RoboCup", CASIA/UK Annual Conference on Automation & Information Technology 2001), Beijing, China, pp.300-305.

Academic Honors and Awards

2007- 2009	Marie Curie Research Fellowship (TOK) sponsored by European Union
10/2002 – 12/2005	Ph.D. Scholarship of EGIDE, France
04/2004	Outstanding Ph.D. student of Chinese Government Award
07/1999	Excellent Student of Jilin Province in JU
07/1995 - 01/1999	First-class Scholarships in JU

Membership of Professional Societies

- IEEE Robotics & Automation Society

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