Sudchai Boonto

CONTACT INFORMATION

Department of Control System and Instrumentation Engineering
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RESEARCH INTERESTS

Robust Control, Linear Parameter-Varying Control, Mechatronic Systems, Feedforward Robust Control, Robust Repetitive Control, System Identification, Convex Optimization Applications

EDUCATION

Hamburg University of Technology (TUHH)

Dr.-Ing. in Automatic Control Engineering 2011

The University of Manchester Institute of Science and Technology (UMIST) , Now is The University of Manchester, UK

M.Sc., Advanced Control, March 2000

King Mongkut's University of Technology Thonburi, Bangkok, Thailand

B.Eng., Electrical Engineering, May 1995

ACADEMIC EXPERIENCE

King Mongkut's University of Technology Thonburi (KMUTT), Bangkok Thailand

Head of the department **Nov 2015-present**

Assistant Professor **2013–present**

Lecturer **1995–2013**

Undergraduate
- INC 102 Instrumentation and Process Control
- INC 111 Basic Engineering Circuit Analysis
- INC 151 Circuit Analysis by Engineering's Software Practice
- INC 211 Mathematics for Signals and Systems
- INC 221 Electronics Devices and Circuit Design
- INC 231 Electrical Measurement
- INC 251 Digital and Electronics Laboratory I
- INC 341 Feedback Control System
- INC 354 Process Instrumentation Laboratory
- INC 481 System Dynamics and Modelling

Graduate
- INC 521 System Identification
- INC 691 Linear and Nonlinear System Identification
- INC 692 Robust Control
- INC 693 System Dynamics and Modelling
- INC 694 Neural Network and Its Applications
- EEE 600 System Analysis Techniques

Hamburg University of Technology (TUHH), Hamburg Germany
Teaching Assistant **2003–2009**
- Neural and Genetic Computing for Control of Dynamic Systems

RESEARCH ACTIVITIES	**Since 2011**

RESEARCH ACTIVITIES

Since 2011

- "Robust PID Control for Grid-Control Three Phase Inverter using Convex-Concave Optimization", Government Budget Grant 2017-2018 [Principal Investigator]

- "Transient response improvement of PVC process with disturbance from reflux condenser", SCG Chemical 2016-2017 [Principal Investigator]

- "Two-Degree-of-Freedom $\mathcal{H}_\infty$ Repetitive Control for Grid-Connected Inverter", Research Strengthening Project of the Faculty of Engineering KMUTT 2014-2016 [Principal Investigator]

- "Advanced Control System Design for Power Electronics and Motor Drives using a New Heuristic Optimization Algorithm," Research Strengthening Project of the Faculty of Engineering, King Mongkut's University of Technology Thonburi, 2014-2017 [Team Member]

Before 2011

- "Prototype development of the noise and vibration spectrum analyzer for industrial process", KMUTT, 2002, [Team Member]

- "Development of the seed moisture meter prototype using a microwave frequency range non-destructive method", KMUTT, 2003, [Team Member]

SCHOLARSHIPS FOR STUDENTS

Since 2011

- *M.Eng. Scholarship* "$\mathcal{H}_\infty$ Power Control for Grid–Connected Inverter" Energy Policy and Planning Office (EPPO) years 2012-2014

- *M.Eng. Scholarship* "2DoF Robust Repetitive Control for Grid–Connected Inverter" Energy Policy and Planning Office (EPPO) years 2015-2017

PROFESSIONAL SERVICE

IEEE Control System Chapter Thailand

- Secretary 2016-present

Conference Organizing Committee

- EECON-25

Technical Program Chair

- ICITEE 2017

Reviewer of

- IEEE 2007 Conference on Automation Science and Engineering, TENCON 2014, iEECON 2014

- MCS 2009, CDC 2009-2013,2015-2016, IFAC world congress 2011, ECTI-CON 2011,2013-2014,2016, EECON 29, 35-36, ACC 2010-2013,2015, ECC 2015, ICIEA 2017, ASCC 2017, ICITEE 2017

- IFAC 8th Safeprocess 2012, SEATUC 2012, TSME-ICoME 2013

- KMUTT R&D Journal, Engineering Journal (EJ), Thammasat International Journal of Science and Technology (TIJSAT)

- International Journal of Robust and Nonlinear Control, International Journal of Adaptive Control and Signal Processing

JOURNAL PUBLICATION

International Journal

1. R. Körlin, **S. Boonto**, H. Werner, U. Starossek, " LMI-based Gain Scheduling for Bridge Flutter Control using Eccentric Rotational Actuators," *Optimal Control, Applications and Methods*, Vol. 33, No. 4, 2012, pp. 488–500. (**Impact Factor = 1.06 in 2012**)

2. T. Nuchkrua, W. Kornmaneesang, S.-L. Chen, and **S. Boonto**,"Precision Contouring Control of 5 DOF Dual-arm Robot Manipulators with Holonomic Constraints", *IEEE transaction on control system technology* (submitted)

3. T. Nuchkrua, S.-L. Chen, **S. Boonto**, "Adaptive Contouring Control for High-precision 5 DoF Robot Manipulators under Various Environments," *Asian Journal of Control* (submitted)

4. T. Nuchkrau, W. Kornmaneesang, S.-L. Chen, and **S. Boonto**, "High-precision Control of Dual-arm Robot Manipulators with Holonomic Constraints," *IEEE Robotics and Automation Letters* (submitted)

5. **S. Boonto**, and T. Nuchkrua, "Non-linear Control for Thermal System of Metal Hydride," *International Journal of Hydrogen Energy* (accepted)

National Journal

1. V. Sittiarttakorn and **S. Boonto**, "Hybrid Engine Model Using a Stirling Engine and a DC Motor,"*Journal of the Japan Society of Applied Electromagnetic and Mechanics*, Vol. 23, No. 3, 2015, pp. 563–566.

CONFERENCE
PRESENTATIONS

International Conference

1. T. Nuchkrau, W. Kornmaneesang, S.-L. Chen, and **S. Boonto**, "Precision Contouring Control of 5 DOF Dual-arm Robot Manipulators with Holonomic Constraints," In Proceedings of 2017 Asian Control Conference (ASCC 2017), Gold Coast Convention Centre, Australia, December 17–20, 2017 (to appear)

2. V. Sittiarttakorn, and **S. Boonto**, "Mobile Robot Multi-Paths Tracking Control Using Optical Coding", In Proceedings of the 4th International Conference on Applied Electrical and Mechanical Engineering 2017 (ICAEME 2017), Nongkhai Thailand, August 31–September 2, 2017 (Best paper award)

3. T. Nuchkrua, S.-L. Chen, **S. Boonto**,"A Novel Technique of Dual-arm Robot Manipulators: Path-contouring Control Problem," In *Proceeding of the 13thIEEE International Conference on Control & Automation (ICCA 2017)*, Ohrid, Macedonia, July 3–6, 2017, pp. 867–871

4. P. Phowanna, **S. Boonto**, E. Mujjalinvimut, M. Konghirun, W. Lenwari, "Improved Performance of Sliding Mode Observer Using Parameter Adaptation in Sensorless IPMSM Drive," In *Proceedings of The 12th IEEE Conference on Industrial Electronics and Applications (ICIEA 2017)*, Siem Reap, Cambodia, June 18-20, 2017

5. T. Nuchkrua, S.-L. Chen, **S. Boonto**, "Adaptive Contouring Control for High-precision 5 DoF Robot Manipulators under Various Environments," In *Proceedings of the 2016 International Automatic Control Conference (CACS 2016)*, Evergreen Laurel Hotel,Taichung, Taiwan, Novemver 9-11, 2016

6. W. Sintanavevong, **S. Boonto**, S. Naetiladdanon, "Robust Repetitive Control with Feedforward Scheme for Stand-Alone Inverter," In *Proceedings of the 16th International Conference on Control, Automation and Systems*, HICO, Gyeongju, Korea, October 16-19, 2016, pp. 359–364

7. C. Thabthimratthana, S. Saelim, S. Tiewcharoen, **S. Boonto**, "Robust PID Controller Design Using Convex-Concave Optimization: Application to an Unstable System," To appear in *Proceedings of the 16th International Conference on Control, Automation and Systems*, HICO, Gyeongju, Korea, October 16-19, 2016, pp. 638–643

8. P. Phowanna, **S. Boonto**, M. Konghirun, "Online Parameter Identification Method for IPMSM Drive with MTPA," In *Proceedings of the 18th International Conference on Electrical Machines and Systems*, Pattaya City, Thailand, October 25-28, 2015

9. V. Sittiarttakorn, **S. Boonto**, "Hybrid Modeling Using a Stirling Engine and a DC Motor," In *Proceedings of the Asia-Pacific Symposium on Applied Electromagnetic and Mechanics*, National Chung Hsing University, Taichung, Taiwan, July 23-25, 2014

10. W. Sriart, **S. Boonto**, S. Naetiladdanon, W. Lenwari, "Grid Connected Inverter Control by Two-Degree-of-Freedom Robust H_∞ Repetitive," In *Proceedings of The 2014 International Conference on Electrical Engineering/Electronics,Computer, Telecommunications and Information Technology (ECIT-CON 2014)*, Nakhon Ratchasima, Thailand, May 14–17, 2014,

11. W. Sriart, **S. Boonto**, S. Naetiladdanon, W. Lenwari, "Two-Degree-of-Freedom Robust $\mathcal{H}_\infty$ Repetitive Control for Grid-Connected Inverter," In *Proceedings of the 11th IEEE International Conference on Control and Automation (ICCA 2014)*, Taichung, Taiwan, June 18-20, 2014, pp. 791–796

12. N. Patcharaprakiti, K. Kirtikara, A. Sanswang, **S. Boonto**, "Stability Analysis of a Photovoltaic Grid Connected Inverter Model Based on System Identification," In *Proceedings of the 2012 IEEE Region 10 Conference*, Cebu, Philippines, November 19–22, 2012, pp. 1–4.

13. A. Kominek, S. Remolina, **S. Boonto**, H. Werner, M. Garwon, and M. Schultalbers, "Low-Complexity LPV Input-Output Identification and Control of a Turbocharged Combustion Engine," In *Proceedings of the 51th IEEE Conference on Decision and Control*, Maui, HI., USA, December 10–13, 2012, pp. 4492–4497.

14. **S. Boonto** and W. Lenwari, "Two-Degree-of-Freedom $\mathcal{H}_\infty$ Control Design for Harmonic Current Control of Shunt Active Filters," In *Proceedings of the 15th IEEE International Conference on Harmonics and Quality of Power (ICHQP 2012)*, Hong Kong, June 2012, pp. 887–891

15. Q. Liu, G. Kaiser, **S. Boonto**, H. Werner, F. Holzmann, B. Chertien, M. Korte, "Two-Degree-of-Freedom LPV Control for a through-the-Road Hybrid Electric Vehicle via Torque Vectoring," In *Proceedings of the 50th IEEE Conference on Decision and Control and European Control Conference – CDC–ECC 2011*, Orlando, FL, USA, December 12–15, 2011, pp. 1274–1279.

16. I. Wior, **S. Boonto**, H. Abbas, H. Werner, "Modeling and Control of an Experimental pH Neutralization Plant using Neural Networks based Approximate Predictive Control," In *Proceedings of the 1st Virtual Control Conference*, Denmark, 22 Sep, 2010, (online).

17. **S. Boonto**, H. Werner, "Closed-Loop Identification of LPV Models Using Cubic Splines with Application to an Arm-Driven Inverted Pendulum," In *Proceedings of the 2010 American Control Conference – ACC2010*, Baltimore, Maryland, USA, June 30 - July 2, 2010, pp. 3100–3105

18. **S. Boonto**, H. Werner, "Closed-Loop System Identification of LPV Input-Output Models – Application to an Arm-Driven Inverted Pendulum," In *Proceedings of the 47th IEEE Conference on Decision and Control*, Cancun, Mexico , December 9–11, 2008, pp. 2606–2611

19. J. Witt, **S. Boonto**, H. Werner, "Approximate Model Predictive Control of a 3-DOF Helicopter," In *Proceedings of the 46th IEEE Conference on Decision and Control*, New Orleans, Louisiana USA, December 12–14, 2007, pp. 4501–4506

20. O. Supatti, **S. Boonto**, C. Prapanavarat, V. Moneyagul, "Design of an $\mathcal{H}_\infty$ Robust Controlled for Multimodule Parallel DC-DC Buck Converters with Average Current Mode Control," In *Proceedings of IEEE International Conference on Industrial Technology* , Bangkok, Thailand, December 11–14, 2002, pp. 992-997.

21. O. Supatti, **S. Boonto**, C. Prapanavarat, V. Moneyagul, "$\mathcal{H}_\infty$ Controller Design for Parallel DC-DC Buck Converters," In *Proceedings of 17th Korea Automatic Control Conf.*, Jeonbuk, Korea, October 16–19, 2002, pp. 1159 -1163.

National Conference

1. N. Dernlugkam, **S. Boonto**, P. Siriprala, "Identification and Control of a Half-scale Platform of Multi-Launcher Rocket System," In *Proceedings of the 36th Electrical Engineering Conference (EECON36)*, Kanchanaburi, Thailand, December 11-13, 2013. (in Thai)

2. C. Techawatcharapaikul, **S. Boonto**, "PI/PID Design and Tuning via LMI with Time Domain Constraint," In *Proceedings of the 41st Kasetsart University Annual Conference*, Bangkok, Thailand, February 2003. (in Thai)

3. S. Teratanajaru, **S. Boonto**, A. Chaisawadi, "On-line area-based computation method for first-order plus dead-time model system identification from step response," In *Proceedings of the 17th Conference on Mechanical Engineering Network of Thailand*, Prajeanburi, Thailand, October 2003.

4. P. Sritanauthaikarn, **S. Boonto**, A. Chaisawadi,"Linear Matrix Inequalities Based Controller Design for Crane System," In *Proceedings of the 17th Conference on Mechanical Engineering Network of Thailand*, Prajeanburi, Thailand, October 2003. (in Thai)