Professor Liu, Yun-hui

Professor

BEng, Beijing Institute of Technology;
MEng, Osaka University;
PhD, University of Tokyo;
Fellow IEEE

Address:
Mechanical and Automation Engineering
Room 208, William M.W. Mong Engineering Building
Chinese University of Hong Kong, Shatin, N.T.
Hong Kong SAR, China

Tel:	(852) 3943 8340
Fax:	(852) 2603 6002
e-mail:	yhliu@mae.cuhk.edu.hk
Website:	http://www.mae.cuhk.edu.hk/~yhliu
Laboratory:	Networked Sensors and Robotics Laboratory

Biography

Yunhui Liu received the B.Eng. degree in applied dynamics from Beijing Institute of Technology, Beijing, China, in 1985, the M.Eng. degree in mechanical engineering from Osaka University, Osaka, Japan, in 1989, and the Ph.D. degree in mathematical engineering and information physics from the University of Tokyo, Tokyo, Japan, in 1992.

He worked with the Electrotechnical Laboratory, MITI, Japan, from 1992 to 1995. Since February 1995, he has been with the Chinese University of Hong Kong and is currently a Professor at the Department of Mechanical and Automation Engineering. He is also a ChangJiang Professor (visiting) of the National University of Defense Technology and a Visiting Professor of Harbin Institute of Technology. He has published over 200 papers in refereed journals and refereed conference proceedings. His research interests include visual servoing, medical robotics, multifingered robot hands, mobile robots, sensor networks, and machine intelligence. Dr. Liu has received numerous research awards from international journals and international conferences in robotics and automation and government agencies. He is the Editor-in-Chief of a new journal "Robotics and Biomimetics" to be launched in 2014 by Springer and an Editor of Advanced Robotics. He was an Associate Editor of the IEEE TRANSACTIONS ON ROBOTICS AND AUTOMATION from 2001 to 2004 and the general chair of the 2006 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).

Research

- Medical robotics, biomedical sensors and systems,
- vision-based control of robotic systems, aerial robots,
- mobile robotics, mutli-fingered grasping.
- Research Grants:
  - Yunhui Liu (PI), et al., "A robotic assistant for manipulating uterus in hysterectomy," HK$4,999,720, Innovation and Technology Fund, 2012-2014.
  - Yunhui Liu (PI), et al., "Development of a robotic system for nasal surgery", HK$998,023, Innovation and Technology Fund, 2010-2012.
  - Yunhui Liu (PI), "Passivity-based Force Control of Medical Robots Interacting with Soft Tissues", HK$681,195, RGC GRF, 2012-2014.
  - Yunhui Liu (PI), "Adaptive visual servoing of unmanned water surface robots", HK$1,224,000, RGC GRF, 2011-2013.
  - Yunhui Liu (PI), "Fast Localization of Robots Using a Vision-Based Adaptive Estimator", HK$905,425, RGC, GRF, 2012-2015.
  - Yunhui Liu (PI) grant, "Vision-based flying control of small autonomous helicopters", HK$1,086,040, RGC GRF, 2008-2011.
  - Yunhui Liu (PI), et al., "Internet Robotics Innovation Park", HK$2,999,996, Innovation and Technology Fund, 2007-2009.
  - Yunhui Liu (PI), et al., "Hand-in-Hand: Feel your touch over the Internet", HK$1,100,000, Innovation and Technology Fund, 2009-2011.
  - Yunhui Liu (PI), et al., "Internet-based education for design and innovation", HK$1,750,000, Quality Education Fund, 2008-2010.
  - Yunhui Liu (PI) et al., "Innovation technology education via internet-based robotics competitions", HK$2,000,000, Quality Education Fund, 2007-2009.

Publications

Books

- Yunhui Liu and Dong Sun (eds.): Advancement in Biologically Inspired Robotics, CRC Press, 2011.

Journal Papers

- Y. H. Liu, H. Wang, W. Chen and D. Zhou, Adaptive Visual Servoing Using Common Image Features with Unknown Geometric Parameters, Automatica, 2013.
- T. K. Lau and Y. H. Liu, Inertial-based Localization For Unmanned Helicopters Against GNSS Outage, IEEE Transactions on Aerospace and Electronic Systems, 2013
- T. K. Lau and Y. H. Liu, Modeling of Cross-coupling Responses on Hingeless Helicopters via Gyroscopic effect, ASME Transactions Journal of Computational and Nonlinear Dynamics, 2011.
- H. Wang, Y. H. Liu, W. Chen and Z. Wang, A New Approach to Dynamic Eye-in-Hand Visual Tracking Using Nonlinear Observers, IEEE/ASME Transactions on Mechatronics vol.16, no.2, pp.387-394. 2011.
- H. Wang, Y. H. Liu and W. Chen, Uncalibrated visual tracking control without visual velocity, IEEE Trans. on Control Systems Technology, 18(6): 1359-1370, 2010.
- L. M . Fok, Y. H. Liu and W. J. Li, Prototyping of Beam Shaping Diffraction Gratings by AFM Nanoscale Patterning, IEEE Trans. on Automation Science and Engineering, 7(1):49-57, 2010.
- H. Wang, Y. H. Liu, and D. Zhou, Adaptive visual servoing using point and line features with an uncalibrated eye-in-hand camera, IEEE Trans. on Robotics, 24(4): 843-857, 2008.
- M. Li and Y. H. Liu, Dynamic modeling and experimental validation for interactive endodontic simulation, IEEE Trans. on Robotics, 23(3):443-458, 2007.
- H. Wang, Y. H. Liu and D. Zhou, Dynamic visual tracking for manipulators using an uncalibrated fixed camera, IEEE Trans. on Robotics, 23(3):610-617, 2007.
- Y.H. Liu, H. Wang, C. Wang and K. K. Lam, Uncalibrated visual servoing of robots using a depth-independent interaction matrix, IEEE Trans. on Robotics, 22(4):804-817, 2006.

Conference Papers

- K. Wang, Y. H. Liu and L. Y. Li, Vision-based Tracking Control of Nonholonomic Mobile Robots without Position Measurement, Proc. of IEEE Int. Conf. on Robotics and Automation, 2013.
- D. Navarron-Alarcon, Y. H. Liu, J. Romero and P. Li, Visually Servoed Deformation Control by Robot Manipulators, Proc. of IEEE Int. Conf. on Robotics and Automaiton, 2013.
- LAU Tak Kit and LIU Yunhui. "Stunt Driving via Policy Search". Proc. of 2012 IEEE International Conference on Robotics and Automation, p.4699-4704. 2012.
- LAU Tak Kit and LIU Yunhui. "Learning Hover with Scarce Samples". Proc. of 2012 IEEE International Conference on Robotics and Automation, p.4629-4635. 2012.
- LAU Tak Kit and LIU Yunhui. "The Importance of Variance Reduction in Policy Gradient Method". Proc. of 2012 American Control Conference, p.1376-1381, 2012.
- (LAU Tak Kit; LIU Yunhui and LIN, Kai Wun. "Evolutionary Tuning of Sigma-Point Kalman Filters", Proc. of 2011 IEEE International Conference on Robotics and Automation, pp. 771 - 776, 2011.
- WANG Hesheng; LIU Yunhui and CHEN Weidong. "Vision-based Robotic Tracking of Moving Object with Dynamic Uncertainty". Proc. of 2010 IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 2896 - 2901, 2010
- LAU, Tak Kit; LIU Yunhui and LIN, Kai Wun. "A Robust State Estimation Method Against GNSS Outage for Unmanned Miniature Helicopters", Proc. of 2010 IEEE International Conference on Robotics and Automation, organized by IEEE , p.1116-1122, 2010.

Honors & Awards

- Highly Cited Authors (Engineering) by Thomson Reuters, 2013
- Fellow of the Institute of Electrical and Electronic Engineers (IEEE), 2009
- Fellow of Hong Kong Institute of Engineering, 2012.
- The SUPCON Best Paper Award of 2010 World Congress on Intelligent Control and Automation (with Hesheng Wang), 2010.
- Science and Technology Progress Award (2nd class), Ministry of Education, China (with Han Ding and X. Y. Zhu), 2005
- Best Journal Paper Award from the Robotics Society of Japan (with Suguru Arimoto), 1994.
- Best Journal Paper Award from the Robotics Society of Japan (with K. Kitagaki, T. Suehiro, T. Ogasawara), 1998.
- Best Paper (1st place) Award at the 2003 IEEE Third Electro/Information Technology (with I. Elhajj, N. Xi and W. Fung), 2003.
- Outstanding paper award (3rd place) of the IEEE First Electro/Information Technology Conference (with I. Elhajj, N. Xi and W. Fung)
- Chang Jiang Scholar, Ministry of Education of China and Li K. S. Foundation, 2001.
- Best student papers by Ph.D. students at 2011 IEEE Int. Conf. on Robotics and Biomimetics (ROBIO 2011) (T. K. Lau), ROBIO 2006 (M. L. Lam), and 2007 IEEE Int. Conf. on Integration Technology (H. Wang).
- External Services
  - Editor-in-Chief, Robotics and Biomimetics, a new journal to be launched by Springer.
  - Editor, Advanced Robotics