

# **Curriculum Vitae**

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<http://www.ntu.edu.sg/home/elhxie>

## **Academic Qualifications:**

- Ph.D., The University of Newcastle, Australia, 1992.
- M.Eng., East China Institute of Technology (now Nanjing Univ. of Science and Technology), 1986.
- B.Eng., East China Institute of Technology (now Nanjing Univ. of Science and Technology), 1983.

## **Professional Qualifications/Memberships:**

- Fellow of Academy of Engineering Singapore, July 2020.
- Fellow of Chinese Automation Association, 2016.
- Fellow of IFAC, May 2011.
- Fellow of IEEE, January 2007.
- Elected Member of Board of Governors, IEEE Control Systems Society, Jan. 2016-Dec. 2018.
- Appointed Member of Board of Governors, IEEE Control Systems Society, 2011.
- Distinguished Lecturer, IEEE Control Systems Society, 2012-2014.
- Vide-President, Technical Committee of Control Theory and Applications, Chinese Academy of Sciences (中国自动化学会控制理论专业委员会副主任) since 2012.

## **Summary of Professional Experience:**

1 April 2021 – present: Director, Centre for Advanced Robotics Technology Innovation.  
1 March 2016 – present: Director, Delta-NTU Corporate Laboratory for Cyber-Physical Systems.  
November 2015 – present: Director, EEE-Delta Joint Lab on Internet of Things.

1 July 2011-June 2014:	Head, Division of Instrumentation and Control and Director, Centre for E-City, Nanyang Technological University.
Jan. 2008-30 June 2011:	Deputy Head, Division of Instrumentation and Control, Nanyang Technological University.
July 2011 – June 2013:	Director, EXQUISITUS, Centre for E-City, College of Engineering, Nanyang Technological University.
Jan. 2007- June 2011:	Director, Centre for Intelligent Machines, College of Engineering, Nanyang Technological University.
Jan. 2006 – Dec. 2011:	Changjiang Guest Professor, South China University of Technology
Oct. 2004 – present:	Professor, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore.
Jan. 1999 – Sept. 2004:	Associate Professor, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore.
Jan. 1997 - Dec. 1998:	Senior Lecturer, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore.
May 1992 - Dec. 1996:	Lecturer, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore.
Apr. 1986 - Jan. 1989:	Lecturer, Department of Automatic Control, Nanjing University of Science and Technology (former East China Institute of Technology), P.R. China.

### **Current Research Interests:**

- Networked control and multi-agent systems
- Distributed optimization
- Learning based control
- Smart sensing and localization
- Unmanned Aerial Vehicles and Ground Vehicles

### **Awards and Honors:**

- Best Student Paper Award at the 3<sup>rd</sup> IFAC Workshop on Cyber-Physical Human Systems (CPHS 2020) for the paper “Human-Centered Design for Safe Teleoperation of Connected Vehicles” (co-authored by F. Jiang, Y. Gao, and K.H. Johansson).
- Best Paper Award at 2020 IEEE The 11<sup>th</sup> International Symposium on Power Electronics for Distributed Generation Systems (PEDG2020) for the paper “Distributed Finite-time Power

Management for Hybrid Energy Storage Systems in DC Microgrids” (co-authored with Q. Xu and T. Dragicevic).

- Guan Zhao Zhi Award at the 39th Chinese Control Conference, Guangzhou, 27-29 July 2019, for the paper “Distributed Output Feedback Consensus of Uncertain Nonlinear Multi-Agent Systems With Limited Data Rate” (co-authored with M. Ran).
- Finalist for Best Paper Award at 2018 IEEE International Conference on Real-Time Computing and Robotics (IEEE RCAR 2018) for the paper “Distributed Continuous-Time Constrained Convex Optimization via Nonsmooth Analysis” (co-authored with X. Li and Y.G. Hong).
- Best Paper Award at 2017 IEEE International Conference on Unmanned Systems (IEEE ICUS 2017), Beijing, Oct. 2017 for the paper “Infrastructure-free cooperative relative localization for mobile unmanned aerial vehicles in GPS-denied environments” (co-authored with K. Guo).
- Best Paper Award at the 18<sup>th</sup> International Conference on Advanced Robotics (ICAR 2017), Hong Kong, July 2017 for the paper “Non-Iterative SLAM” (co-authored with C. Wang and J. Yuan).
- Highly Cited Researcher by Clarivate Analytics (<https://clarivate.com/hcr/researchers-list>) in 2017.
- Highly Cited Researcher by Academic Ranking of World Universities (<http://www.shanghairanking.com/>) and Thomson Reuters in 2016.
- Highly Cited Researcher by Academic Ranking of World Universities (<http://www.shanghairanking.com/>) and Thomson Reuters in 2015.
- Highly Cited Researcher by Academic Ranking of World Universities (<http://www.shanghairanking.com/>) and Thomson Reuters, 2014.
- Microsoft Indoor Localization Competition Award, 3<sup>rd</sup> Place (Infrastructure-free Approaches): WiFi-based Indoor Localization System by Using Weighted Path Loss and Extreme Learning Machine, The 13<sup>th</sup> ACM/IEEE Int. Conf. on Information Processing in Sensor Networks (IPSN), Berlin, April 2014.
- Guan Zhao Zhi Award at the 29th Chinese Control Conference for the paper “Mean Square Stabilizability of Linear Systems with Limited Feedback Data Rates and Markovian Packet Losses,” (co-authored with K. You), July 2010.
- Best Paper Award for the paper “Distributed consensus of multi-agent systems with finite-level quantization” (co-authored with T. Li, M. Fu and J. Zhang) at the 7<sup>th</sup> Asia Control Conference, Hong Kong, August 26-28, 2009.
- Best Student Paper Award for the paper “Optimal Filtering for Continuous-time Linear Systems with Time-varying Delay” (by W. Wang, H. Zhang and L. Xie) at the 6<sup>th</sup> Int. Conf. on Information, Communications, and Signal Processing, December 10-13, 2007, Singapore.
- Elected to Fellow of IEEE in Jan. 2007.
- Best Theoretical Paper Award for the paper “Robust Kalman filtering for discrete-time systems with measurement delay” (co-authored with X. Lu, H. Zhang and W. Wang) at the 6<sup>th</sup> World Congress of Intelligent Control and Automation, China, June 21-23, 2006.
- Changjiang Scholar award, Ministry of Education, P.R. China, 2006.

- Elected to Fellow of Institution of Engineers, Singapore in 2005.
- Occupational Health Best Practices Award (Excellence and Innovation), Ministry of Manpower, Republic of Singapore, for the project “Intelligent Monitoring and Control System for Hazardous Chemical Waste Treatment,” Oct. 2004.
- Science and Technology Award, second prize, by Ministry of Mechanical Industries, P.R. China, 1987.
- Nominated for EEE Teaching Award, 2005.

## **Publicities:**

- IEEE Spectrum (June 2021) reported our GarbageNet: <https://spectrum.ieee.org/tech-talk/artificial-intelligence/machine-learning/ai-proves-trash-sorter-extraordinaire>
- Unmanned Solutions (with ST Eng), Singapore Airshow, 16-19 Feb. 2016.
- 16 UAV Light Show at the Garden-By-the Bay on 8, 9, 15, 16 January 2016, featured by Straits-Time, Lian He Zao Bao and Channels 5 and 8.
- UAV demos at Singapore Airshow 2014 (11-16 Feb 2014):

The Straits Times (Page B6, 8 Feb 2014): <http://www.straitstimes.com/breaking-news/singapore/story/ntu-built-drones-fly-singapore-airshow-20140208>

Lian He Zao Bao: 10 Feb 2014

[http://www.razor.tv/section/53581/news?movideo\\_p=53581&movideo\\_m=717644](http://www.razor.tv/section/53581/news?movideo_p=53581&movideo_m=717644)

Channel News Asia: 12 Feb 2014: <http://www.channelnewsasia.com/news/video/s-pore-researchers-hope/995458.html>

YouTube video, (<http://youtu.be/9-4CIHx8WGc> )

## **Editor/Associate Editorship:**

- Editor-in-Chief, Unmanned Systems since 2012.
- Associate Editor, IEEE Transactions on Control of Network Systems, since July 2016.
- Associate Editor, Sciences-in-China, Informatics, July 2015.
- Editor, IET Book Series on Control, Jan 2010 – Dec. 2015.
- Editor-at-Large, Journal of Control Theory and Applications, since January 2009.
- Associate Editor, IEEE Transactions on Control Systems Technology, Jan. 2009 – Dec. 2015.
- Guest Editor, Journal of Control Theory and Applications, 2008.
- Associate editor, The Transactions of the Institute of Measurement and Control, 2007-Dec 2011.
- Member of Editorial Board, IET-Control Theory and Applications, Jan. 2007-Dec. 2009.
- Associate Editor, Automatica, Oct. 2006 – Sept. 2009.

- Associate Editor, IEEE Transactions on Circuit and Systems-II, Jan. 2006 – Dec. 2007.
- Member of Editorial Board, IEE Proceedings on Control Theory and Applications, 2005-2006.
- Associate Editor, IEEE Transactions on Automatic Control, Jan. 2005 – Dec. 2007.
- Associate Editor, International Journal of Control, Automation and Systems, Jan. 2004 – Dec. 2006.
- Associate Editor, Journal of Control Theory and Applications, since January 2004-2008.
- Associate Editor, Conference Editorial Board, IEEE Control Systems Society, 2000 – 2004.
- Associate Editor, ECC-CDC'05.
- Member, IFAC Technical Committee on Linear Systems, 2003-present.

### **Chairmanship of Conference Organizing Committees:**

- General Chair, 62<sup>nd</sup> IEEE Conference on Decision and Control, Singapore, 2023.
- General Chair, 15<sup>th</sup> IEEE Int. Conference on Control and Automation, Edinburgh, Scotland, July 16-19, 2019.
- Finance Chair, 14<sup>th</sup> IEEE Int. Conference on Control and Automation, Alaska, USA, July 12-15, 2018.
- General Chair, 13<sup>th</sup> IEEE Int. Conference on Control and Automation, Ohrid, Macedonia, July 3-6, 2017.
- Member, International Program Committee, 6th IFAC Symposium on System Structure and Control, in Istanbul, Turkey from June 22 – 24, 2016.
- Publicity Chair, ACM/IEEE 5th International Conference on Cyber-Physical Systems, Berlin, Germany, April 14-17, 2014.
- Vice Program Chair, the 55<sup>th</sup> IEEE Conference on Decision and Control (CDC), December 2015, Osaka, Japan.
- Member of Best Student Paper Award Committee, the 53<sup>rd</sup> IEEE Conference on Decision and Control (CDC), 10-12 December 2013, Florence, Italy.
- Member of Technical Program Committee, 16<sup>th</sup> International Conference on Information FUSION, Istanbul, Turkey, 9-12 July 2013.
- Award committee co-chair, the 15<sup>th</sup> International Conference on Information Fusion (FUSION 2012), July 9-12, Singapore.
- Associate Editor at Large, The 51st IEEE Conference on Decision and Control (CDC), 10-13 December 2012, Maui, Hawaii.
- General Co-Chair, The 9<sup>th</sup> World Congress on Intelligent Control and Automation, Beijing, July 2012.
- General Chair, 7<sup>th</sup> IEEE Int. Conference on Control and Automation, Christchurch, New Zealand, Dec. 2009.
- Registration Co-Chair, the 48<sup>th</sup> IEEE Conference on Decision and Control, Shanghai, Dec. 2009.
- Tutorials/Workshops Co-Chair, 2008 IEEE International Conference on Mechatronics and

Automation, ICMA2008 Takamatsu, Japan on 5-8, August, 2008.

- General Chair, 9<sup>th</sup> International Conference on Control, Automation, Robotics and Vision, Singapore, Dec. 5-8, 2006.
- Program Co-Chair, The fifth IEEE International Conference on Control and Automation, Budapest, June 26-29, 2005.
- Program Chair, The 8<sup>th</sup> International Conference on Control, Automation, Robotics and Vision (ICARCV), Dec. 6-9, 2004, Kunming, China.
- Program Chair, The fourth IEEE International Conference on Control and Automation, Montreal, Canada, June 10-12, 2003.
- General Co-Chair, The 2002 International Conference on Control and Automation, Xiamen, China, June 16-19, 2002.

### **Keynote Speeches and Panel Member:**

- Plenary Forum Talk, “Perception and Localization of Unmanned Systems in Complex Environment,” World Artificial Intelligence Conference – Forum for New Generation of Intelligent Unmanned Systems and Its Applications, Shanghai, 10 July 2021 (online).
- Keynote talk (online), “Localization and Navigation of Unmanned Systems,” 2021 6th Asia-Pacific Conference on Intelligent Robot Systems (ACIRS 2021), Tokyo, Japan, 16-18 July 2021.
- Keynote talk (online), “Localization and Navigation of Unmanned Systems,” Smart Manufacturing in 5G Era, 2021 Global Artificial Intelligent Technology Conference (GAITC), Hangzhou, China, 5-6 June 2021.
- Keynote talk, “Reinforcement Learning Based Control of Uncertain Nonlinear Systems,” 2021 International Workshop on Intelligent Energy and Optimal Control, Shandong University, 15-17 Jan. 2021.
- Panel Talk “Integrative Localization and Control for Unmanned Systems” in the plenary panel on Control Theory and Application: The Presence and the Future at The 16th International Conference on Control, Automation, Robotics and Vision, Shenzhen, 13-15 Dec 2020.
- Online Distinguished Lecture, “Localization and Navigation of Unmanned Systems,” Peking University, China, 8 Dec. 2020.
- Online Keynote Talk, “Reinforcement Learning Based Control of Uncertain Nonlinear Systems,” China University of Geosciences, 26 Nov 2020.
- Panel Talk “WiFi-based Indoor Positioning System and Smart Sensing”, Unlocking Innovation, Infocomm Media Development Authority of Singapore and NTUitive, 2 Dec. 2020.
- Distinguished Lecture, “Localization and Navigation of Unmanned Systems,” 2nd International Forum on Frontiers of Automation and Artificial Intelligence, Shenyang, China, October 22-23, 2020.
- Keynote speech, “Localization in GPS Denied Environment”, 2020 3rd International Conference on Electronics and Electrical Engineering Technology (EET 2020), Japan, Oct 16-18, 2020.

- Keynote speech, “Localization and Control of Unmanned Systems in GPS Denied Environment,” The 6<sup>th</sup> IEEE International Conference on Control, Automation and Robotics, Singapore, 20-23 April 2020.
- Keynote speech, “Localization and Control of Unmanned Systems,” Guidance and Control Technical Committee Annual Meeting, Chinese Automation Association, 22 Nov 2019.
- Panelist, The 9<sup>th</sup> IEEE International Conference on Cybernetics and Intelligent Systems (CIS) and the 9<sup>th</sup> IEEE International Conference on Robotics, Automation, and Mechatronics (RAM), Bangkok, 18-20 July 2019.
- Plenary Talk, “Localization and Control of Unmanned Systems in GPS Denied Environment,” The 11<sup>th</sup> IEEE International Conference on Advanced Infocomm Technology, Jinan, 18-20 Oct 2019.
- Keynote Speech, “Docking and Formation Control in GPS Denied Environment,” 2019 IEEE International Conference on Unmanned Systems (ICUS 2019), Beijing, 17-19 Oct 2019.
- Plenary lecture, “CPS Enabled Smart Manufacturing,” Annual Forum of Technical Committee of Cyber-Physical Systems, Chinese Automation Association, Nanchang, China, 2 June 2019.
- Panelist, “Trend of Unmanned Systems R&D and Industrial Applications,” the 37<sup>th</sup> Chinese Control Conference, Wuhan, 25-27 July, 2018.
- Plenary Talk, “Cooperative Localization and Control of Multi-agent Systems,” The 13th World Congress on Intelligent Control and Automation (WCICA 2018), Changsha, 4-8 July 2018.
- Keynote speech, “Cooperative localization and control of multi-robot systems,” The IEEE Int. Conf. on Advanced Robotics and Mechatronics (ICARM), July 18-20, 2018, Singapore.
- Keynote speech, “Stochastic channel allocation for networked control systems,” The 2<sup>nd</sup> Symposium of Chinese Nonlinear Systems and Control, Fuzhou, China, Nov. 16-18, 2017.
- Keynote speech, “Indoor Positioning in the View of IoT,” Chinese Automation Congress, Jinan, 20-22 Oct. 2017.
- Keynote speech, “Indoor Positioning Systems: Some Recent Development and Challenges”, The 8th International Conference on Extreme Learning Machines (ELM2017), Yantai, China, October 4 - 7, 2017.
- Invited Plenary Lecture, “Existence, Convergence and Efficiency Analysis of Nash Equilibrium and Its Application to Traffic Networks,” 6<sup>th</sup> IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys 2016), Tokyo, Japan, Sept. 8-9, 2016.
- Keynote speech, “Cooperative Localization of Micro UAVs in GPS Denied Environments,” 12th International Conference on Intelligent Unmanned Systems (ICIUS2016), Xian, China, 23-25 August 2016.
- Keynote speech, “Indoor localization in the view of Internet of Things,” IEEE Tenth International Conference on Intelligent Sensors, Sensor Networks and Information Processing, Singapore 7-9 April 2015.
- Keynote speech, “Gridless sparse methods for direction of arrival (DOA) estimation: within and beyond compressed sensing,” 2015 International Conference on Estimation, Detection and Information Fusion (ICEDIF) will be held in Harbin, China on 10-11 Jan 2015.

- Keynote speaker, “Distributed Information Processing and Control of Multi-agent Networks,” IASTED International Conference on Engineering and Applied Science, December 27 – 29, 2012, Colombo, Sri Lanka.
- Keynote speech at The 2012 IEEE International Conference on Cyber Technology in Automation, Control, and Intelligent Systems (IEEE-CYBER 2012), Bang Kok, Thailand, May 27-29, 2012.
- Keynote speech, “Communication Constrained Distributed Multi-agent Cooperation” International Conference on Global Technology Initiatives,” Mumbai, India, March 27-29, 2012.
- Plenary speech “Control over Communication Networks – Trends and Challenges,” 30<sup>th</sup> Chinese Control Conference, Yantai, July 22-24, 2011.
- “Networked Multi-agent Cooperation: Recent Developments and Challenges,” 2nd International High Speed Intelligent Communication (HSIC) Forum,” Singapore, May 13-14, 2010.
- Panelist, “How to Publish High Quality Papers,” WCICA2010, Jinan, China, 7 July 2010.
- “Network topology and communication data rate for consensusability of multi-agent systems,” 9th International Symposium on Frontier Problems in Systems and Control, Beijing, 24 May 2010.
- “Wireless Sensor Networks,” 1st International High Speed Intelligent Communication Forum, Taoyuan, Taiwan, 20-22 April 2008.
- Panelist on “Control of Complex Systems,” 10<sup>th</sup> Int. Conf. on Control, Automation, Robotics, and Vision (ICARCV 08), Hanoi, 17-20 Dec. 2008.
- Panelist on “How to Conduct Scientific Research,” 3rd Int. Conf. on Computer Science and Education, Kaifeng, China, 25-27 July, 2008.
- Panelist, “Control Education and Research in the 21<sup>st</sup> Century,” the 27<sup>th</sup> Chinese Control Conference, Kunming, China, July 2008.
- Panelist, “Advances on Networked Control Systems,” Int. Workshop on Control Theory, Sanya, China, 16-19 January 2008.
- “Resource-constrained Information Processing in Wireless Sensor Networks,” 2008 Chinese Control and Decision Conference, 2-4 July 2008, Yantai, China.
- “Collaborative Information Processing in Wireless Sensor Networks,” 2<sup>nd</sup> Int. Conf. on Intelligent Information Management Systems and Technology, Yantai, China, Oct. 20-22, 2007.

### **Invited Short Courses:**

- Short course on Analysis and Design of Networked Control Systems at 29<sup>th</sup> Chinese Control Conference, Beijing, 28 July 2010.
- Short course on “Sensor Networks and Networked Systems,” Nanjing University of Science and Technology, 29 May 2009.
- Short course on “Quantized Control and Estimation,” Navy University of Engineering, Wuhan, China, 18 Oct. 2008.
- Short course on “Wireless Sensor Networks,” Xiamen University, 21 July 2008.



## Invited Talks:

- Reinforcement Learning Based Control of Uncertain Nonlinear Systems, The International Academic Forum on Process Control and Optimization, China University of Petroleum, 16-17 July 2021.
- Localization and Control of Unmanned Systems, Tsinghua University, 1 March 2021.
- Efficient Reinforcement Learning Based Control of Uncertain Nonlinear Systems, Chongqing University, 27 Jan 2021.
- Efficient Reinforcement Learning Based Control of Uncertain Nonlinear Systems, BUAA Hangzhou Research Institute, 14 Jan 2021.
- Online Distinguished Lecture, “Localization and Navigation of Unmanned Systems,” Peking University, China, 8 Dec. 2020.
- Online Distinguished Lecture, “Localization and Navigation of Unmanned Systems,” Shanghai University, China, Nov 2020.
- Online Distinguished Lecture, “Localization and Navigation of Unmanned Systems,” Shanghai University, China, Nov 2020.
- Distance and Odometry Based Similar Station Keeping and Similar Formation Control, The 2<sup>nd</sup> Optimization and Control Theory and Network Control Application Symposium, Taian, China, 18-20 Oct 2019.
- Distributed Consensus Optimization from a Control Perspective, Pre-conference Workshop at the 39<sup>th</sup> Chinese Control Conference, Guangzhou, July 27-29, 2019.
- Docking and Formation Control of Unmanned Systems in GPS Denied Environment, 2019 TCCT Workshop on Cooperative Control and Multi-agent Systems, Tongji University, 1-3 August 2019.
- Data rate for Distributed Consensus: from Linear to Nonlinear, Workshop in honor of Professor David Hill’s 70<sup>th</sup> Birthday, Nanchang, China, 2 June 2019.
- Docking and Formation in GPS Denied Environment, The 9<sup>th</sup> International High-end Forum on Control Science, Jinan, China, 4 June 2019.
- Distributed Consensus Optimization: A Control Perspective, 2019 Workshop on Nonlinear and Distributed Control and Optimization, Nanchang, China, 6 June 2019.
- Docking and Formation in GPS Denied Environment, The 3<sup>rd</sup> International Symposium on Autonomous Systems (ISAS 2019), Shanghai, 29-31 May 2019.
- Distributed Optimization from Control Perspective, East China Normal University, 2 Jan. 2019.
- Distributed Optimization from Control Perspective, Shandong University, 26 Dec. 2018.
- Overview of Research on Cooperative Localization and Control, Beihang University, 25 Dec. 2018.
- Localization and Control in GPS Denied Environments, Int. Workshop on Advanced Control and Intelligent Automation for Complex Systems, Wuhan, China, 17-18 March 2018.
- Distributed Gradient Methods for Multi-agent Optimization, Royal Institute of Technology (KTH),

Sweden.

- Asynchronous Distributed Gradient Methods for Multi-agent Optimization, Hanzhou, 19 Oct. 2017.
- Existence, Convergence and Efficiency Analysis of Nash Equilibrium and Its Application to Traffic Networks, Invited Lecture at 2017 Winter School on Intelligent Transportation, IEEE CSS, Singapore, Jan. 2017.
- Cooperative localization of UAVs in GPS denied environments, South China University of Technology, Dec. 2016.
- Cooperative localization and control of robotic networks, Shanghai Jiaotong University, Dec. 2016.
- Synchronization of the delayed Vicsek model, Guangdong University of Technology, Dec. 2016.
- Asynchronous distributed gradient method for multi-agent optimization, Workshop on Complex Systems and Control, Shandong University, 3-4 Dec 2016.
- Synchronization of the delayed Vicsek model, Int. Workshop on Frontiers in Control Sciences, Chinese Academics of Sciences, Beijing, 2 Dec 2016.
- Indoor Localization in the View of Internet of Things, Okayama Prefectural University, Japan, 14 Dec. 2015.
- Distributed Constrained Optimization, South China University of Technology, 18 Dec. 2015.
- Distributed Constrained Optimal Consensus of Multi-agent Systems, Chinese University of Hong Kong, 18 November 2015.
- Distributed Consensus of Multi-agent Systems over Fading Networks, City University of Hong Kong, 11 July 2015.
- Distributed Optimal Consensus, Shandong University, July 2015.
- Network Topology and Communication Data Rate for Multi-agent Consensus, IEEE Distinguished Lecture, Chinese University of Hong Kong, 24 Feb. 2014.
- Network Topology and Communication Data Rate for Consensusability of Multi-agent Systems, IEEE Distinguished Lecture, Huazhong University of Science and Technology, 7 May 2013.
- Compressed sensing and its applications in signal processing and control, Chinese Academy of Sciences, 24 July 2013.
- Distributed quantized consensus of multi-agent systems, Int. Workshop on Multi-agent Systems, Beijing Institute of Technology, 22-23 July, 2013.
- Networked Control: Some recent development and challenges, East China University of Science and Technology, 30 May 2013.
- Track-following control of four-bar structured HDD via parameter-dependent pre-compensation, Asia Pacific Magnetic Recording Conference (APMRC), Singapore, 31 Oct-2 Nov 2012.
- Synchronization of multi-agent systems with delayed inputs from neighbors, Chinese Academy of Sciences, Workshop on Cooperative Estimation and Control over Networks, 3 July 2012.
- Communication-constrained multi-agent cooperation, IEEE Distinguished Lecture, East China University of Science and Technology, 27 June, 2012.
- Communication-constrained multi-agent cooperation, IEEE Distinguished Lecture, Nanjing

University of Science and Technology, 28 June, 2012.

- Communication-constrained multi-agent cooperation, IEEE Distinguished Lecture, Shandong University, 29 June, 2012.
- Multi-agent Synchronization vs. Network Topology, Int. Workshop on Modeling, Analysis and Control of Cyber-Physical Systems, Hong Kong University of Science and Technology, June 12-13, 2012.
- Networked control research – challenges and opportunities, Forum on Strategic Directions of Control Research, Peking University, Sept 24- 25, 2011.
- Synchronization of Multi-Agent Systems with Delayed Control Input Information from Neighbors, Int. Workshop on Advanced Control, Nanjing University of Science and Technology, July 27-28, 2011.
- Stability of Kalman filter with Markovian packet losses, Int. Workshop on Networked and Nonlinear Control, Shandong University, March 2011.
- Cooperative localization and control, Nanjing University of Science and Technology, 1 Dec 2016.
- Cooperative control of multi-agent systems, Beijing Jiaotong University, 28 July 2010.
- Network Topology and Communication Data Rate for Consensusability of Multi-agent Systems, Zhejiang University, 26 July 2010.
- Minimal data rate and minimal channel capacity for stabilization, Harbin Institute of Technology, 15 July 2010.
- Multi-agent systems: network topology and communication data rate, Northeastern University, 13 July 2010.
- Necessary and sufficient conditions on network topology for multi-agent consensus, Int. Workshop on Networked Control and Nonlinear Systems, Taishan, 11 July 2010.
- Network Topology and Communication Data Rate for Consensusability of Multi-agent Systems, 9<sup>th</sup> Symposium on Frontier Problems in Systems and Control, Chinese Academy of Science, May 25, 2010.
- Minimum Data Rate and Channel Capacity for Stabilization of Linear Systems over Lossy Networks, Int. Workshop on Networked Control, Shenzhen, China, 21 Dec. 2009.
- Cooperative Distributed Control of Networked Systems, Linköping University, 23 November 2009.
- Information-Constrained Control and Distributed Consensus, Temasek Lab, NUS, 7 Oct. 2009.
- Information-Constrained Estimation and Control, NTU-Linköping University Workshop, NTU, 9 Sept. 2009.
- Distributed control, Tongji University, 26 May, 2009
- Cooperative control of multi-vehicle systems, Chang Gung University, Taiwan, 21 April 2009.
- Cooperative Distributed Information Processing and Control for Networked Systems, Defense Science Organization, Singapore, March 11, 2009.
- Collaborative Information Processing in Wireless Sensor Networks, Navy University of Engineering, Wuhan, China, 17 Oct. 2008.

- Quantized Control and Estimation, Navy University of Engineering, Wuhan, China, 18 Oct. 2008.
- Quantized estimation, University of California at Los Angeles, 30 May 2008.
- Estimation over networked systems, California Institute of Technology, 22 May 2008.
- Quantized estimation and control, Int. Workshop on Control Theory, Sanya, China, 16-19 January 2008.
- Distributed sensing and information processing in wireless sensor networks, Beijing Institute of Technology, 14 January 2008.
- Quantized Kalman filtering, Shanghai Jiaotong University, December 29, 2007.
- Distributed estimation and control in wireless sensor networks, Zhejiang University, December 27, 2007.
- Peak covariance stability of a random Riccati equation arising from Kalman filtering with observation losses, International Conference on Frontier Problems in Systems and Control on the Occasion of Prof Han-Fu Chen's 70<sup>th</sup> Birthday, Chinese Academy of Science, April 8, 2007.
- Collaborative information processing in wireless sensor networks, Beijing University of Posts and Telecommunications, Jan 3, 2007.
- Quantized feedback control, Beihang University, Jan 4, 2007.
- Collaborative information processing in wireless sensor networks, Shandong University, Jan 6, 2007.
- Collaborative information processing in wireless sensor networks, Sun Yat-Sen University, Jan 11, 2007.
- Linear quadratic regulation of systems with multiple input delays, South China University of Technology, Jan 12, 2007.
- Challenges in Control Engineering Education, Symposium organized by Automation Education Committee, People's Republic of China, 11-13 August 2006.
- Wireless sensor networks and applications, South China University of Technology, 14 June 2006.
- H-infinity full information control of systems with multiple input delays, University of Manchester, UK, 9 December 2005.
- On quantized feedback control, Nanjing University of Science and Technology, July 2005.
- Linear quadratic regulation of systems with multiple input delays, Chinese University of Hong Kong, April 2005.
- Mixed H<sub>2</sub>/H-infinity control with application to disk drive servo systems, Joint Hong Kong and HIT Workshop on Trends of Automation Science and Engineering, 20 March 2004.
- Stabilization of linear systems via quantized feedback, Osaka University, Japan, 11 March 2004.
- Robust H<sub>2</sub> filtering of uncertain time-delay systems, University of Hong Kong, December 2002.
- Recent development in control and estimation of time-delay systems, Nanjing University of Science and Technology, China, December 2002.
- Optimal and multi-objective design of filter bank, City University of Hong Kong, December 2002.
- Robust estimation of time-delay systems, Dalian University of Science and Technology, December

2002.

- Optimal filter bank design with applications in signal processing and communications, Hong Kong Polytechnic University, December 2002.
- Joint Optimization Approach to Optimal Coding and Design of Filter Bank, Workshop on Control and Estimation Techniques in Signal Processing and Communications, Singapore, July 2002.
- Active noise control, Fuzhou University, June 2002.
- Periodic systems analysis and design with application to signal processing, Shanghai Jiaotong University, June 2001.
- Optimal deconvolution of periodic channels, Xian Jiaotong University, August 2001.
- Short course “Advanced Control Systems Design and Applications”, Port Authority of Singapore, 6 Sept. 1999 to 9 Sept. 1999.
- H-infinity deconvolution estimation: A Krein space polynomial system approach, Sydney University, April 1999.
- A unified approach to H-infinity filtering, prediction and smoothing, The University of Newcastle, April 1999.
- Robust estimation of dynamical systems, Joint Workshop, Singapore, 1999.

### **Research Grants (Programme PI: \$75.3M; PI: \$15.3M; Co-PI: \$14.5M):**

- NRF Medium Sized Centre for Advanced Robotics Technology Innovation (CARTIN), Lead PI, \$24,440,000, 30 March 2021-30 March 2026.
- WiFi-based Vital Sign Sensing, PI, \$87,600, Panasonic R&D Centre Singapore, Feb. 2021-Nov. 2021.
- Robust Flight Control for High Capacity VTOL UAV, PI, \$249,500, STE-NTU Corp Lab, April 2020 – March 2021.
- Seamless Navigation for the Blind and Visually Impaired, PI, \$783,000, Tote Board, July 2020 – June 2021.
- Efficient and Precision Docking for AGVs in Dynamic Environments, PI, \$555,000.00, Delta-NTU Corp Lab, Jan. 2020 – 31 Dec. 2021.
- Asynchronous Distributed Online Optimization over Multi-agent Networks with Limited Information Exchange, PI, \$120,000, MoE Tier 1- 2019-T1-001-088 (RG72/19), Nov 2019 – Oct 2021.
- Drone Inspection System for Building Façade, PI, \$639,570, NRF, 18 Feb 2019-2 August 2021.
- UAV Localization and Safe Navigation around Container Cranes during Inspection, PI, \$774,000, NRF STE-NTU Corporate Lab, Sept. 2018 – 31 March 2021.
- Industrial Internet of Things – Control Network Security, ASTAR, \$439,200, PI, 1 Sept. 2017 – 30 April 2021.

- Scalable Multi-Robot Sensor Fusion, Localization, Navigation and Control, Joint WASP/NTU Research Grant, \$270,000, Co-PI (allocated amount of \$135,000), 1 March 2018 - 28 Feb. 2021.
- NTU-Delta Corporate Laboratory for Cyber-Physical Systems, NRF, 1 July 2016-30 June 2021, \$45,000,000, Director.
- Development of Dynamic Reconfigurable Material Handling System, NRF-Delta, \$2,186,100, PI, 1 July 2016 – 30 June 2021.
- Obstacle detection and avoidance in GPSless Environment, PI, \$145,000, NRF STE-NTU Corporate Lab, July 2016 to June 2018.
- Continuous Dictionary Compressed Sensing with Applications, 2015-T1-001-198, AcRF Tier 1, \$169,600.00, PI, 2 Nov. 2015- 1 Nov. 2017.
- GPSless Localization for Unmanned Aerial Vehicles With Self-Organized Distributed Coverage of 3D Structures, PI, \$570,000, NRF STE-NTU Corporate Lab, July 2015 to June 2020.
- Compressed Sensing for Passive Radar, MINDEF, TL-9014103349-01, PI, \$375,000, April 2015 to Oct. 2016.
- Distributed Model Predictive Routing and Scheduling for Minimizing Network-wise En-Route and Airport Arrival Delay in Air Traffic Flow Management with an Eulerian-Lagrangian Flow Dynamic Model, Co-PI, ATMRI, \$588,500, April 2015 to April 2018.
- Cognitive team theoretic approach for Dynamic Airspace Management (CDAM), Co-PI, ATMRI, \$588,000, April 2015 to April 2018.
- Cognitive team theoretic approach for Dynamic Airspace Management (CDAM), Co-PI, \$172,000, April 2015 to April 2018.
- Framework Agreement for Multiple Projects in the Area of Internet of Things, PI, \$2,840,800, EEE-Delta Joint Lab, Nov. 2014 to Nov. 2019.
- Hub-wide Grid Planning and Management System for Industrial Hubs, Co-PI, EIRP, \$2,710,500, June 2014 to June 2017.
- Integrated Fibre Optic Sensor Based Monitoring System for LNG Terminals, NRF2014EWT-EIRP003-014, Co-PI, \$2,667,600.00, July 2015 to June 2018.
- Topological Analysis & Control Design for Heterogeneous Multi-agent Systems, Australian Research Council (ARC), A\$355100, 2015-2017, Partner Investigator.
- GRUIDAE Multi-UAV Demonstration, POD0001476, PI, \$360,000, MINDEF-TL@NUS, Dec. 2014 to Dec. 2015.
- A Real-time Indoor Positioning and Navigation System, NRF/NTUitive, \$10,000, PI, Oct. 2014 to Apr. 2015.
- Development of Collaborative Localization and Swarming Technologies for Micro UAVs, TL@NTU, \$80,000, PI, Oct. 2014 – Sep. 2015.
- Fruitdove Rendezvous, TL@NUS (Project from MINDEF), \$180,000, PI, Apr. 2014 to Mar. 2016.
- Adaptive Occupancy based Localized Cooling Control of ACMV Systems, NRF2013EWT-EIRP004-012, \$912,600, PI, 1 August 2014 – 31 July 2017.

- Wireless networked sensing for prognosis in power electronics and electrical machines, Rolls-Royce@NTU Corporate Lab, \$623,405, PI, 1 August 2013 – 31 July 2018.
- CRANEV, MINDEF POD0713727, \$3m, Co-PI, Feb 2014 to Jan. 2016.
- Fusion and Sense Making of Heterogeneous Sensor Network and Other Sources, Co-PI, \$195,925, Mar. 2013 to Sept. 2016.
- Model Predictive Based Control and Navigation for Robots, CTRLWORKS Pte Ltd., \$40,000, PI, March. 2103- Dec 2013.
- New Generation HVAC Systems - Total Energy Efficiency Solutions, National Research Foundation, Competitive Research Programme, \$9.95m , one of the six Project PIs, August 2012- July 2017.
- Networked Control Systems in Industrial Automation, EDB IPP-Pteris Global Pte Ltd, \$360,000, PI, Feb. 2012 - Jan. 2016.
- Singapore Berkeley Smart Buildings: Building Efficiency and Sustainability in the Tropics (SinBerBEST), Lead PI of Multi-level Control Thrust (with total funding of over \$10m), Feb. 2012- Jan. 2017.
- Distributed Cooperative Estimation over Complex Temporal and Spatial Networks, NSFC, 61120106011, RMB 2.6m, 1 Jan. 2012 – 31 Dec. 2016, Co-PI.
- Geolocation and Tracking with Networked Multi-Sensor Platforms, DIRP, POD0713727, \$365,297.50, PI, June 2011-May 2014.
- Automated Assessment System for Physical Rehabilitation, Innovative Fund, Ministry of Education, MOE2010-IF-1-005, \$518,265, Co-PI, April 2011 – March. 2014.
- Dynamic Road Pricing for Traffic Congestion Control, Singapore-MIT Centre for Research and Technology, 5 years program (Sept. 2010-Aug. 2015), \$141,600 for year 1, PI.
- Integrative Approach for Controller Design for Optimal Performance, A\*STAR SERC 092 156 0126, Mar. 2010 – Feb. 2013, PI, \$362,530.33.
- Distributed-Cooperative Information Processing and Control, POD0914267, Temasek Labs, PI, August 2009 to Feb 2013, \$482,150.00 (Cash \$215,050.00).
- Novel Roof-mounted Solar Energy Assisted Double Cycle Refrigeration for Energy Efficient Building Air-conditioning Systems, NRF2008EWT-CERP02-010, Co-PI, May 2009 – April 2012, S\$ 1,039,935.
- Investigation of Network-constrained Estimation Algorithms for Network-Centric Environments, MINDEF-NTU, POD0613315, PI, July 2009-June 2010, \$50,000.
- Intelligent Fiber-Bragg Grating Sensor Network for Aircraft Structural Health Monitoring and Diagnosis, A\*Star SERC Aerospace Consortium Project 2, Collaborator, Feb 2009 – Jan 2012, \$878,895.
- Real-time Secure RFID-based Track and Trace in Aerospace MRO Supply Chain, A\*Star SERC Aerospace Consortium Project 3, Collaborator, Feb 2009 – Jan 2011, \$523,745.
- Cooperative Estimation and Control Theory with Application in Wireless Sensor Networks, NSFC,

China, 60828006, PI, Jan. 2009-Dec. 2010, RMB200,000.

- A Dynamical System Approach to the Analysis of Scattered Pulse-Tissue Interactions in Medical Ultrasound, MoE Tier 2, PI, May 2008 – April 2011, \$643,770.
- Modeling, control and optimization for complex sensor and control networks (U0735003), NSF of China, collaborator, Jan. 2008-Dec. 2010, RMB1.4m.
- Integrative Serviceability Management and Supervisory Control of Networked Manufacturing Systems for Virtual Enterprises (P0520104), Co-PI, April 2006 – March 2009, \$982,190.
- Markov Jump System Theory for Collaborative Signal and Information Processing in Wireless Sensor Networks, A\*STAR (SERC Grant no. 052 101 0037), PI, Jan. 2006-Dec. 2008, \$510,439.
- Soft Intelligent Sensors and Its Applications in Magnetic Data Storage Systems, A\*STAR (SERC Grant no. 052 101 0036), Co-PI, Jan. 2006 – Dec. 2008, \$527,840.
- Collaborative Signal Processing and Control in Wireless Sensor Networks, AcRF (RG12/05), PI, Dec. 2005 – Nov 2008, \$85,043.20.
- Distributed Information Processing for Wireless Sensor Network, RGM 19/05, Feb. 2006, Aug. 2009, PI, \$80,000.
- Soft-Sensing Technologies with Application to Chemical Waste Treatment, EDB/Purechem Pte Ltd/NTU, PI, 2004 -2007, \$498,000.
- Analysis and synthesis of two-dimensional systems for signal processing and control Australian Research Council (Partner Chief Investigator), 2001-2004, A\$163,000.
- Robust Control Systems for Smart Structures, 2001-2204, PI, \$149,177.
- Development of Optimization Technology for Building HVAC Systems, A\*STAR/Matrix Control Pte Ltd/NTU (Collaborator), Nov. 2000 – Oct. 2002, \$800,000.
- Development of Intelligent Monitoring and Control Systems for Hazardous Waste Chemical Treatment, NSTB/Purechem/NTU (Collaborator), 1999-2001, \$1.04m.
- A Robust and Adaptive Filtering Approach to Active Control of Noise in a Cleanroom, PI, 1998-2000, \$71,228.
- Advanced Digital Control Design for Industrial Processes, PI, 1993-1996, \$29,700.

### **Past and Current Postdoctoral Fellows:**

- Dr. Zhang Huanshui, Full Professor, Shandong University
- Dr. Sun Shuli, Full Professor, Heilongjiang University
- Dr. Hu Qinglei, Full Professor, Beihang University
- Dr. Li Tao, Full Professor, Outstanding Youth Award recipient, East China Normal University
- Dr. Li Zhongkui, Young Changjiang Talent Award recipient, Peking University
- Dr. Yu Mei, Associate Professor, North China Electric Power University
- Dr. Guo Yuqian, Full Professor, Central South University
- Dr. Jiang Hao, Associate Professor, Fuzhou University



- Dr. Li Huaqing, Full Professor, Southwest University
- Dr. Zhao Yanlong, Full Professor, Outstanding Youth Award recipient, Institute of System Sciences, Chinese Academy of Sciences
- Dr. Zhao Dongya, Full Professor, China Petroleum University
- Dr. Zhang Kuize, Associate Professor, Harbin Engineering University
- Dr. Khoo Suiyang, Senior Lecturer, Sweeburne University
- Dr. Li Wuquan, Associate Professor, Ludong University
- Dr. Li Haitao, Associate Professor, Jinan University
- Dr. Ma Cuiqin, Associate Professor, Qufu Normal University
- Dr. Zhu Bing, Associate Professor, Beihang University
- Dr. Lan Xiaoyu, Associate Professor
- Dr. Xu Juanjuan, Qiru Scholar, Full Professor, Shandong University
- Dr. Wan Liangtian, Associate Professor, Dalian University of Technology
- Dr. Meng Xiangyu, Assistant Professor, Louisiana State University
- Dr. Li Xianwei, Young Thousand Talent, Assistant Professor, Shanghai Jiaotong University
- Dr. Zhu Shanying, Assistant Professor, Shanghai Jiaotong University
- Dr. Weng Yang, Associate Professor, Sichuan University
- Dr. Qu Xiaomei, Associate Professor, Southwestern Minority University
- Dr. Huang Baoqi, Full Professor, Inter-Mongolian University
- Dr. Ding Baocang, Full Professor, Xi'an Jiaotong University
- Dr. Li Fangfei, Associate Professor, East China University of Science and Technology
- Dr. Zheng Jianying, Associate Professor, Beihang University
- Dr. Han Zhimin, Associate Professor, Hangzhou Dianzhi University
- Dr. Li Xian, Associate Professor, Qingdao University
- Dr. Chen Zhenghua, Institute of Info-Comm Research, Singapore
- Dr. Qi Qingyuan, Associate Professor, Qingdao University
- Dr. Chen Chun-Lin, Senior Research Fellow, NTU
- Dr. Li Maoxun, Research Fellow, NTU
- Dr. Li Xiuxian, Associate Professor, Tongji University
- Dr. Ran Maopeng, Research Fellow, NTU
- Dr. Ding Kemi, Research Fellow, NTU
- Dr. Yuan Shenghai, Research Fellow, NTU
- Dr. Xu Qianwen, Assistant Professor, Royal Institute of Technology (KTH), Sweden
- Dr. Chen Ci, NTU Presidential Postdoctoral Fellow
- Dr. Qiu Zhirong, Research Fellow, NTU
- Dr. Lyu Yang, Research Fellow, NTU
- Dr. Nguyen Pham Nhat Thien Minh, NTU Presidential Postdoctoral Fellowship, NTU
- Dr. Abdul Hanif Bin Zaini, Research Fellow, NTU

- Dr. Yang Jianfei, NTU Presidential Postdoctoral Fellowship, NTU

### **Graduated PhD students (36):**

- Xie Shoulie, 1997-1999, Ph.D. (I2R, A\*Star, Singapore)  
Thesis title: Robust and nonlinear control of interconnected systems.
- Du Chunling, 1997-1999, Ph.D. (Advanced Remanufacturing Center, A\*Star, Singapore)  
Thesis title: H-infinity filtering and control of two-dimensional systems.
- Li Luowen, 1997-1999, Ph.D. (Manager, ST Engineering)  
Thesis title: Optimal model reduction and reduced order filtering.
- Zhou Huan, 2000 - 2003, Ph.D. (I2R, A\*Star, Singapore)  
Thesis title: H2 and H-infinity optimal design of multirate filter bank systems.
- Lu Lilei, 2000- 2004, Ph.D.  
Thesis title: Issues in Robust and Networked Control Systems.
- Zhang Sen, 2002-2005, Ph.D. (Professor, Beijing University of Science and Technology)  
Thesis title: Simultaneous Localization and Map Building for Outdoor Mobile Robot Navigation.
- Xu Jun, 2003- 2006, Ph.D. (Senior Vice-President, Applied Innovation, HSBC)  
Thesis title: Control and Estimation of Piecewise Affine Systems.
- Cao Chengtao, 2003- 2007, PhD (ST Electronics)  
Thesis title: A Polynomial Approach to Robust Estimation with Applications in DS-CDMA Systems.
- Lin Jun, 2002- 2007, Ph.D.  
Thesis title: Robust Deconvolution and Control of Uncertain and Time Delay Systems with Applications.
- Teoh Jul Nee, 2003-2007, Ph.D.  
Thesis title: High precision servo control in disk drives.
- Lin Jianyong, 2005-2010, Ph.D.  
Thesis title: Energy Efficient Sensor Scheduling and Filtering Algorithms for Target Tracking in Wireless Sensor Networks
- You Keyou., 2007-2011, Ph.D. (Associate Professor, Young Thousand Talent, Outstanding Youth, Tsinghua University)  
Thesis title: Control and Estimation with Limited Data Rate and Packet Loss
- Xiao Nan, 2007-2011, Ph.D. (Research Scientist, Alibaba)  
Thesis title: Filtering and Control of Networked Systems over Unreliable Channels
- Liu Shuai, 2007-2011, Ph.D. (Professor, Young Thousand Talent, Shandong University)  
Thesis title: Control of Single and Multiple Agent Systems with Input and Communication Delays

- Hu Jinwei, 2008-2012, Ph.D. (Associate Professor, Northwestern Polytechnic University)  
Thesis Title: Information Fusion and Cooperative Control for Target Search and Localization in Multi-Agent Sensor Networks
- Gao Tingting, 2008-2012, Ph.D. (Associate Professor, Ningbo University)  
Thesis Title: Integrated Plant/Controller Design and Implementation for High Track Density HDD Servo Systems
- Meng Wei, 2009-2013, Ph.D. (Professor, Young Thousand Talent, Guangdong University of Technology)  
Thesis Title: Distributed Source Localization in Wireless Sensor Networks
- Yang Zai, 2009-2013, Ph.D. (Professor, Outstanding Youth, Xian Jiaotong University)  
Thesis Title: Analysis, Algorithms and Applications of Compressed Sensing
- Yu Chengpu, 2009-2013, Ph.D. (Professor, Young Thousand Talent, Beijing Institute of Technology)  
Thesis Title: Blind System Identification with Application to Medical Imaging
- Wang Xuehe, Aug. 2011-2015, Ph.D. (Assistant Professor, Singapore Institute of Technology)  
Thesis Title: Existence, Convergence and Efficiency Analysis of Nash Equilibrium and Its Applications
- Zou Han, 2012 – 2016, Ph.D. (Scientist, IBM)  
Thesis Title: Robust and Accurate Localization Algorithms for Indoor Positioning and Navigation
- Long Yushen, 2012- 2016, Ph.D. (Research Scientist, I2R)  
Thesis Title: Distributed and Cooperative Control with Applications to Building HVAC Systems
- Qiu Zhirong, 2013-2017, Ph.D. (Research Fellow, NTU)  
Thesis Title: Distributed Multi-agent Consensus under Constraints
- Xu Liang, 2013-2017, Ph.D. (Postdoctoral Fellow, EPFL)  
Thesis Title: Control over Networks with Fading Communication Channels
- Niu Junpeng, Jan 2014 –Jan. 2018, Ph.D. (Grab)  
Thesis Title: Hybrid System Analysis and Design for Scale-out Storage Environments
- Sampath Kumar Padmanabhan, 2014-2018, Ph.D. (Research Engineer, Delta Electronics)  
Thesis Title: Condition Monitoring of Brushless Synchronous Generators Using Wireless Sensor Networks
- Guo Kexin, 2014-2018, Ph.D. (Beihang University)  
Thesis Title: Ultra-Wideband-Based Navigation for Unmanned Aerial Vehicles
- Wang Chen, 2014-2018, Ph.D. (Postdoctoral Fellow, CMU)  
Thesis Title: Kernel Learning for Visual Perception
- Wu Xuepei, 2012-2018, Ph.D. (Continental)  
Thesis Title: Study on Real-time Industrial Control Networks

- Nguyen Pham Nhat Thien Minh, 2015-2019, Ph.D. (Wallenberg-NTU Presidential Postdoctoral Fellow)  
Thesis Title: Ranging-Based Adaptive Navigation for Autonomous Micro Aerial Vehicles
- Abdul Hanif Bin Zaini, 2015-2019, Ph.D. (Research Fellow, NTU)  
Thesis Title: UAV Swarming with Collision Avoidance and Communication Constraints
- Cao Kun, 2016 – 2020, PhD  
Thesis Title: Distributed Formation Shape Control of Multi-Robot Systems
- Yang Jianfei, Aug. 2016 – 2020, PhD (NTU Presidential Postdoctoral Fellow)  
Thesis Title: Towards Robust Sensing and Recognition: From Statistical Learning to Transfer Learning
- Gao Yulong, Aug. 2016 – Dec. 2020, PhD (Joint KTH-NTU PhD Programme)  
Safe Autonomy under Uncertainty: Computation, Control, and Application
- Wang Han, Jan. 2017- 2021, PhD  
Thesis Title: Robust and Light-weight Simultaneous Localization and Mapping for Autonomous Vehicles
- Fang Xu, Jan. 2017- 2021, PhD (Wallenberg-NTU Presidential Postdoctoral Fellow)  
Thesis Title: Cooperative Localization and Control of Networked Systems

**Co-supervised/helped supervise graduated Ph.D. students:**

- Wang Song, 1996 - 2000, PhD, University of Melbourne, Australia.
- Tan Zhiqiang, 1996-1999, PhD, Nanyang Technological University.
- Zhu Xing, 1999-2002, PhD, Nanyang Technological University.

**On-going Ph.D. students:**

- Huang He, Aug. 2020 -  
Precision Docking of Robots
- Qian Hanjie, Aug. 2019 –  
Machine Learning for Defect Detection
- Cao Muqing, August 2018 –  
Task allocation and tracking control in façade inspection
- Nguyen Hoang Thien, Aug. 2018 –  
Range-assisted Visual-Inertia Odometry
- Wang Dazhuo, Aug. 2018 –  
Machine learning for activity recognition
- Li Juncheng, August 2017 – July 2021, PhD  
Thesis Title: Motion Planning for Non-Holonomic Mobile Robots in Obstacle-Rich Environments
- Liu Hanxiao, August 2017 – Jan 2021, PhD (thesis submitted)

Thesis Title: Analysis, Detection, and Mitigation of Attacks in Cyber-physical Systems

- Ji Tete, Jan. 2017- (Part-Time)

Visual-Inertial Navigation for MAV

### **Graduated MEng Students:**

- Chen Chang, 1995 - 1996, MEng (DSO)

Thesis title: Robust and optimal control of helicopter systems.

- Xie Shoulie, 1995 - 1996, MEng (I2R)

Thesis title: Dissipative control of uncertain dynamical systems.

- Su Weizhou, 1995 - 1996, MEng (Professor, South China University of Technology)

Thesis title: Robust control of cascaded uncertain nonlinear systems.

- Tian Hui, 1997 - 1999, MEng

Thesis title: Nonlinear composite control of hard disk drives.

- Yang Xiao Hua, 1997 - 1999, MEng

Thesis title: Adaptive active noise control.

- Bayu Jayawardhana, 2001-2003, MEng (Professor, Groningen University, Netherland)

Thesis title: Active Noise Control for Air Handling Duct.

- Toh Yue Khing, M.Eng, 2008-2010 (CEO)

Thesis title: Development of a wireless sensor network for target tracking and surveillance

- Yu Zhong, Aug. 2007- Aug. 2010, MEng.

Thesis title: Distributed consensus of second –order multi-agent systems

- Fei Du, Master of Philosophy, 2000-2001

Thesis title: Channel equalization for wireless communications

- Saba Salehi, M.Eng, 2008-2010

Thesis title: Analysis and design of networked control systems

- Ni Wei, 2008-2010, MEng

Thesis title: Decentralized control of multi-input multi-output integrating processes

- Toh Teow Ghee, 2009-2012, MEng, on-going

Thesis title: Development of Advanced Virtual Collaborative Multi-Vehicle Simulation Platform

- Lu Xiaoxuan, Aug. 2013-July 2015, MEng, Postdoctoral Fellow, Oxford University

Thesis Title: Development of Localization Algorithms for a WiFi Based Indoor Positioning System with Machine Learning Techniques

- Wei Dong, 2014-2016, MEng (COO)

Thesis Title: Distributed Unmanned Aerial Vehicles Formation with Built-in Safety Systems

- Zhang Songyuan, Aug. 2014-2016, MEng (CEO)

Thesis Title: Vision based Navigation and Control of Unmanned Aerial Vehicles

- Huang He, 2019-2020, MSc

Dissertation Title: A Navigation Method for Autonomous Guided Vehicles in Industrial Environment

- Zhu Zheyu, 2019-2020, MSc

Dissertation Title: WiFi Based Device-Free Human Activity Recognition

- Gnanaprakasam Naveen, 2019-2020, MSc

Dissertation Title: Development of an Autonomous Camera-Gimbal System for Target Following or Artifact Detection Applications

## **Awards received by my students:**

- You Keyou, Young Thousand Talent (青年千人), 2014.
- Liu Shuai, Young Thousand Talent (青年千人), 2017.
- Meng Wei, Young Thousand Talent (青年千人), 2018.
- Yu Chengpu, Young Thousand Talent (青年千人), 2018.
- You Keyou, Outstanding Youth (优青), 2014.
- Yang Zai, Outstanding Youth (优青), 2019.
- PhD student Yang Jianfei won the award "PEER Hub ImageNet Challenge by Pacific Earthquake Engineering Research Center," Los Angeles, USA, 2018.
- PhD student Nguyen Pham Nhat Thien Minh received won the 2020 Best EEE Thesis Award in the Doctorate Innovation Award Category.
- PhD student Nguyen Pham Nhat Thien Minh won the Graduate College Innovation & Entrepreneurship Award in the academic year 2019-2020.
- PhD student Nguyen Pham Nhat Thien Minh won Wallenberg-NTU Presidential Postdoctoral Fellowship Award in 2020.
- PhD Student Yang Jinafei won NTU Presidential Postdoctoral Fellowship Award.
- PhD Student Yang Jianfei received EEE Commendation for Doctorate Innovation Award 2021.
- PhD Student Yang Jianfei received Graduate College Innovation & Entrepreneurship Award 2020-2021 (runner-up).
- PhD Student Fang Xu won Wallenberg-NTU Presidential Postdoctoral Fellowship Award in 2021.
- PhD Student Wang Han received Huawei Gifted Youth Award (华为少年天才) in 2021.

## **Other Professional Services:**

- Member of Advisory Board, Department of Automation, Tsinghua University, 2020.
- Member of Long Range Planning Committee, IEEE Control System Society, 2020.
- Member of Fellow Evaluation Committee, IEEE System, Man, and Cybernetics Society, 2019.

- Elected Member of Board of Governors, IEEE Control System Society, Jan 2016 – Dec. 2018.
- Member of IFAC Manfred Thoma Medal Selection Committee, 2015.
- Member of Advisory Committee on Mechanical and Automation Engineering, Department of Mechanical and Automation Engineering, The Chinese University of Hong Kong, 1 August 2014 to 31 July 2017.
- Member of Hanfu Chen Award Committee, Chinese Automation Association, January 2014 to December 2017.
- Vide-President, Technical Committee of Control Theory and Applications, Chinese Academy of Sciences since 2012.
- Vice Program Chair, the 54<sup>th</sup> IEEE Conference on Decision and Control, Japan, 2015.
- Appointed Member, Board of Governors, IEEE Control Systems Society, 2011.
- IEEE Singapore Control Systems Society Chapter
  - Chapter Committee Member, 1993-1999
  - Honorary Secretary, 2000 - 2001;
  - Chapter Committee Member, 2002 – 2003;
  - Treasurer, 2004-2005;
  - Chairman, 2006-2007;
  - Treasurer, 2008-2009;
  - Chapter Committee Member, 2010-2015.
  - Treasurer, 2016-2017
- Associate member, Centre for Integrated Dynamics and Control (funded by the Australian Government), the University of Newcastle, Australia since June 1997.
- Member of Technical Committee on Linear Systems Theory, International Federation of Automatic Control, 2003-.
- Member of Technical Committee on Control Theory, Chinese Association of Automation since Jan. 2008.

## **Public Services:**

- Mentor for A\*STAR AGS scholars since July 2002.
- Interview Panel Member, A\*STAR Scholarship Awards, 2003.
- Assessor, A\*STAR Scholarship Awards, 2005.
- Member, The National Science Challenge 2007.
- Member, The National Science Challenge 2008.

## **Major Services to the University:**

- Director, Centre for Advanced Robotics Technology Innovation, April 2021 – Present.

- Co-Director, Delta-NTU Corporate Lab for Cyber-Physical Systems, June 2016 – Present.
- Chair, School Review Committee for Promotion and Tenure, PT2-PT9 (2008-2011), PT14-PT24 (2014 –2020).
- Director, EEE-Delta Joint Lab on Internet of Things, Nov. 2014 – Present.
- Wallenberg-NTU Presidential Postdoctoral Fellowship Review Committee, 2019 – 2020.
- NTU Presidential Postdoctoral Fellowship Review Committee, 2020.
- Member of School Appraisal Committee, 2015, 2016, 2017, 2018, 2019.
- Head, Division of Control and Instrumentation, July 2011 –June 2014.
- Director, Centre for E-City, July 2011 – June 2013.
- Member, School Review Committee for Promotion and Tenure, PT1, 2007.
- Member of University Committee on Research Drivers, 2008-2011.
- Member of University Senate, 2008-2010.
- Member of University Senate, 2010-2012.
- Chair, School Reappointment Committee, 2009/10.
- Deputy Head, Division of Control and Instrumentation, School of EEE, 2008-2011.
- Director, Centre for Intelligent Machines, 2007-2011.
- Member of School Research Working Committee, 2007-2011.
- Member of School Resources Committee, 2008-2011.
- Member, School Publicity Committee, 2009-2012.



## LIST OF PUBLICATIONS (L. Xie)

- **Publications:** 9 books, 480 journal papers, 383 conference papers
- **SCI:** 25631; H-index of 77.
- **Google Scholar:** 41549, H-index of 99.
- Highly Cited Researcher by Clarivate Analytics (<https://clarivate.com/hcr/researchers-list>) in 2019.
- Highly Cited Researcher by Clarivate Analytics (<https://clarivate.com/hcr/researchers-list>) in 2018.
- Highly Cited Researcher by Clarivate Analytics (<https://clarivate.com/hcr/researchers-list>) in 2017.
- Highly Cited Researcher by Academic Ranking of World Universities (<http://www.shanghairanking.com/>) and Thomson Reuters in 2016.
- Highly Cited Researcher by Academic Ranking of World Universities (<http://www.shanghairanking.com/>) and Thomson Reuters in 2015.
- Highly Cited Researcher by Academic Ranking of World Universities (<http://www.shanghairanking.com/>) and Thomson Reuters, 2014.

## BOOKS

1. C. Du and L. Xie, H-infinity Control and Filtering of Two-dimensional Systems, Springer, 2002.
2. F. Lewis, L. Xie, and D. Popa, Optimal and Robust Estimation, CRC Press, 2007.
3. H. Zhang and L. Xie, Control and Estimation of Systems with Input/Output Delays, Springer, 2007.
4. C. Du and L. Xie, Modeling and Control of Vibration in Mechanical Systems, CRC Press, 2010.
5. J. Xu and L. Xie, Control and Estimation of Piecewise Affine Systems, Woodhead Publishing, 2013.
6. K. You, N. Xiao and L. Xie, Analysis and Design of Networked Control Systems, Springer, 2015.
7. Y. Guo, L. Xie and Y. Wang, Analysis and Design of Reset Control Systems, IET Control Engineering Series, 2015.
8. W. Zhang, L. Xie and B. Chen, Stochastic H<sub>2</sub>/H-infinity Control: A Nash Game Approach, CRC Press, 2017.
9. K. Zhang, L. Zhang and L. Xie, Discrete-Time and Discrete-Space Dynamical Systems —

## BOOK CHAPTERS

1. M. Fu, L. Xie and C.E de Souza, H-infinity Control for Linear Systems with Time-Varying Parameter Uncertainty, *Control of Uncertain Systems*, Ed., S.P. Bhattacharyya and L.H. Keel, USA, pp. 63-75, CRC-Press, 1991.
2. C.E. de Souza and L. Xie, Robust H-infinity Filtering, *Advances in Control and Dynamic Systems: Digital Signal Processing Techniques and Applications*, (Ed.), C.T. Leondes, pp. 323-377, Academic Press, New York, 1994.
3. S. Zhang, L. Xie and M. Adams, Efficient Data Association Approach to Simultaneous Localization and Map Building, in *Mobile Robots, Perception & Navigation*, (Ed.) S. Kolski, pp. 413-432, 2007.
4. S. Zhang, W. Xiao and L. Xie, "A Novel Feature Extraction for Outdoor Mobile Robot Localization", Book Chapter in *Mobile Robots Motion Planning*, New Challenges. Publisher: Pro Literatur Verlag, Germany, ISBN 978-3-902613-35-6, Chapter 30, pp. 583-598, June, 2008. <http://www.i-techononline.com/>
5. Ling Shi, Lihua Xie and Richard M. Murray, "State Estimation over an Unreliable Network," Book Chapter in *Wireless Networking Based Control* (Sudip K. Mazumder (Ed.)), Pages 29-55, Springer, 2011.
6. K. You and L. Xie, "Quantized Kalman Filtering of Linear Stochastic Systems," Book Chapter in *Kalman Filtering*, (Joaquín M. Gomez (Ed.)), Chapter 7, pp. 269-288, Nova Publisher, 2011.
7. Z. Yang, J. Li, P. Stoica, and L. Xie, "Sparse Methods for Direction-of-Arrival Estimation," in *Academic Press Library In Signal Processing Volume 7: Array, Radar And Communications Engineering* (M. Viberg, M. Pesavento, R. Chellappa and S. Theodoridis, eds.), in press.

## INVITED BOOK REVIEWS

1. L. Xie, "Uncertainty and Feedback – H-infinity Loop-Shaping and the v-Gap Metric," *Automatica*, vol. 41, pp. 1105-1106, 2005.
2. L. Xie, "Robust Control of Time-delay Systems," *Int. J. Robust and Nonlinear Control*, Vol. 19, pp. 611-612, 2009.
3. L. Xie, "Linear Systems Primer," *IEEE Control Systems Magazine*, accepted for publication.

## JOURNAL PAPERS

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