

Education

- **Ph.D. in Engineering** (May 2013)
College of Engineering and Computer Science
Australian National University (ANU), ACT 2600, Australia
- **B.Sc. in Electrical and Electronic Engineering** (January 2009)
1st Class, Department of Electrical and Electronic Engineering (EEE)
Bangladesh University of Engineering and Technology, Dhaka 1000, Bangladesh

Employment History

- **Advance Queensland Research Fellow** (September 2017 to Present)
School of Information Technology and Electrical Engineering (ITEE)
The University of Queensland, St Lucia, Brisbane, QLD 4072, Australia.
- **Research Scientist** (March 2015 – July 2017)
SUTD-MIT International Design Centre (IDC), SUTD, 8 Somapah Road, Singapore 487372.
- **Postdoctoral Research Fellow** (Sept. 2013 – Feb. 2015)
Engineering Product Development, SUTD, 8 Somapah Road, Singapore 487372.
- **Visiting Researcher** (Jan. 2013 - June 2013)
Optimization Research Group, National ICT Australia (NICTA), 7 London Circuit, ACT 2601, Australia.
- **Ph.D. Student** (Apr. 2009 - Dec. 2012)
Research School of Engineering, ANU, ACT 0200, Australia.
- **Visiting Student Research Collaborator (VSRC)** (Summer 2011)
School of Engineering and Applied Science, Princeton University, Princeton, NJ, USA.
- **Lecturer** (June 2007 – Mar. 2009)
Department of Electrical and Computer Engineering, Presidency University, Dhaka 1212, Bangladesh.

Research Grant

- **Peer-to-peer energy trading scheme for sustainable cities - Ongoing**
Grantor: Queensland State Government under Advance QLD Research Fellowship.
Duration: 09/ 2017-09/ 2020.
Awarded amount: \$ 384,874.00.
Role: Chief Investigator (CI).
- **Green building management system – An open IoT platform approach - Ongoing**
Grantor: Building and Construction Authority (BCA), Singapore.
Duration: 10/2016-10/2018)
Awarded amount¹: \$1,018,820.00
Role: Co-CI. Currently involved as *a collaborator* after moving to Australia on 09/2017.
- **Consumer-centric energy management for buildings: Design innovation technique for sustainability - Ongoing**
Grantor: SUTD-MIT International Design Centre.
Duration: 07/2017 – 06/2019.
Awarded amount: \$93,156.50
Role: Co-CI. Currently involved as *a collaborator* after moving to Australia on 09/2017.
- **A pilot project for developing smart energy management system prototype - completed**
Grantor: SUTD-MIT International Design Centre.
Duration: 08/2015 – 07/2017.
Awarded amount: \$95,783.80
Role: CI.
- **Building a toolset for energy audit systems - Completed**
Grantor: SUTD-MIT International Design Centre.
Duration: 01/2016 – 08/2016.
Awarded amount: \$21,790.70
Role: CI.
- **A general grant for IDC leveraged pilot project - Completed**
Grantor: SUTD-MIT International Design Centre.
Duration: 04/2015 – 03/2016.
Awarded amount: \$3,433.62
Role: CI.

Other Project Management

- As Co-CI: Demand focused smart energy management in end-user environments for sustainable cities. Funded by Energy Market Authority (EMA), Singapore (March 2013 – March 2016).
Comment: Did not participate in grant writing.

¹ All SGD to AUD conversions are done by using OANDA currency converter (<https://www.oanda.com/currency/converter/>) based on the date the project was awarded.

- As Co-CI: On the sustainability of the MICE industry in Singapore. Funded by Singapore Tourism Board (STB), Singapore (January 2014 – December 2015).

Comment: Did not participate in grant writing.

Awards and Prizes

- Advance Queensland Research Fellowship (2017-2020).
- Best Paper Award in IEEE International Conference on Communications (ICC), 2013.
- Best Student Paper Award in Australian Communications Theory Works (AusCTW), 2012.
- NICTA Travel Grant, 2012.
- ANU Vice-Chancellor Higher Degree Travel Grant, 2012.
- ANU CECS Dean Travel Grant for pursuing excellence in research at Princeton University, USA 2011 (two CECS students were awarded each year)
- ANU-NICTA Ph.D. Scholarship (2009-2012)
- ANU-NICTA Tuition Fee Scholarship (2009-2012)
- ANU-NICTA Supplementary Scholarship (2009-2012)
- ANU-NICTA Assignment Scholarship (2009-2012)
- NICTA Travel Grant 2010.
- IEEE Bangladesh Section Best Undergraduate Student Paper Award, 2007.
- Bangladesh Government Scholarship for outstanding academic performance (1999-2007).

Membership of Professional Associations

- *Institute of Electrical and Electronic Engineers (IEEE)*
Student member (2006-2012); Member (2013-present)
- *IEEE Power and Energy Society*
Member (2017- present)

Book Chapter

1. N. Bashir, N. U. Hassan, C. Yuen and **W. Tushar**, "Smart grid communications and standards," in *Communication, Control and Security Challenges for the Smart Grid*, 1st Edition, IET Publisher, ch. 3, Apr. 2017 (doi: 10.1049/PBPO095E)

Patent

1. C. Yuen, **W. Tushar**, W.-T. Li, K. L. Wood, and S. G. Kerk, "Method for managing energy supply-demand in smart network," *Singapore Provisional Patent*, no 10201701008X, Filing date: February 08, 2017.

Journal Publication

1. **W. Tushar**, C. Yuen, D. B. Smith, and H. V. Poor, "Price discrimination for energy trading in smart grid: A game theoretic approach," *IEEE Transactions on Smart Grid*, vol. 8, no 4, pp. 1790-1801, July 2017.
2. **W. Tushar**, W. Tao, L. Lan, Y. Xu, C. Withanage, C. Yuen, and K. L. Wood, "Policy design for controlling set-point temperature of ACs in shared spaces of buildings," *Energy and Buildings*, vol. 134, pp. 105-114, Jan. 2017.
3. P. You, S. H. Low, **W. Tushar**, G. Geng, C. Yuen, Z. Yang, and Y. Sun, "Scheduling of EV battery swapping, I: Centralized solution," *IEEE Transactions on Control Network Systems*, 2017 (accepted on October 26, 2017)
4. L. Lan, **W. Tushar**, K. Otto, C. Yuen, and K. L. Wood, "Thermal comfort improvement of naturally ventilated patient wards in Singapore," *Elsevier Energy and Buildings*, vol. 154, pp. 499-512, Nov. 2017.
5. W.-T. Li, S. R. Gubba, **W. Tushar**, C. Yuen, N. U. Hassan, H. V. Poor, K. L. Wood, and C.-K. Wen, "Data-driven electricity management for residential air conditioning systems: An experimental approach," *IEEE Transactions on Emerging Topics in Computing*, 2017 (accepted on January 03, 2017; doi: 10.1109/TETC.2017.2655362).
6. N. U. Hassan, **W. Tushar**, C. Yuen, S. G. Kerk, and S. W. Oh, "Guaranteeing QoS using unlicensed TV white space for smart grid applications," *IEEE Wireless Communications Magazine*, vol. 24, no 2, pp. 18-25, Apr. 2017.
7. N. Reyhanian, B. Maham, V. Shah-Mansouri, **W. Tushar**, and C. Yuen, "Game-theoretic approaches for energy cooperation in energy harvesting small cell networks," *IEEE Transactions on Vehicular Technology*, vol. 66, no 8, pp. 7178-7194, Aug. 2017.
8. **W. Tushar**, B. Chai, C. Yuen, S. Huang, D. Smith, H. V. Poor, and Z. Yang, "Energy storage sharing in smart grid: A modified auction-based approach," in *IEEE Transactions on Smart Grid*, vol. 7, no 3, pp. 1462-1475, May 2016.
9. **W. Tushar**, C. Yuen, S. Huang, D. B. Smith, and H. Vincent Poor, "Cost minimization of charging stations with photovoltaic: An Approach with EV Classification," in *IEEE Transactions on Intelligent Transportation Systems*, vol. 17, no. 1, pp. 156-169, Jan. 2016.
10. **W. Tushar**, C. Yuen, B. Chai, S. Huang, K. L. Wood, S. G. Kerk, and Z. Yang, "Smart grid testbed for demand focused energy management in end-user environment," in *IEEE Wireless Communication Magazine*, vol. 23, no 6, pp. 70-80, Dec. 2016.
11. **W. Tushar**, J. A. Zhang, C. Yuen, D. Smith, and N. U. Hassan, "Management of renewable energy for a shared facility controller in smart grid," in *IEEE Access*, vol. 4, pp., 4269-4281, Aug. 2016.
12. **W. Tushar**, C. Yuen, L. Kai, K. L. Wood, Z. Wei, and L. Xiang, "Design of cloud-connected IoT system for smart building on energy management," in *EAI Endorsed Transactions on Industrial Networks and Intelligent Systems*, vol. 16, no. 6, pp. 1-9, Jan. 2016 - *invited paper*
13. L. Ma, N. Liu, J. Zhang, **W. Tushar**, and C. Yuen, "Energy management for joint operation of CHP and PV prosumers inside a grid-connected microgrid: A game theoretic approach," in *IEEE Transactions on Industrial Informatics*, vol. 12, no 5, pp. 1930-1942, Oct. 2016.
14. S. K. Viswanath, C. Yuen, **W. Tushar**, W.-T. Li, C.-K. Wen, C. Chen, and X. Liu, "System design of internet-of-things for residential smart grid," in *IEEE Wireless Communication Magazine*, vol. 23, no 5, pp. 90-98, Oct. 2016.

15. **W. Tushar**, B. Chai, C. Yuen, D. Smith, K. L. Wood, Z. Yang, and H. V. Poor, "Three-party energy management with distributed energy resources in smart grid" in *IEEE Transactions on Industrial Electronics*, vol. 62, no. 4, pp. 2487-2498, Apr. 2015.
16. W-T. Li, C. Yuen, N. Hassan, **W. Tushar**, and C.-K. Wen, "Demand response management for residential smart grid: From theory to practice," in *IEEE Access*, vol. 3, pp. 2431-2440, Nov. 2015.
17. A. Naeem, A. Shabbir, N. U. Hassan, C. Yuen, A. Ahmed, and **W. Tushar**, "Understanding customer behaviour in multi-tier demand response management," in *IEEE Access*, vol. 3, pp. 2613-2625, Nov. 2015.
18. N. U. Hassan, Y. Khalid, C. Yuen, and **W. Tushar**, "Customer engagement plans for peak load reduction in residential smart grids," in *IEEE Transactions on Smart Grid*, vol. 6, no. 6, pp. 3029-3041, Mar. 2015.
19. S. Huang, **W. Tushar**, C. Yuen, and K. Otto, "Quantifying economic benefits in the ancillary electricity market for smart appliances in Singapore households," in *Elsevier Sustainable Energy, Grids, and Networks*, vol. 1, pp. 53-62, Mar. 2015.
20. **W. Tushar**, J. A. Zhang, D. B. Smith, H. V. Poor, and S. Thiébaux, "Prioritizing consumers in smart grid: A game theoretic approach," in *IEEE Transactions on Smart Grid*, vol. 5, no. 3, pp. 1429-1438, May 2014.
21. D. B. Smith, M. Portman, W. L. Tan, and **W. Tushar**, "Multi source-destination distributed wireless networks: Pareto-efficient dynamic power control game with rapid convergence," in *IEEE Transactions on Vehicular Technology*, vol. 63, no. 6, pp. 2744-2754, July 2014.
22. **W. Tushar**, W. Saad, H. V. Poor, and D. B. Smith, "Economics of electric vehicle charging: A game theoretic approach," in *IEEE Transactions on Smart Grid*, vol. 3, no. 4, pp. 1767-1778, Dec. 2012.

Conference Publication

1. S. N. Islam, M. A. Mahmud, A. M. T. Oo, C. Yuen and **W. Tushar**, "Paper interference management for cognitive radio enabled smart grid communication," Proc. Of the *IEEE PES Asia-Pacific Power and Energy Engineering Conference (APPEEC)*, Bangalore, India, Nov. 2017.
2. W-T. Li, K. Thirugnanam, **W. Tushar**, C. Yuen, and K. L. Wood, "Optimizing energy consumption of hot water system in buildings with solar thermal systems," in *Proc. of International Conference on Smart Cities and Green ICT Systems (SMARTGREENS)*, Porto, Portugal, Apr. 2017.
3. B. Chai, **W. Tushar**, N. U. Hassan, C. Yuen, and Z. Yang, "Managing energy consumption in buildings through offline and online control of HVAC systems," in *Proc. of IEEE Region 10 Conference (TENCON)*, Singapore, Nov. 2016.
4. S. R. Gubba, W-T. Li, **W. Tushar**, C. Yuen, N. U. Hassan, K. L. Wood, C-K. Wen and H. V. Poor, "Energy management by controlling air conditioning systems in residential settings," in *Proc. Of IEEE Workshop on Environmental, Energy and Structural Monitoring Systems (EESMS)*, Bari, Italy, June 2016.
5. **W. Tushar**, J. A. Zhang, C. Yuen, D. B. Smith and H. V. Poor, "Smart grid energy management for a shared facility controller with renewables," in Proc. of *IEEE International Conference on Smart Grid Communication (SmartGridComm)*, Miami, FL, Nov. 2015.
6. **W. Tushar**, C. Yuen, D. B. Smith, N. U. Hassan, and H. V. Poor, "A canonical coalitional game theoretic approach for energy management for nanogrids," in *Proc. of IEEE Innovative Smart Grid Technologies Asia (ISGT-Asia)*, Bangkok, Thailand, Nov. 2015.
7. A. Shabbir, N. U. Hassan, C. Yuen, A. Ahmed and **W. Tushar**, "Multi-tier incentive scheme for residential participation in demand response management programs," in *Proc. of IEEE Innovative Smart Grid Technologies Asia (ISGT-Asia)*, Bangkok, Thailand, Nov. 2015.
8. **W. Tushar**, C. Yuen, B. Chai, D. B. Smith, and H. V. Poor, "Feasibility of using discriminate pricing scheme for energy trading in smart grid," in *Proc. of IEEE Global Communications Conference (GLOBECOM)*, Austin, TX, Dec. 2014.
9. **W. Tushar**, S. Huang, C. Yuen, J. A. Zhang, and D. B. Smith, "Synthetic generation of solar states for smart grid: A multiple segment Markov chain approach," in *Proc. of IEEE Innovative Smart Grid Technologies Europe (ISGT-Europe)*, Istanbul, Turkey, Oct. 2014.
10. **W. Tushar**, B. Chai, C. Yuen, D. B. Smith, and H. V. Poor, "Energy management for a user interactive smart community: A Stackelberg game approach," in *Proc. of IEEE Innovative Smart Grid Technologies Asia (ISGT-Asia)*, Kuala Lumpur, Malaysia, May 2014.
11. **W. Tushar**, J. A. Zhang, D. B. Smith, S. Thiébaux, and H. V. Poor, "Prioritizing consumers in smart grid: Energy management using game theory," in *Proc. of IEEE International Conference on Communications (ICC)*, Budapest, Hungary, Jun. 2013. - **Best paper**
12. **W. Tushar**, J. A. Zhang, D. B. Smith, H. V. Poor, G. Platt, and S. Durrani, "An efficient energy curtailment scheme for outage management in smart grid," in *Proc. of IEEE Global Communication Conference (GLOBECOM)*, Anaheim, CA, Dec. 2013.
13. **W. Tushar**, D. B. Smith, J. A. Zhang, T. Lamahewa, and T. Abhayapala, "Distributed transmit beamforming: Phase convergence improvement using enhanced one-bit feedback," in *Proc. Of IEEE Wireless Communications and Networking Conference (WCNC)*, Paris, France, Apr. 2012.
14. **W. Tushar**, D. B. Smith, W. Saad, and H. V. Poor, "Distributed transmit beamforming: Performance improvement using two-bit feedback," in *Proc. of International Symposium on Communications and Information Technologies (ISCIT)*, Gold Coast, Australia, Oct. 2012.
15. **W. Tushar**, D. B. Smith, T. Lamahewa, and J. A. Zhang, "Non-cooperative power control game in a multi-source wireless sensor network," in *Proc. of Australian Communications Theory Workshop (AusCTW)*, Wellington, New Zealand, Jan. 2012. - **Best student paper**
16. **W. Tushar**, D. B. Smith, and T. Lamahewa, "Distributed transmit beamforming: Data funneling in wireless sensor network," in *Proc. of Australian Communications Theory Workshop (AusCTW)*, Wellington, New Zealand, Jan. 2012.
17. **W. Tushar** and D. B. Smith, "Distributed transmit beamforming based on a 3-bit feedback system," in *Proc. of IEEE Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, Marrakech, Morocco, June 2010.

18. A. B. Islam, S. Mostofa, **W. Tushar**, and A. B. M. H. Rashid, "Effect of variation of thickness on integrated antenna system in silicon," in *Proc. of International Conference on Information and Computer Technology (ICICT)*, Dhaka, Bangladesh, Mar. 2007. - **Best student paper**

Other Publications

1. **W. Tushar**, S. Basnet, C. Yuen, Y. Xu, and K. L. Wood, "Design innovation for smarter Singapore: A case study on smart energy innovation," in *The Singapore Engineer Magazine*, pp. 18-25, March issue, 2017. - **invited tutorial paper**
2. S. Huang, K. L. Wood, C. Yuen, K. Otto, K. H-Otto, Y. Gu, S. Ahipasaoglu, S. Benjaafar, **W. Tushar**, C. Withanage, T. Wang, A. R. Molla, R. Ashok, and S. Ying, "Innovations in the design of smart grid systems for future cities," in *Complex Systems Design & Management Asia: Designing Smart Cities*, Singapore, 2014. - **Poster**
3. **W. Tushar** and D. B. Smith, "Distributed transmit beamforming using three-bit feedback," in *Australian Communications Theory Workshop (AusCTW)*, ACT, Australia, Feb. 2010. - **Poster**

[Google Scholar](#) (Last update: Dec 04, 2017): 586

Research Collaboration

- Princeton University, USA (with Prof. H. Vincent Poor)
- Virginia Tech, USA (with Prof. Walid Saad)
- Caltech, USA (with Prof. S. H. Low)
- Zhejiang University, China (with Prof. Zaiyue Yang)
- The University of Technology, Sydney (with Prof. Andrew Zhang)
- Australian National University (with Prof. Sylvie Thiébaux; Prof. Thushara Abhayapala; Dr. Salman Durrani)
- Aalto University, Finland (with Prof. Kevin Otto)
- Singapore University of Technology and Design (with Prof. Kristin Wood, Prof. Chau Yuen, Prof. Yunjian Xu)
- Data 61-CSIRO Australia (with Dr. David Smith)
- State Grid Corporation, China (with Dr. Bo Chai)
- Peking University, China (with Prof. Xiang Liu)
- North China Electric Power University, China (with Prof. Nian Liu)
- National Sun Tai-Sen University, China (with Prof. Chao-Kai Wen)
- Lahore University of Management and Science, Pakistan (with Prof. Naveed Ul Hassan)
- Power Automation, Singapore (with Mr. See Gim Kerk, Head, Smart Grid)
- Singapore Ministry of Home Affairs (with Dr. Shisheng Huang)

Mentoring and Research Supervision

Mentoring Postdoc

- Dr. Kannan Thiruganam, SUTD, Singapore.

Mentoring Ph.D. Students

- Dr. Bo Chai, Zhejiang University, Hangzhou, China (mentored in 2013-2014). Bo Chai came to SUTD for working on the same project I was involved and I guided him to be familiar with the system model, formulation of problems, and designing solution concept for the desired energy management mechanism. Currently, he is a researcher at State Grid Global Energy Interconnection Research Institute, Beijing, China.
- Mr. Batchu

Mentoring Research Assistants

- Selina Patra, SUTD, 2015. Selina worked on an STB funded project in which I am involved as a Co-CI. Currently, Selina is a Research Engineer at SUTD.
- Shawn Kong, SUTD, 2015. Shawn worked on an STB funded project in which I am involved as a Co-CI. Currently, Shawn is a software engineer at DBS Bank, Singapore.
- Lan Lan, SUTD, IDC, 2016-2017: Lan Lan worked with me in multiple projects. She is a research engineer at IDC.
- Sng Hui En Karen, SUTD, IDC, 2015-2016. Karen worked with me in designing a toolset for energy audit in commercial buildings in Singapore. She is a research manager at IDC.

Service and Discipline Involvement

- **Technical Reviewer for Journals:** IEEE Transactions on Smart Grid, IEEE Transactions on Industrial Informatics, IEEE Transactions on Vehicular Technology, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Intelligent Transportation Systems, IEEE Wireless Communications Magazine, IEEE Systems Journal, Ad Hoc and Sensor Wireless Networks, Elsevier Performance Evaluation, IET Generation, Transmission and Distribution, ACM Transactions on Embedded Computing System, IEEE Transactions on Sustainable Energy.
- **Technical Reviewer for Conferences:** INFOCOM 2013, GLOBECOM 2013, SMARTGRIDCOMM 2013, 2014, 2015, ICC 2014, CDC 2014, ICC 2016, TENCON 2016, ACC2016.
- **Evaluation Committee Board Member (2015-16):** The construction of IDC funded power grid test-bed EPIC at SUTD.

Teaching Contribution

- **Academic Tutor (Apr. 2009 - Dec. 2012):** I worked as a part-time academic tutor and lab demonstrator at the School of engineering in ANU for three and a half years. As a tutor, I contributed by conducting tutorial and lab classes and help students including solving problems to understand the course and supervise them to conduct the experiments. Further, I examined the reports and marked them and assisted the Course Instructors to prepare the mark sheet of the respective courses. I participated in Graduate Teaching Program (GTP) and Teaching Quality Program (TQP) during my tutorship at ANU.
- **Lecturer (June 2007-Mar. 2009):** I worked as a Lecturer at Presidency University in Bangladesh for 21 months. As a Lecturer, I was involved in preparing and delivering course lecture, preparing examination questions, conducting examinations, hardware and software laboratory classes, marking the assignments and exam scripts, assessing the lab performance of the students,

preparing lab manuals, course outlines and contents, and advising students on their education/course/examination related queries. I participated in a Faculty Development Program at Presidency in 2008.

Reference

Prof. Tapan Saha

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Prof. Kristin L Wood

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