

CURRICULUM VITA

CHAO LIU

Office Address:

LIRMM, UMR 5506, CNRS
161 Rue Ada, Montpellier
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EDUCATION

Ph.D. Electrical & Electronic Engineering, Nanyang Technological University Singapore Jun 2006

Dissertation: "Adaptive Control of Robot Manipulators with Uncertain Kinematics and Actuator Dynamics"

Advisor: Prof. *Chien Chern Cheah*

Thesis Reviewers: Prof. *J.J.E. Slotine* (MIT), Prof. *Suguru Arimoto* (U. Ritsumeikan)

B.E. Control Science and Engineering, Shandong University, China Jul 2000
Overall Ranking: 1st/65 (GPA=3.8/4)

RESEARCH INTERESTS

- Medical/Surgical robotics
- Teleoperation & Haptics
- Human-machine interaction
- Nonlinear control systems

PROFESSIONAL EXPERIENCES

- *CR1 Research Scientist* (2012-present)

French National Center for Scientific Research (CNRS)

Department of Robotics, LIRMM (CNRS-UM2), Montpellier, France

- *CR2 Research Scientist* (2008-2012)

French National Center for Scientific Research (CNRS)

Department of Robotics, LIRMM (CNRS-UM2), Montpellier, France

- *Post-Doctoral Researcher* (2007-2008)

University of Montpellier 2, Montpellier, France

- *Research Fellow* (2005-2006)

Intelligent Systems Center, Nanyang Technological University, Singapore

- *Research Assistant* (2001-2005)

School of E.E.E., Nanyang Technological University, Singapore

- *System Engineer* (2000-2001)

Perspective Technology Development Ltd., China

HONORS & AWARDS

- "Outstanding Reviewer" for Automatica, 2017

PROFESSIONAL INVOLVEMENTS

- **Project Evaluation Committee Expert:**
French National Research Agency (ANR)
Swiss National Science Foundation (SNSF)

- **Research Community Service:**

IEEE Technical Committee on *Surgical Robotics* (2011 ~)

IEEE Technical Committee on *Telerobotics* (2011 ~)

IEEE Technical Committee on *Haptics* (2011 ~)

IFAC Technical Committee on “*Biological and Medical systems*” (2012 ~)

Technical Editor, IEEE/ASME Transactions on Mechatronics, 2020~

Guest Editor, SI on “Perception Recovery and Augmentation in Medical Robotics”, Frontiers in Neurorobotics, 2021

Guest Editor, SI on “Unmanned Autonomous Systems in Complex Environments”, Complexity, 2021

Guest Editor, SI on “Continuum, Compliant, Cognitive, and Collaborative Surgical Robots”, Journal of Medical Robotics Research, 2017

Associate Editor, IEEE International Conference on Robotics and Automation, ICRA 2014

Associate Editor, IEEE International Conference on Advanced Robotics & Mechatronics, 2021

Co-organizer, Workshop on “Dexterous manipulation in the real-contact context: new progress and challenges”, at IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2021, Prague, Czech

Co-organizer, Workshop on “C4 Surgical Robots: Compliant, Continuum, Cognitive, and Collaborative”, at IEEE International Conference on Robotics and Automation, ICRA 2017, Singapore

Organizing Committee, Joint Workshop on New Technologies for Computer/Robot Assisted Surgery, CRAS 2017, 2018, 2019, 2020, 2021

International Program Committee, the International Conference on Robotics, Computer Vision and Intelligent Systems, ROBOVIS 2020

International Program Committee, the International Program Committee of the Conference on Signal, Control and Communication, SCC 2019

International Program Committee, the World Congress on Intelligent Control and Automation, WCICA 2010, 2012, 2014, 2018

International Program Committee, International Conference on Intelligent Manufacturing and Internet of Things, IMIOT 2018

Program Committee, 5th International Conference on Cloud and Robotics, ICCR 2018

International Program Committee, the International Conference on Modelling, Identification and Control, ICMIC 2015, 2016, 2017

Program Committee, IEEE International Conference on Information and Automation, ICIA 2013, 2014, 2015, 2016

Program Committee, the Canadian Conference on Electrical and Computer Engineering (CCECE), 2015

International Program Committee, the International Conference on Control, Automation, Robotics & Vision, ICARCV 2006, 2008, 2010, 2012, 2014

Program Committee, IEEE International Conference on Robotics and Biomimetics, ROBIO 2013, 2014

International Program Committee, the International Conference on Intelligent Robotics and Applications, ICIRA 2010

International Program Committee, the IEEE Conference on Robotics, Automation and Mechatronics, RAM 2006, 2008, 2010

Program Committee, IEEE International Conference on Automation and Logistics, ICAL 2008, 2009

Session Chair, "Robot Manipulators and Control", the 9th International Conference on Control, Automation, Robotics & Vision, ICARCV 2006

- **Peer Reviewers:**

International Journals

IEEE Transactions on Robotics

IEEE Transactions on Haptics

IEEE Transactions on Biomedical Engineering

IEEE Transactions on Cybernetics

IEEE/ASME Transactions on Mechatronics

IEEE Transactions on Industrial Electronics

IEEE Access

IEEE Robotics and Automation Letters (RAL)

IEEE Transactions on Industrial Informatics

Advanced Robotics

Automatica

ASME Journal of Mechanisms and Robotics

Applied Bionics and Biomechanics

Journal of Medical Robotics Research

International Journal of Neural Systems

Journal of Intelligent and Robotic Systems

Journal of Control Engineering and Technology

Neurocomputing

Ocean Engineering

Robotics and Autonomous Systems

Sensors

European Journal of Control

Mechatronics

Journal of Control, Automation and Electrical Systems

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International Conferences

IEEE International Conference on Robotics and Automation (ICRA)

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

IEEE Conference on Decision and Control (CDC)

American Control Conference (ACC)

International Conference Med. Image Computing & Comp. Assisted Intervention (MICCAI)

Annual International IEEE EMBS Conference (EMBC)

IEEE International Conference on Control Applications (CCA)

IEEE International Conferences on Robotics, Automation & Mechatronics (RAM)

IFAC World Congress

International Symposium on Medical Robotics (ISMR)

European Control Conference (ECC)

...

- **Professional & Honorary Societies:**

Senior Member, **IEEE**

Member, **Sigma Xi**

RESEARCH PROJECTS

1. **Exploring muscle state information from surface EMG signals to improve surgical training and skill assessment**
PI, Jan. 2019 – Nov. 2020 (*10.5K Euros*, Funded by LabEx NUMEV, France)
2. **TS2RT (Towards Safer and Smarter Robotic-assisted Telesurge)**
PI, Jan. 2018 – Dec. 2020 (*15K Euros*, Funded by CNRS, France)
3. **ROBACUS (ROBot léger pour l’insertion d’Aiguille téléopérée avec Compensation de moUvements physiologiques)**
Participant, Mar. 2012 – Feb. 2015 (*586.2K Euros*, Funded by ANR, France)
4. **HaTUMoCo (Haptic Teleoperation with Uncertainty and Motion Compensation)**
PI, Feb. 2010 - Feb. 2012 (*30K Euros*, Funded by CNRS, France)
5. **ARAKNES (Array of Robots Augmenting the KiNematics of Endoluminal Surgery)**
Participant, May 2008 - April 2012 (*11.1M Euros*, Funded by Europe Union)
6. **USComp (Compensation temps réel du mouvement physiologique sous imagerie ultrasonore)**
Participant, Dec. 2008 – May 2012 (*1.54M Euros*, Funded by ANR, France)
7. **AccuRobAs (Accurate Robot Assistant)**
Participant, Oct 2006 – Oct 2009 (*3.79M Euros*, Funded by Europe Union)

STUDENT SUPERVISION

Research Engineer:

Chenji LI

November 2021 ~ present

“Multimodal Sensor Based Surgical Skill Analysis”

PhD These:

Fadi ALMASALMAH ALYOUSEF

November 2021 ~ present

“Sécurité des Gestes Chirurgicaux Télé-opérés à Retour d'Effort”

Mohamed Nassim BOUSHAKI

October 2012 ~ October 2016

“Design Optimization and Control for Concentric Tube Robot in Assisted Single-Access Laparoscopic Surgery”

Jing GUO

November 2012 ~ March 2016

“Enhanced Wave Variable Based Haptic Teleoperation for Robotic-Assisted Surgery with Time Delay”

Abdulrahman ALBAKRI

October 2011 ~ December 2015

“Haptic Teleoperation for Robotic-Assisted Surgery”

Master These/Projects:

Makinthan THANGARAJAH, February 2022

“Design and Control of a Haptic Teleoperation Device”

Tianming HU, August 2020

“Intelligent Transfer of Human Skill to Surgical Robot using EMG Signal”

Ege GURSOY, Esther GERUNA, February 2020

“Build, Program and Control Haptic Devices”

Walid REMMAS, Tsiory MAMONJY, February 2018

“Latest Developments in Haptic Teleoperation”

Auguste COURTIN, Sep. 2017

“Augmented Perception in Transoral Robotic Surgery for Tongue Base Cancer”

Oubad ANAS, Baha Eddine MEDMOUNE, July 2017

“Modélisation géométrique, cinématique et dynamique d'un mécanisme de tensegrity sous V-REP”

Antonio PAPPALARDO (November 2013 ~ May 2015)

Exchanging Master Student - Politecnico Milano, Italy

"Force Control for Robot-Assisted Minimally Invasive Surgery"

Yacine MOKHTARI, July 2011

"Simulation and experimental study of force control on soft tissue"

Hayet SFIHI, July 2011

"Performance studies of task-space and joint-space position control methods for robot manipulator"

Visiting Students:

Yuhang YE, April ~ June 2019 (Master student)

“Surface EMG Signal Processing and Analysis for Robotic Surgical Training”

Jing LUO, November ~ December 2018 (Ph.D. student)

“Research on Human-Robot Interaction Strategies for Surgical Robotic Systems”

TEACHING COURSES

- Linear control systems
- Nonlinear control systems
- Teleoperation
- Biomedical system modeling and control

INVITED TALKS

1. "Haptic Teleoperation and Concentric Tube Robot for Robot-Assisted Surgery", Tutorial on Mechatronics for medical robotics – How to succeed in medical mechatronic development, IEEE/ASME Int. Conf. Advanced Intelligent Mechatronics (AIM) 2014, Besançon, France
2. “Haptic Teleoperation and Concentric Tube Robot - Some New Control Developments for New Surgical Robot Applications”, invited mini-symposium talk at the 36th International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'14), Chicago, USA, 2014
3. “Research Activities on Surgical Robotics in LIRMM”, Invited speech at the HCST Symposium on Medical Robotics, 23 March, 2015, Tel-Aviv, Israel
4. “A Concentric Tube Robot Platform for Surgical Application: Design, Control and Experiments”, Journée GT1 & GT6 -Conception mécatronique pour les interventions minimales invasives, 29 June 2017, ISIR, Paris

PUBLICATIONS

Book Chapters:

1. J. Guo, C. Liu, and P. Poignet, "Effect of Non-passive Operator on Enhanced Wave-Based Teleoperator for Robotic-Assisted Surgery: First Case Study", in *New Trends in Medical and Service Robots - Human Centered Analysis, Control and Design*, P. Wenger, C. Chevallereau, D. Pisla, H. Bleuler, A. Rodić (Eds.), Springer, ISBN 978-3-319-30674-2, 2016.
2. L. Alonso Sanchez, M.Q. Le, K. Rabenoroso, C. Liu, N. Zemiti, P. Poignet, E. Dombre, A. Menciassi, P. Dario, "A Case Study of Safety in the Design of Surgical Robots: The ARAKNES Platform", in *Frontiers of Intelligent Autonomous Systems*, Sukhan Lee, Kwang-Joon Yoon, Jangmyung Lee (Eds.), Springer, ISBN 978-3-642-35485-4, 2013.

Journal Articles:

1. C. Liu, C. C. Cheah, "Task-space Adaptive Setpoint Control for Robots with Uncertain Kinematics and Actuator Model", *IEEE Transactions on Automatic Control*, pp.1854-1860, Vol.50. No. 11, Nov. 2005.
2. C. C. Cheah, C. Liu and J. J. E. Slotine, "Experiments on Adaptive Control of Robots with Uncertain Kinematics and Dynamics", *Experimental Robotics IX*, pp. 57-67, 2006.
3. C. C. Cheah, C. Liu and J. J. E. Slotine, "Adaptive Tracking Control for Robots with Unknown Kinematic and Dynamic Properties", *International Journal of Robotics Research*, pp. 283-296, Vol. 25, No. 3, Mar. 2006
4. C. Liu, C. C. Cheah and J. J. E. Slotine, "Adaptive Jacobian Tracking Control of Rigid-Link Electrically Driven Robots based on Visual Task-Space Information", *Automatica*, pp. 1491-1501, Vol. 42, Iss. 9, Sep. 2006
5. C. C. Cheah, C. Liu and J. J. E. Slotine, "Adaptive Jacobian Tracking Control of Robots with Uncertainties in Kinematic, Dynamic and Actuator Models", *IEEE Transactions on Automatic Control*, pp. 1024-1029, Vol. 51, No. 6, Jun. 2006
6. C. Liu, C. C. Cheah and J. J. E. Slotine, "Adaptive Task-Space Regulation of Rigid-Link Flexible-Joint Robots with Uncertain Kinematics", *Automatica*, Issue 44:7, Jul. 2008.
7. R. Richa, P. Poignet, C. Liu, "Three-dimensional Motion Tracking for Beating Heart Surgery Using a Thin-Plate Spline Deformable Model", *International Journal of Robotics Research*, pp. 218-230, Vol. 29, Feb. 2010.
8. C. C. Cheah, C. Liu and J. J. E. Slotine, "Adaptive Jacobian vision based control for robots with uncertain depth information", *Automatica*, pp. 1228-1233, Vol. 46, Issue 7, July 2010
9. X. Xiang, C. Liu, B. Jouvencel and L. Lapiere, "Synchronized Path Following Control of Multiple Homogenous Underactuated AUVs", *Journal of Systems Science and Complexity*, pp. 71-89, Vol. 25, No. 1, Feb. 2012
10. W. K. Wong, B. Yang, C. Liu and P. Poignet, "A Quasi-Spherical Triangle Based Approach for Efficient 3-D Soft-Tissue Motion Tracking", in the *IEEE/ASME Transactions on Mechatronics*, Vol. 18, pp. 1472 - 1484, Oct. 2013
11. B. Yang and C. Liu, "Robust 3D Motion Tracking for Vision-Based Control in Robotic Heart Surgery", *Asian Journal of Control*, Vol. 16, Issue 3, pp. 632-645, May 2014
12. B. Yang, W. K. Wong, C. Liu and P. Poignet, "3D Soft-Tissue Tracking Using Spatial-Color Joint Probability Distribution and Thin-Plate Spline Model", *Pattern Recognition (IF=2.632)*, Vol. 47, Issue 9, pp. 2962-2973, September 2014
13. P. Moreira, N. Zemiti, C. Liu and P. Poignet, "Viscoelastic model based force control for soft tissue interaction and its application in physiological motion compensation", *Computer Methods and Programs in Biomedicine (IF=1.555)*, available online Feb. 2014
14. M. Boushaki, M. T. Chikhaoui, K. Rabenoroso, C. Liu, N. Andreff and P. Poignet, "Conception, modélisation et commande des robots à tubes concentriques : vers des applications médicales", *Techniques de l'Ingénieur: Conception, modélisation et commande en robotique (in French)*, Vol. TIB398DUO, pp. 1-29, May 2016.

15. A. Pappalardo, A. Albakri, C. Liu, L. Bascetta, E. De Momi and P. Poignet, "Hunt-Crossley Model Based Force Control for Minimally Invasive Robotic Surgery", *Biomedical Signal Processing and Control*, Vol. 29, pp. 31-43, August 2016.
16. B. Yang, C. Liu, W. Zheng and S. Liu, "Motion prediction via online instantaneous frequency estimation for vision-based beating heart tracking", *Information Fusion (IF=4.353)*, Vol. 35, pp. 58-67, May 2017
17. B. Yang, C. Liu, K. Huang and W. Zheng, "A triangular radial cubic spline deformation model for efficient 3D beating heart tracking", *Signal, Image and Video Processing*, Vol. 11, Issue 7, pp. 1329–1336, October 2017
18. X. Xiang, C. Liu, H. Su and Q. Zhang, "On decentralized adaptive full-order sliding mode control of multiple UAVs", *ISA Transactions (IF=3.394)*, Vol. 71, Part 2, pp. 196-205, Nov. 2017
19. C. Liu, J. Guo and P. Poignet, "Nonlinear Model-Mediated Teleoperation for Surgical Applications under Time Variant Communication Delay", *IFAC-PapersOnline*, Vol. 51, Iss. 22, pp. 493-499, 2018
20. B. Yang, C. Liu, W. Zheng, S. Liu and K. Huang, "Reconstructing a 3D heart surface with stereo-endoscopy by learning eigen-shapes", *Biomedical optics express*, Vol. 9(12), pp. 6222-6236, 13 Nov. 2018
21. J. Guo, C. Liu, P. Poignet. "A Scaled Bilateral Teleoperation System for Robotic-Assisted Surgery with Time Delay", *Journal of Intelligent and Robotic Systems*, Springer Verlag, Issue 1, Vol. 95, pp. 165-192, July 2019
22. C. Yang, J. Luo, C. Liu, M. Li and S. L. Dai, "Haptics-Electromyography Perception and Learning Enhanced Intelligence for Teleoperated Robot", *IEEE Transactions on Automation Science and Engineering*, vol. 16, no. 4, pp. 1512-1521, Oct. 2019
23. J. Luo, C. Yang, H. Su and C. Liu, "A Robot Learning Method with Physiological Interface for Teleoperation Systems", *Applied Science (MDPI)*, 9(10), 2099, 2019
24. J. Luo, C. Liu, C. Yang, "Estimation of EMG-Based Force Using a Neural-Network-Based Approach", *IEEE Access*, Vol. 7, Issue 1, pp. 64856-64865, December 2019
25. J. Luo, C. Liu, N. Wang and C. Yang, "A wave variable approach with multiple channel architecture for teleoperated system", *IEEE Access*, (early access), 04 October 2019
26. J. Luo, C. Liu, Y. Feng and C. Yang, "A method of motion recognition based on electromyographic signals", *Advanced Robotics*, Vol. 34, pp. 976-984, 07 Apr 2020
27. J. Guo, Y. Liu, J. Wang, C. Zeng, J. Huang and C. Liu, "The Design of Compact Robotic-Assisted Needle Position System with MPC-Based Remote Control", *Complexity*, Vol. 2020, 16 Sep. 2020
28. J. Guo, Y. Liu, Q. Qiu, J. Huang, C. Liu, Z. Cao and Y. Chen, "A Novel Robotic Guidance System with Eye Gaze Tracking Control for Needle based Interventions", *IEEE Transactions on Cognitive and Developmental Systems*, vol. 13, no. 1, pp. 179-188, March 2021
29. W. Zhang, G. Yao, B. Yang, W. Zheng and C. Liu, "Motion Prediction of Beating Heart Using Spatio-Temporal LSTM", *IEEE Signal Processing Letters* (online)
30. S. Xu, B. Yang, C. Xu, J. Tian, Y. Liu, L. Yin, S. Liu, W. Zheng and C. Liu, "Sparse angle CBCT reconstruction based on guided image filtering", *Frontiers in Oncology* (to appear)

Conference Papers:

1. C. C. Cheah, C. Liu and J. J. E. Slotine, "Approximate Jacobian Adaptive Control for Robot Manipulators", *Proceeding of the International Conference on Robotics & Automation (ICRA 04)*, New Orleans, LA, pp.3075-3080, April 2004.

2. C. Liu, C. C. Cheah, "Task-space Adaptive Setpoint Control for Robots with Uncertain Kinematics and Actuator Model", *Proceeding of the American Control Conference (ACC 04)*, Boston, Massachusetts, pp. 5268-5273, June 30 - July 2 2004.
3. C. Liu, C. C. Cheah and H. C. Liaw, "Adaptive Regulation of Robots using Approximate Models", *Proceedings of the IEEE International Symposium on Intelligent Control (ISIC 04)*, Taipei, Taiwan, pp. 180-185, September 2004.
4. C. C. Cheah, C. Liu and H. C. Liaw, "Stability of Inverse Jacobian Control for Robot Manipulator", *Proceedings of the IEEE International Conference on Control Applications (CCA 04)*, Taipei, Taiwan, pp. 321-326, September 2004.
5. C. Liu, C. C. Cheah, "Adaptive Regulation of Rigid-Link Electrically Driven Robots with Uncertain Kinematics", *Proceeding of the IEEE International Conference on Robotics & Automation (ICRA 05)*, Barcelona, Spain, pp. 3273-3278, April 2005.
6. C. C. Cheah, C. Liu and J. J. E. Slotine, "Adaptive Jacobian Tracking Control of Robots based on Visual Task-space Information", *Proceeding of the IEEE International Conference on Robotics & Automation (ICRA 05)*, Barcelona, Spain, pp. 3509-3514, April 2005.
7. C. Liu, C. C. Cheah and J. J. E. Slotine, "Adaptive Task-Space Regulation of Rigid-Link Flexible-Joint Robots with Uncertain Kinematics", *IEEE International Conference on Robotics & Automation (ICRA 06)*, Orlando, Florida, USA, pp. 2565-2570, May 2006.
8. C. Liu, C. C. Cheah and J. J. E. Slotine, "Adaptive Jacobian PID Regulation for Robots with Uncertain Kinematics and Actuator Model", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 06)*, Beijing, China, pp. 3044-3049, October 2006.
9. C. C. Cheah, C. Liu and J. J. E. Slotine, "Adaptive Vision Based Tracking Control of Robots with Uncertainty in Depth Information", *IEEE International Conference on Robotics & Automation (ICRA 07)*, Roma, Italy, pp. 2817-2822, April 2007.
10. R. Richa, P. Poignet, C. Liu, "Deformable Motion Tracking of the Heart Surface", In *Proceedings of IEEE Conference on Intelligent Robots and Systems (IROS '08)*, pp. 3997-4003, Nice, France, 2008
11. R. Richa, P. Poignet, C. Liu, "Efficient 3D Tracking for Motion Compensation in Beating Heart Surgery", In *Proceedings of Medical Image Computing and Computer-Assisted Intervention (MICCAI '08)*, volume 5242-II, pages 684-691, New York, USA, 2008
12. P. Poignet, A. Chemori, N. Zemiti, C. Liu, "Some Control-Related Issues in Mini-Robotics for Endoluminal Surgery", In *Proceedings of International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 09)*, Minnesota, USA, 2009
13. C. Liu and P. Poignet "SP-ID Regulation of Rigid-Link Electrically-Driven Robots with Uncertain Kinematics", In *Proceedings of IEEE International Conference on Robotics & Automation (ICRA 10)*, Alaska, USA, 2010
14. C. Liu, X. Xiang and P. Poignet, "Adaptive Tracking Control of Rigid-Link Flexible-Joint Robot Manipulator with Uncertainties", in *Proceedings of IFAC 18th World Congress (IFAC2011)*, pp. 10300-10306, Milan, Italy, 2011
15. Y. Kobayashi, P. Moreira, C. Liu, P. Poignet, N. Zemiti, M. G. Fujie, "Haptic Feedback Control in Medical Robots through Fractional Viscoelastic Tissue Model", in *Proceedings of the 33rd International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'11)*, pp. 6704-6708, Boston, USA, 2011
16. C. Liu, P. Moreira, N. Zemiti, P. Poignet, "3D Force Control for Robotic-Assisted Beating Heart Surgery Based on Viscoelastic Tissue Model", in *Proceedings of the 33rd International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'11)*, pp. 7054-7058, Boston, USA, 2011
17. L. A. Sanchez Secades, C. Liu, C. Stefanini, N. Zemiti, A. Menciassi, P. Poignet, P. Dario, "Real-Time Control and Evaluation of a Teleoperated Miniature Arm for Single Port Laparoscopy",

in Proceedings of the *33rd International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'11)*, pp. 7049-7053, Boston, USA, 2011

18. P. Poignet, R. Richa, A. Bo, C. Liu, "Robust 3D tracking for robotic-assisted beating heart surgery", the *33rd International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'11)*, invited session

19. P. Moreira, C. Liu, N. Zemiti and P. Poignet, "Force Control for Robotic-Assisted Surgery Based on Viscoelastic Tissue Model", In Proceedings of the International Conference SKILLS 2011, Montpellier, France, Dec. 2011

20. Xianbo Xiang, Lionel Lapierre, Chao Liu, Bruno Jouvencel, "Path tracking: combined path following and trajectory tracking for autonomous underwater vehicles", In Proceedings of *IEEE Conference on Intelligent Robots and Systems (IROS'11)*, pp. 3558-3563, San Francisco, USA, 2011

21. P. Moreira, C. Liu, N. Zemiti and P. Poignet, "Soft Tissue Force Control Using Active Observers and Viscoelastic Interaction Model", In Proceedings of *IEEE International Conference on Robotics & Automation (ICRA'12)*, Saint Paul, MN, USA, 2012

22. L. A. S. Secades, M. LE, C. Liu, N. Zemiti and P. Poignet, "The Impact of Interaction Model on Stability and Transparency in Bilateral Teleoperation for Medical Applications ", In Proceedings of *IEEE International Conference on Robotics & Automation (ICRA'12)*, Saint Paul, MN, USA, 2012

23. C. Liu, P. Moreira and P. Poignet, "Viscoelastic Model Based Force Tracking Control for Robotic-Assisted Surgery", in Proceedings of *IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob'12)*, pp. 1199-1204, Roma, Italy, 2012

24. L.A. Sanchez, M.Q. Le, K. Rabenoroso, C. Liu, N. Zemiti, P. Poignet, E. Dombre, A. Menciassi and P. Dario, "A Case Study of Safety in the Design of Surgical Robots : The ARAKNES platform", in Proceeding of *12th International Conference on Intelligent Autonomous Systems (IAS'12)*, Jeju, Korea, 2012

25. P. Moreira, C. Liu, N. Zemiti and P. Poignet, "Beating Heart Motion Compensation Using Active Observers and Disturbance Estimation", in Proceedings of *10th IFAC Symposium on Robot Control (SYROCO'12)*, Dubrovnik, Croatia, September 2012

26. A. Albakri, C. Liu and P. Poignet, "Stability and Performance Analysis of Three-Channel Teleoperation Control Architectures for Medical Applications", in Proceedings of *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'13)*, Tokyo, Japan, November 2013

27. A. Sanchez, C. Liu, N. Zemiti, P. Poignet and E. Dombre, "Control of meso-robots for endoluminal Surgery", the *3rd Joint Workshop on New Technologies for Computer/Robot Assisted Surgery (CRAS'13)*, Verona, Italy, September 2013

28. M. Boushaki, C. Liu and P. Poignet, "Task-Space Position Control of Concentric-Tube Robot with Inaccurate Kinematics Using Approximate Jacobian", In Proceedings of *IEEE International Conference on Robotics and Automation (ICRA'14)*, Hong Kong, China, 2014

29. C. Liu, D. Zhao and X. Xiang, "Force Synchronization of Multiple Robot Manipulators: A First Study", in Proceedings of the *33rd Chinese Control Conference (CCC'14)*, Nanjing, China, 2014

30. J. Guo, C. Liu and P. Poignet, "Scaled Position-Force Tracking for Wireless Teleoperation of Miniaturized Surgical Robotic System", the *36th International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'14)*, Chicago, USA, August 2014

31. C. Liu and P. Poignet, "Haptic Teleoperation and Concentric Tube Robot - Some New Control Developments for New Surgical Robot Applications", the *36th International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'14)*, **invited**, Chicago, USA, August 2014

32. A. Albakri, C. Liu and P. Poignet, "Environment Modeling with Physiological Motion Disturbance for Surgical Teleoperation", in Proceedings of *the 13th International Conference on Control, Automation, Robotics and Vision (ICARCV'14)*, Singapore, Dec. 2014
33. J. Guo, C. Liu and P. Poignet, "Stable and Enhanced Position-Force Tracking for Bilateral Teleoperation with Time Delay", in Proceedings of *the 14th annual European Control Conference (ECC'15)*, Linz, Austria, Jul. 2015
34. J. Guo, C. Liu and P. Poignet, "Enhanced Position-Force Tracking of Time-Delayed Teleoperation for Robotic-Assisted Surgery", in Proceedings of *the 37th International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'15)*, Milan, Italy, Aug. 2015
35. B. Yang, C. Liu, P. Poignet, W. Zheng and S. Liu, "Motion Prediction Using Dual Kalman Filter for Robust Beating Heart Tracking", in Proceedings of *the 37th International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'15)*, Milan, Italy, Aug. 2015
36. M. Boushaki, C. Liu, B. Herman, V. Trevillot, M. Akkari and P. Poignet, "Optimization of Concentric-Tube Robot Design for Deep Anterior Brain Tumor Surgery", In Proceedings of the 14th International Conference on Control, Automation, Robotics and Vision (ICARCV'16), Thailand, Nov. 2016
37. C. Liu, J. Guo and P. Poignet, "Nonlinear Model-Mediated Teleoperation for Surgical Applications under Time Variant Communication Delay", In Proceedings of the 12th IFAC Symposium on Robot Control (SYROCO'18), Budapest, Hungary, Sep. 2018
38. C. Liang, C. Yang, C. Liu, Y. Feng, "MYO Armband and Leap Motion data fusion with OpenSim based Virtual Reality Environment", In Proceedings of the 3rd International Conference on Cognitive Systems and Information Processing (ICCSIP'18), Beijing, China, Nov. 2018
39. J. Luo, C. Yang, C. Liu, Y. Yuan and Z. Li, "Wrist Motion Recognition by Using Electromyographic Signals", IEEE 4th International Conference on Advanced Robotics and Mechatronics (ICARM'19), Osaka, Japan, July 2019
40. C. Liang, C. Liu, X. Liu, L. Cheng and C. Yang, "Robot Teleoperation System Based on Mixed Reality", IEEE 4th International Conference on Advanced Robotics and Mechatronics (ICARM'19), Osaka, Japan, July 2019
41. J. Luo, C. Liu, Y. Li and C. Yang, "A Framework of Human impedance Estimation for Human-Robot Interaction", the 25th International Conference on Automation and Computing (ICAC'19), Lancaster, UK, Sep. 2019
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