Curriculum Vitae

Chee-Wooi Ten, Ph.D.
Professor of Electrical Engineering
Department of Electrical and Computer Engineering
Affiliated Professor
Department of Applied Computing
Michigan Tech

1.0 PERSONAL DATA

Name	:	Chee-Wooi Ten (鄧志威-pinyin: dèng zhì weī)
Address	:	1400 Townsend Drive, EERC 235, Houghton, MI 49931-1295
Citizenship	:	US Naturalized Citizen
Languages	:	English, Malay, Mandarin, Hokkien, and Cantonese
E-mail	:	ten@mtu.edu
Webpage	:	http://www.ece.mtu.edu/~ten/
Hobbies	:	Badminton (The most competitive), basketball, downhill skiing, cooking, violin, fishing.

2.0 EDUCATION

Doctor of Philosophy in Electrical Engineering, University College Dublin (Ireland), Class of 2009.
- Ph.D. Dissertation: "*New Vulnerability Assessment and Anomaly Correlation Methods for the Power Infrastructure Cyber Networks.*"
- **Adviser: Profs. Chen-Ching Liu and Manimaran Govindarasu**
- Period of study: *Spring 2006 – Fall 2009*
  - o Final Oral Examination (Viva Voce) (Defended on November 2, 2009)
  - o Preliminary Examination (Spring 2008)
  - o Ph.D. Qualifying Examination (Fall 2005)

Master of Science in Electrical Engineering, Iowa State University (USA), Class of 2001.
- Emphasis: Computer applications for power systems
- Thesis: "*Visualization Techniques of On-Line Risk-Based Security Assessment (OL-RBSA).*"
- **Adviser: Prof. James D. McCalley**
- Period of study: *Spring 2000 – Fall 2001*

Bachelor of Science in Electrical Engineering, Iowa State University (USA), Class of 1999.
- Emphasis: Computer System Engineering
- Senior Design Project: "*Implementation of User Interface for Voltage Stability Subroutine.*"
- **Adviser: Prof. Venkataramana Ajjarapu**
- Period of study: *Spring 1997 – Fall 1999*

Associate Degree in General Engineering, INTI College (Subang Jaya, Malaysia), Class of 1997.
- Matriculation Emphasis: Engineering for American University Program (AUP)
- Period of study: *January 1996 – June 1997*

3.0 EXPERIENCE

3.1 Research Interests
- Security protection for power substations
- Cyber-physical system of critical infrastructure systems
- Anomaly detection of synchrophasor patterns
- Future control center framework
- Distribution management and automation
- Smart home technologies
- Geographic information system

3.2 Tenure-Track Faculty/Visiting Position
1. **Professor of Electrical Engineering**, Electrical and Computer Engineering Department Michigan Technological University, (*2022 – Present*)
2. **Affiliated Associate Professor of Electrical Engineering**, Applied Computing Department Michigan Technological University, (*2021 – 2022*)
3. **Associate Professor of Electrical Engineering**, Electrical and Computer Engineering Department Michigan Technological University, (*2016 – 2022*)

4. **Assistant Professor of Electrical Engineering**, Electrical and Computer Engineering Department, Michigan Technological University, (*2010–2016*)
5. **Visiting Faculty of Electrical Engineering**, Electrical and Computer Engineering Department Carnegie Mellon University, (*2018 –2019*)

3.3 Industry Work Experience
Application Engineer: Siemens Energy Automation, Singapore (*2002 –2005*)
- Developed *Geographic Information System Importation Tools (GISIT)* for Siemens Spectrum PowerCC (Windows platform).
  - o Extract topological information from GIS Shapefile (One of the file formats from ESRI). This extraction conforms with common information model (CIM) in PowerCC platform.
  - o Adapted template method to input or output the XML related files, including the recent trend of Scalable Vector Graphics (SVG) - This is collaboration with Siemens Switzerland (Previously as Telegyr).
  - o Introduced Communication Front End (CFE) Template to link the CIM instances.
- Developed CIM-based data comparator (Incremental Updates) for GIS output copies to avoid complete dataset import to the system with implementation of recursive exhaustive technique to compare copies (Copy0 and Copy1).
- Enhanced Distribution Management System (DMS) user interface with the specific requirement from projects.
- Developed Customer Information System user interface with Trouble Call System.
- Implemented Quality Indices for SAIDI, SAIFI, and CAIDI using Visual Basic Application (VBA), including different zones and events.
- Developed Network Application IDDUG file generator using VBA (*Mar. 2002 – Apr. 2002*).
- Collaborated with Siemens, Nuremberg, Germany including technical knowledge transfer / development in Siemens PowerCC DMS applications. (Trip to Nuremberg *Oct. 2002 – Dec. 2002*; *May 2003 – Sep. 2003* under Dr. Guenter Beissler and Mr. Markus Reischboeck's supervisions) This includes C++ source code maintenance that have been written in UNIX after code migration to Windows platform, in: (1) *Distribution System Power Flow*, (2) *Fault Location*, (3) *Fault Isolation and Service Restoration*, (4) *Outage Management System*, (5) *Trouble Call System*, and (6) *Crew Management System*.
- Participated in a joint effort on *Distribution Short Circuit* module with Siemens EMIS, Minneapolis (Trip to Minneapolis *Sep. 2003 - Nov. 2003* under Mr. Dong Li's supervision).
- Participated in project Specific Enhancement to ETAP for Nanhai Shell project - To acquire all the switching device status from SCADA (PowerCC) to ETAP software using Visual Basic.
- This development is to periodically update / manually trigger the latest switch status from SCADA to ETAP for case studies.
- Enhanced wttran enhancement: ***wttran*** is part of Siemens proprietary subroutine for SINAUT Spectrum (UNIX system) to extract GIS-related information from AutoCAD (DXF format) to Siemens format, i.e., IDDUG for topology and **Autograph** for graphics output. Technical knowledge exchange with Siemens Vienna (Trip to Vienna in *Feb. 2005* under Mr. Helmut Klein's supervision).

EMS Analyst Intern: MidAmerican Energy Company in control center, Des Moines, IA (*May 2000 – Aug. 2000*)
- EMS database maintenance, especially involved in designing user interface for the text mining from remote terminal units (RTUs) to Excel Spreadsheet.
- Implemented the user interface using MS Visual Basic.

3.4 Academic Assistance
Graduate Teaching and Research Assistant: Iowa State University and University College Dublin (*Between 1999—2001 and 2005—2009*)
- Helped Iowa State faculty members to negotiate with Siemens PTD Energy Automation (Minnetonka, Minnesota) on energy management system (EMS) for a testbed setup. This testbed includes the Ethernet-based substations (IEC61850) with control center network through DNP3.0i. It also facilitates the emulation of utility SCADA environment to study attack and defense mechanisms. The ECE department at Iowa State University has committed to this project.
- Collaborated research with CESI Ricerca, Italy (http://www.cesiricerca.it), by incorporating the current analytical approach into comprehensive cybersecurity assessment framework as the foundation for future development of defense strategies. (*Jul. 2008 – Jun. 2009*).
- Worked as a graduate research assistant (GRA) (*Jan. 2006 - Nov. 2009*) on cybersecurity for power infrastructure.

- Worked for IEEE Power Engineering Society (PES) workforce project (*Apr. 2007 – Dec. 2007*) to identify and determine the software vendors of the portal page for students, employers, and faculty members with respect to budget constraints. This work is under supervision of Dr. Dennis Ray and Prof. Chen-Ching Liu. Website URL: http://www.pes-careers.org.
- Worked as a webmaster responsible for classes at ISU using WebCT; EE455 (Fall 2006), EE457 (Spring 2007).
- Worked as GRA (*Aug. 2005 – Dec. 2005*) on the research tasks related to economic-related especially for the transportation similar problems for Locational Marginal Prices (LMP) in power system network. This research was supervised by Prof. Gerald Sheble.
- Administrated the PowerLearn website (*Nov. 2000 – Dec. 2001*) to maintain the website, deployed power educational modules, and developed client-server site scripting using Active Server Page (ASP).
- Administrated the PowerLearn website (*Jun. 1999 – Dec. 1999*) to enhance and re-organize all the module materials, MATLAB simulators. Website URL: http://powerlearn.ece.iastate.edu.
- Graded exam and homework for EE251, an introduction course to the modern power system at sophomore level. (*Aug. 1999 – Dec. 1999*).

4.0 PUBLICATIONS
Asterisk (*) indicates as co-author with advisees; **hash tag (#)** indicates as co-author with Ph.D./Master's advisors; and **Double (**)** indicates as corresponding author. Key interdisciplinary collaborators are colored in **brown**.

4.1 Books:
1. **Chee-Wooi Ten**** and **Yachen Tang***, "Electric Power: Distribution Emergency Operation," The intent of this graduate textbook is for Distribution Engineering II, CRC Press. Sep. 2018, 1st Ed. <ISBN: 9781498798945>
2. Turan Gönen, **Chee-Wooi Ten****, and **Ali Mehrizi-Sani**, "Electric Power Distribution System Engineering," 4th Edition CRC, March 22, 2024
3. Turan Gönen, **Chee-Wooi Ten****, and **Yunhe Hou**, "Modern Power System Analysis," 3rd Edition, CRC, March 18, 2022

4.2 Book Chapters:
1. **Koji Yamashita*****, **Chee-Wooi Ten**, and **Lingfeng Wang**, "Dynamical Analysis of Cyber-Related Contingencies Initiated from Substations," under special edition of "Security for Cyber-Physical Systems: Vulnerability and Impact," edited by Hadis Karimipour, Pirathayini Srikantha, Hany Farag, and Jin Wei-Kocsis (the editors), pp. 223-246, Springer Publishing, July **2020**. <10.1007/978-3-030-45541-5_12>
2. **Nathan Lau****, Hao Wang, Ryan Gerdes, and **Chee-Wooi Ten**, "Securing Supervisory Control and Data Acquisition Control Systems," In A. Moallem (Ed.), Human Computer Interaction in Cybersecurity Handbook. Boca Raton, FL, USA: CRC Press, Oct. **2018**. <10.1201/b22142-12>
3. **Chee-Wooi Ten**** and **Yonghe Guo***, "Cybersecurity of Distribution Devices and Systems," in the Smart Grid Handbook, edited by Chen-Ching Liu, Stephen McArthur, and Seung-Jae Lee. Chichester, UK: John Wiley & Sons, Ltd, **2016**, pp. 891-904. <10.1002/9781118755471.SGD011>

4.3 Critically Reviewed Journal Papers (Listed First-Tier Transactions Only):
(Under review or in preparation)
1. **Anurag Nagpure***, **Anamika Dubey**, and **Chee-Wooi Ten**, "Reserve Engineering of Short Circuit."
2. **Yachen Tang***, **Ron Brash**, Longfei Wei, and **Chee-Wooi Ten**, "Inference of Metering Discrepancy Between Primary and Secondary Distribution Networks."
3. Omar Abdulla Abdelghany Sinoussy, **Sook-Chin Yip***, Ming-Tao Gan, Wooi-Nee Tan, and **Chee-Wooi Ten**, "VDETECT: A VGG-Inspired Model for Delay-Minimized Electricity Theft Detection."
4. **Lawrence Dilworth***, **Chee-Wooi Ten**, and Flavio Costa, "Cyber-Informed Transmission Planning Incorporating Security Violations and Cascading," Electric Power Systems Research (EPSR) to PSCC.

(Published)
1. **Anna Stuhlmacher**, Chee-Wooi Ten, **Lawrence Dilworth***, and **Yachen Tang***, "Operational Planning for Emerging Distribution Systems: A Unique Perspective on Grid Expansion," Foundations and Trends **2024**. <10.1561/3100000033>.
2. **Zhiyuan Yang***, Shipeng Zhang, **Chee-Wooi Ten**, Ting Liu, Hao Sun, and Xueyue Pang, "Implementation of Risk-Aggregated Substation Testbed Using Generative Adversarial Networks." *IEEE Transactions on Smart Grid*, vol. 14, no. 1, pp. 677-689, Jan. **2023**. <10.1109/TSG.2022.3192522>.

3. Pikkin Lau, **Lingfeng Wang***, Wei Wei, Zhaoxi Liu, and **Chee-Wooi Ten**, "A Novel Mutual Insurance Model for Hedging Against Cyber Risks in Power Systems Deploying Smart Technologies." *IEEE Transactions on Power Systems*, vol. 38, no. 1, pp. 630-642, Jan. **2023**. <10.1109/TPWRS.2022.3164628>.

4. **Koji Yamashita***, **Zhiyuan Yang***, **Chee-Wooi Ten**, **Soummya Kar**, and Andrew Ginter, "Cascading Verification and Mitigation Initiated by the Switching Attacks through Compromised Digital Relays." (Accepted on March 1, **2022**) *IET Smart Grid (Open Access)*. <10.1049/stg2.12062>

5. **Diego Aponte***, **Chee-Wooi Ten**, Wayne Weaver, "Estimation of Affected Customers and Load Loss Under Wind Storms in the Caribbean Region." *IEEE Systems Journal*, vol. 16, no. 2, pp. 3226-3236, Jun. **2022**. <10.1109/JSYST.2021.3113814>

6. Pikkin Lau, **Lingfeng Wang**, Zhaoxi Liu, Wei Wei, and **Chee-Wooi Ten**, "A Coalitional Cyber-Insurance Design Considering Power System Reliability and Cyber Vulnerability." *IEEE Transactions on Power Systems*, vol. 36, no. 6, pp. 5512-5524, May **2021**. <10.1109/TPWRS.2021.3078730>

7. **Junho Hong***, Ramya Karnati, **Chee-Wooi Ten**, Soonwoo Lee, and Sungsoo Choi, "Implementation of Secure Sampled Value (SeSV) Message in Substation Automation System." *IEEE Transactions on Power Delivery*, vol. 37, no. 1, pp. 405-414, Feb. **2021**. <10.1109/TPWRD.2021.3061205>

8. Zhaoxi Liu, Wei Wei, **Lingfeng Wang**, **Chee-Wooi Ten**, and Yeonwoo Rho, "An Actuarial Framework for Power System Reliability Considering Cybersecurity Threats." *IEEE Transactions on Power Systems*, vol. 36, no. 2, pp. 851-864, Mar. **2021**. <10.1109/TPWRS.2020.3018701>

9. Pikkin Lau, Wei Wei, **Lingfeng Wang****, Zhaoxi Liu, and **Chee-Wooi Ten**, "A Cybersecurity Insurance Model for Power System Reliability Considering Optimal Defense Resource Allocation." *IEEE Transactions on Smart Grid*, vol. 11, no. 4, pp. 4403- 4414, Sep. **2020**. <10.1109/TSG.2020.2992782>

10. **Koji Yamashita***, **Chee-Wooi Ten****, Yeonwoo Rho, Lingfeng Wang, Wei Wei, and **Andrew Ginter**, "Measuring Systemic Risk of Switching Attacks based on Cybersecurity Technologies in Substations," *IEEE Transactions on Power Systems*, vol. 35, no. 6, pp. 4206-4219, Nov. **2020** <10.1109/TPWRS.2020.2986452>

11. **Zhiyuan Yang***, Yun Liu, Meghan Campbell, **Chee-Wooi Ten****, Yeonwoo Rho, Lingfeng Wang, and **Wei Wei**, "Premium Calculation for Insurance Businesses Based on Cyber Risks in IP-Based Power Substations." *IEEE Access*, vol. 8, no. 1, pp. 78890-78900, Dec. **2020** <10.1109/ACCESS.2020.2988548>

12. **Yachen Tang***, Shuaidong Zhao, **Chee-Wooi Ten****, **Kuilin Zhang**, and Thillainathan Logenthiran, "Establishment of Enhanced Load Modeling by Correlating with Occupancy Information," *IEEE Transactions on Smart Grid*, vol. 11, no. 2, pp. 1702-1713, Mar. **2020** <10.1109/TSG.2019.2942581>

13. **Chee-Wooi Ten****, "Grid Security Challenges Ahead," IEEE Smart Grid Newsletter, July 2018.

14. **Kevin P. Schneider****, Barry Mather, Bikesh C. Pal, **Chee-Wooi Ten**, Greg Shirek, Hao Zhu, Jason Fuller, José Luiz Rezende Pereira, Luis F. Ochoa, Leandro Ramos de Araujo, Roger C. Dugan, Sumit Paudyal, Thomas E. McDermott, and William Kersting, "Analytic Considerations and Design Basis for the IEEE Distribution Test Feeders," *IEEE Transactions on Power Systems*, vol. 33, no. 3, pp. 3181—3188, May **2018**. <10.1109/TPWRS.2017.2760011> (**One of the most popular papers in February 2021**)

15. **Zhiyuan Yang*****, **Chee-Wooi Ten**, and **Andrew Ginter**, "Extended Enumeration of Hypothesized Substations Outages Incorporating Implications of Overloading," *IEEE Transactions on Smart Grid*, vol. 9, no. 6, pp. 6929—6938, Nov. **2018** <10.1109/TSG.2017.2728792>

16. Chong Wang**, **Chee-Wooi Ten**, and **Yunhe Hou**, "Inference of Compromised Synchrophasor Units Within Substation Control Networks," *IEEE Transactions on Smart Grid*, vol. 9, no. 6, pp. 5831—5842, Nov. **2018** <10.1109/TSG.2017.2697449>

17. **Chee-Wooi Ten****, **Koji Yamashita***, **Zhiyuan Yang***, Athanasios Vasilakos, and Andrew Ginter, "Impact Assessment of Hypothesized Cyberattacks on Interconnected Bulk Power Systems," *IEEE Transactions on Smart Grid*, vol. 9, no. 5, pp. 4405—4425, Sep. **2018**. <10.1109/TSG.2017.2656068>

18. Chong Wang, Yunhe Hou**, and **Chee-Wooi Ten**, "Determination of Nash Equilibrium Based on Plausible Attack/Defense Event Strategies," *IEEE Transactions on Power Systems*, vol. 32, no. 5, pp. 3670—3680, Sep. **2017**. <10.1109/TPWRS.2016.2635156>

19. Chong Wang, **Chee-Wooi Ten****, **Yunhe Hou**, and Andrew Ginter, "Cyber Inference System for Substation Anomalies Against Alter-and-Hide Attacks," *IEEE Transactions on Power Systems*, vol. 32, no. 2, pp. 896—909, Mar. **2017**. <10.1109/TPWRS.2016.2574769>

20. Yichi Zhang, **Lingfeng Wang****, Yingmeng Xiang, and **Chee-Wooi Ten**, "Inclusion of SCADA Cyber Vulnerability in Power System Reliability Assessment Considering Optimal Resources Allocation," *IEEE Transactions on Power Systems*, vol. 31, no. 6, pp. 4379—4394, Nov. **2016**. <10.1109/TPWRS.2015.2510626>

21. **Yonghe Guo***, **Chee-Wooi Ten****, Shiyan Hu, and **Wayne Weaver**, "Preventive Maintenance for Advanced Metering Infrastructure Against Malware Propagation," *IEEE Transactions on Smart Grid*, vol. 7, no. 3, pp. 1314—1328, May 2016. <10.1109/TSG.2015.2453342>

22. **Chee-Wooi Ten****, Andrew Ginter, and **Rashiduzzaman Bulbul***, "Cyber-Based Contingency Analysis," *IEEE Transactions on Power Systems*, vol. 31, no. 4, pp. 3040—3050, Sep. **2015**. <10.1109/TPWRS.2015.2482364>

23. Yichi Zhang, **Lingfeng Wang****, Yingmeng Xiang, and **Chee-Wooi Ten**, "Power System Reliability Evaluation with SCADA Cybersecurity Considerations," *IEEE Transactions on Smart Grid*, vol. 6, no. 4, pp. 1707—1721, Jul. **2015**. <10.1109/TSG.2015.2396994>

24. **Yachen Tang***, **Chee-Wooi Ten****, Chaoli Wang, and **Gordon Parker**, "Extraction of Energy Information from Analog Meters Using Image Processing" *IEEE Transactions on Smart Grid under "Special Issue: Monitoring, Visualization, and State Estimation for Distribution Systems*," vol. 6, no. 4, pp. 2032—2040, Jul. **2015**. <10.1109/TSG.2015.2388586>

25. **Rashiduzzaman Bulbul***, **Pingal Sapkota***, **Chee-Wooi Ten****, Lingfeng Wang, and **Andrew Ginter**, "Intrusion Evaluation of Communication Network Architectures for Power Substations," *IEEE Transactions on Power Delivery*, vol. 30, no. 3, pp. 1372—1382, Jun. **2015**. <10.1109/TPWRD.2015.2409887>

26. **Yonghe Guo***, **Chee-Wooi Ten****, and **Panida Jirutitijaroen**, "Online Data Validation for Distribution Operations Against Cybertampering," *IEEE Transactions on Power Systems*, vol. 29, no. 2, pp. 550—560, Mar. **2014**. <10.1109/TPWRS.2013.2282931>

27. Chen Liao, **Chee-Wooi Ten****, and **Shiyan Hu**, "Strategic FRTU Deployment Considering Cybersecurity in Secondary Distribution Network," *IEEE Transactions on Smart Grid*, vol. 4, no. 3, pp. 1264—1274, Sep. **2013**. <10.1109/TSG.2013.2256939>

28. **Chee-Wooi Ten**, **Junho Hong****, and **Chen-Ching Liu#**, "Anomaly Detection for Cybersecurity of the Substations," *IEEE Transactions on Smart Grid*, vol. 2, no. 4, pp. 865—873, Dec. **2011**. <10.1109/TSG.2011.2159406>

29. **Chee-Wooi Ten****, **Manimaran Govindarasu#**, and **Chen-Ching Liu#**, "Cybersecurity for Critical Infrastructures: Attack and Defense Modeling," *IEEE Transactions on Systems, Man, and Cybernetics*, vol. 40, no. 4, pp. 853—865, Jul. **2010**. <10.1109/TSMCA.2010.2048028> (**One of the most popular papers in February 2021**)

30. **Chee-Wooi Ten****, **Chen-Ching Liu#**, and **Manimaran Govindarasu#**, "Vulnerability Assessment of Cybersecurity for SCADA Systems," *IEEE Transactions on Power Systems*, vol. 23, no. 4, pp. 1836—1846, Nov. **2008**. <10.1109/TPWRS.2008.2002298> (**One of the most popular papers in February 2021**)

31. **Chee-Wooi Ten****, Erich Wuergler, Hans-Joachim Diehl, and **Hoay Beng Gooi**, "Extraction of Geospatial Topology and Graphics for Distribution Automation Framework," *IEEE Transactions on Power Systems*, vol. 23, no. 4, pp. 1776—1782, Nov. **2008**. <10.1109/TPWRS.2008.2004835>

32. Xia Yang, **Myeon-Song Choi**, Seung-Jae Lee, **Chee-Wooi Ten****, and Seong-Il Lim, "Fault Location for Underground Power Cable Using Distributed Parameter Approach," *IEEE Transactions on Power Systems*, vol. 23, no. 4, pp. 1809—1816, Nov. **2008**. <10.1109/TPWRS.2008.2002289>

33. **Ming Ni**, **James D. McCalley#****, Vijay Vittal, Scott Greene, **Chee-Wooi Ten**, Vijaya Sudhakar Ganugula, and Tayyib Tayyib, "Software Implementation of On-Line Risk-Based Security Assessment," *IEEE Transactions on Power Systems*, vol. 18, no. 3, pp. 1165—1172, Aug. **2003**. <10.1109/TPWRS.2003.814909>

4.4 International Conference Papers:

1. **Anurag Nagpure***, Anamika Dubey, and **Chee-Wooi Ten**, "Bisection Search of Faulted Segment Based on Radially Energized Distribution Feeder" in Proc. North American Power Symposium (NAPS), Nov. 14 –16, 2021, College Station, TX, USA.

2. Xing Ling, **Yeonwoo Rho**, and **Chee-Wooi Ten**, "Predicting Global Trend of Cybersecurity on Continental Honeynets Using Vector Autoregression," in *Proc. IEEE PES Innovative Smart Grid Technologies Europe (ISGT-Europe)*, Sep. 29—Oct. 2, 2019, Bucharest, Romania.

3. **Yachen Tang***, **Chee-Wooi Ten**, and **Kevin P. Schneider**, "Inference of Tampered Smart Meters with Validations from Feeder-Level Power Injections," in *Proc. IEEE PES Innovative Smart Grid Technologies— Smart Grid Links Future*, May 21—May 24, 2019, Chengdu, China

4. **Zhiyuan Yang*** and **Chee-Wooi Ten**, "Cyber-Induced Risk Modeling for Microprocessor-Based Relays in Substations," in *Proc. IEEE PES Innovative Smart Grid Technologies for Smart Nations*, May. 22—25, 2018, Singapore.

5. **Yachen Tang***, **Chee-Wooi Ten**, and Laura Brown, "Graph-Theoretic Strategy for Fraud Detection Using Reconfiguration Switching Schemes," in *Proc. Resilience Week*, Sep. 18—22, 2017, Wilmington, DE, USA.

6. **Zhiyuan Yang*** and **Chee-Wooi Ten**, "Assessment of Hypothesized Substation Cyberattack Using Linearized Power Flow Approach," in *Proc. IEEE PES Conference on Innovative Smart Grid Technologies*, Apr. 23—26, 2017, Washington, DC, USA.

7. **Yachen Tang***, Shuaidong Zhao, **Chee-Wooi Ten**, and **Kuilin Zhang**, "Enhancement of Distribution Load Modeling Using Statistical Hybrid Regression," in *Proc. IEEE PES Conference on Innovative Smart Grid Technologies*, Apr. 23—26, 2017, Washington, DC, USA.
8. **Rashiduzzaman Bulbul***, **Chee-Wooi Ten**, and **Lingfeng Wang**, "Prioritization of MTTC-Based Combinatorial Evaluation for Hypothesized Substations Outages," in *Proc. IEEE PES General Meeting*, Jul. 26—30, 2015, Denver, CO, USA.
9. **Yonghe Guo***, **Chee-Wooi Ten**, **Shiyan Hu**, and Wayne Weaver, "Modeling Distributed Denial of Service Attack in Advanced Metering Infrastructure," in *Proc. IEEE PES Conference on Innovative Smart Grid Technologies*, Feb. 17—20, 2015, Washington, DC, USA.
10. **Rashiduzzaman Bulbul***, Yuan Gong, **Chee-Wooi Ten**, Andrew Ginter, and **Shengwei Mei**, "Impact Quantification of Hypothesized Attack Scenarios on Bus Differential Relays," in *Proc.18th Power System Computation Conference (PSCC)*, Aug. 18—22, 2014, Wroclaw, Poland.
11. **Rashiduzzaman Bulbul***, **Chee-Wooi Ten**, and **Andrew Ginter**, "Risk Evaluation for Hypothesized Multiple Busbar Outages," in *Proc. IEEE-PES General Meeting-2014*, Jul. 27—31, 2014, National Harbor, MD, USA.
12. **Rashiduzzaman Bulbul***, **Chee-Wooi Ten**, and **Andrew Ginter**, "Cyber-Contingency Evaluation for Multiple Hypothesized Substation Outages," in *Proc. IEEE PES Conference on Innovative Smart Grid Technologies*, Feb. 19—22, 2014, Washington, DC, USA.
13. **Bhairavi Pandya*** and **Chee-Wooi Ten**, "Online Management Framework for Distribution System With Wind Generation," in *Proc. IEEE PES Great Lakes Symposium on Smart Grid and New Energy Economy*, Sep. 24—26, 2012, Chicago, IL, USA.
14. **Yonghe Guo*** and **Chee-Wooi Ten**, "Electricity Fraud Detection by Incorporating PV System Using Support Vector Machines," in *Proc. IEEE PES Great Lakes Symposium on Smart Grid and New Energy Economy*, Sep. 24—26, 2012, Chicago, IL, USA.
15. **Pingal Sapkota*** and **Chee-Wooi Ten**, "Substation Cybersecurity Architectural Design," in *Proc. IEEE PES Great Lakes Symposium on Smart Grid and New Energy Economy*, Sep. 24—26, 2012, Chicago, IL, USA.
16. **Nathan S. Fettinger***, **Chee-Wooi Ten**, and **Chunxiao Chigan**, "Minimizing Distribution System Operating Costs through Intelligently Scheduled PHEV Charging," in *Proc. IEEE Transportation Electrification Conference and Expo (ITEC)*, Jun. 18—20, 2012, Dearborn, MI, USA.
17. **Yonghe Guo***, **Chee-Wooi Ten**, and Panida Jirutitijaroen, "Data Integrity Validation Framework for Distribution System Operations," in *Proc. 7th Cyber Security and Information Intelligence Research (CSIIR) Workshop*, Oct. 12—14, 2011, Oak Ridge, TN, USA.
18. Yin Hong Chang, **Panida Jirutitijaroen**, and **Chee-Wooi Ten**, "A Simulation Model of Cyber Threats for Energy Metering Devices in a Secondary Distribution Network," in *Proc. 5th International CRIS conference on Critical Infrastructures*, September 20—22, 2010, Beijing, China.
19. **Chen-Ching Liu#**, **Chee-Wooi Ten**, and **Manimaran Govindarasu#**, "Cybersecurity of SCADA Systems: Vulnerability Assessment and Mitigation," in *Proc. IEEE PES Power Systems Conference and Exposition (PSCE)*, 2009, Mar. 15—18, 2009, Seattle, WA, USA.
20. **Chee-Wooi Ten**, **Chen-Ching Liu#**, and **Manimaran Govindarasu#**, "Anomaly Extraction and Correlations for Power Infrastructure Cyber Systems," in *Proc. IEEE eNetworks Cyberengineering Workshop on Systems, Man, and Cybernetics*, Oct. 12—15, 2008, Singapore.
21. **Chee-Wooi Ten**, **Chen-Ching Liu#**, and **Manimaran Govindarasu#**, "Cyber-Vulnerability of Power Grid Monitoring and Control Systems," in *Proc. 4th Cyber Security and Information Intelligence Research (CSIIR) Workshop*, May 12—14, 2008, Oak Ridge, TN, USA.
22. **Chee-Wooi Ten**, **Manimaran Govindarasu#**, and **Chen-Ching Liu#**, "Cybersecurity for Electric Power Control and Automation Systems," in *Proc. IEEE eNetworks Cyberengineering Workshop on Systems, Man, and Cybernetics*, IEEE-SMC 2007, Oct. 7—10, 2007, Montreal, Canada.
23. **Chee-Wooi Ten**, **Chen-Ching Liu#**, and **Manimaran Govindarasu#**, "Vulnerability Assessment of Cybersecurity for SCADA Systems Using Attack Trees," in *Proc. IEEE Power and Energy Society General Meeting 2007*, Jun. 24—28, 2007, Tampa, FL, USA.

4.5 Posters:

- **Andrew Drees***, **Chee-Wooi Ten**, and Bruce Mork, "Michigan Tech Power Engineering Education and Research," Graduate Education Day highlighting Michigan's Best and Brightest – presented to *Michigan Senator at State Capitol*, Mar. 29, 2012, Lansing, MI, USA.
- **Yonghe Guo***, **Chee-Wooi Ten**, and Panida Jirutitijaroen, "Data Integrity Validation Framework for Distribution System Operations," *Seventh Cyber Security and Information Intelligence Research (CSIIR) Workshop*, Oct. 12-14, 2011, Oak Ridge, TN, USA. (Won the First Prize Poster Award).

- **Andrew Drees***, **Chee-Wooi Ten**, and Bruce Mork, "Campus-Wide Smart Grid Infrastructure and Enhancement: Preliminary Study on Existing Distribution Grid," *IEEE Power and Energy Society General Meeting*, July 25, 2011, Detroit, MI, USA.
- Shinn-Shyan Wu, Junho Hong, **Chee-Wooi Ten**, and **Chen-Ching Liu#**, "Enhancing Energy Control Center Cybersecurity - Real-Time Monitoring, Anomlay Detection, Impact Analysis, and Mitigation Strategies (RAIM)," *TCD - UCD Design Innovation*, April 27, 2010, Dublin, Ireland.
- **Chee-Wooi Ten**, Muthuprasanna M., Matthew L. Weber, **Chen-Ching Liu#**, and **Manimaran Govindarasu#**, "Cybersecurity for Electric Power Control and Automation Systems," *ECpE Poster Session of External Advisory Board (EAB) Meeting*, April 25, 2006, Ames, IA, USA.

4.6 Technical Report:
- Eddy Trinklein, Gordon Parker, Wayne Weaver, Rush Robinett, Lucia Gauchia Babe, **Chee-Wooi Ten**, Ward Bower, Steve Glover, and Steve Bukowski, "Scoping Study: Networked Microgrids," Sandia National Laboratories Report, SAND2014-17718, Sep. 2014.
- **Chee-Wooi Ten**, "Utility's Cyber Risk Management," *Protect our Power* Report, August 31, 2020.

4.7 Invited Presentations/Panels:
1. **Chee-Wooi Ten**, "Risk Management for Cyber-Physical Systems of Interconnected Power Grid" *Presented to Institute for Sensing and Embedded Network Systems Engineering (I-SENSE) of Florida Atlantic University*, Boca Raton, FL, USA, Oct. 19, 2023.
2. **Chee-Wooi Ten**, Flavio Costa, Alexandra Newman, and Daniel Bienstock "How Non-Convergent Power Flow Cases Inform Planners: Hypotheses on Cyber-Induced Contingency" *Presented to Power Systems Engineering Research Center (PSERC) Summer Workshop,* Houghton, MI, USA, Jul. 31 — Aug. 1, 2023.
3. **Chee-Wooi Ten**, "Extended Contingencies Against Coordinated Attacks" *Presented to Power Systems Engineering Research Center (PSERC) Summer Tutorial (1.5 hours),* [Online], USA, Jul. 26, 2023.
4. **Chee-Wooi Ten**, "Strategic Investment Planning for Cyberinfrastructure" *Presented to Power Systems Engineering Research Center (PSERC) Webinar,* [Online], Jan. 25, 2022.
5. **Chee-Wooi Ten**, co-presented with Prof. Junqiao Qiu "Attack Combinations" *Presented to CS Department Lecture, Michigan Technological University*, Houghton, MI, USA, Nov. 19, 2021.
6. **Chee-Wooi Ten**, "How does cybersecurity actuarial science inform risk hedging between utilities and insurers?" *Presented to Institute of Public Utilities (IPU) Grid School, Michigan State University*, East Lansing, MI, USA, Sep. 29, 2021.
7. **Chee-Wooi Ten**, "IT/OT Convergence in Power Industry," *Presented to IEEE R4 Section 27 Webinar #2* chaired by Prof. Aurenice Oliveira, May 13, 2021, 6:30pm. This event is regular event for IEEE Northeastern Wisconsin region.
8. **Chee-Wooi Ten**, "Session 2: Privacy and Cyber-Physical Security," co-moderating with Prof. Kate Davis of Texas A&M University *Presented to NSF/PSERC Grid Edge 2021 organized by PSERC* (online via Zoom virtual event), Mar. 23-24, 2021, 6:00pm. This event is exclusive (**invitation only**) together with other US research-active faculty members (both PSERC/non-PSERC faculty members).
9. **Chee-Wooi Ten**, "Ahead of (Cybersecurity) Curve," co-organized with Prof. Junho Hong of University of Michigan-Dearborn *Presented to Husky Bites Webinar Series* organized by MTU Dean Janet Callahan, Spring 2021, Houghton, MI, Feb. 22, 2021, 6:00pm.
10. **Chee-Wooi Ten**, "Panel 1: Smart Grid Cybersecurity: Challenges and Opportunities," *Presented to Cyber-Physical Systems (CPS) Security Workshop, Kingston, RI*, Oct. 18-19, 2019
11. **Chee-Wooi Ten**, "Cyber Insurance for Power Grid," *Presented to Open Systems International, Inc. (OSII), Medina, MN*, May 9, 2019.
12. **Chee-Wooi Ten**, "Combinatorial Switching Attacks in IP-Based Substations," *Presented to Prof. Chen-Ching Liu's group, Virginia Tech, Blacksburg, VA*, May 2, 2019.
13. **Chee-Wooi Ten**, "Power Grid Interdependency, Vulnerability, and Security," *Presented to Institute of Public Utilities (IPU) Grid School, Michigan State University*, East Lansing, MI, USA, Apr. 29—May 1, 2019.
14. **Chee-Wooi Ten**, "Cyber Insurance for Power Grid," *Presented to Department of Electrical and Computer Engineering, Iowa State University, Ames, IA*, Apr. 9, 2019.
15. **Chee-Wooi Ten**, "Cyber Insurance for Power Grid," *Presented to Department of Electrical and Computer Engineering, University of Akron, Akron, OH*, Mar. 8, 2019.
16. **Chee-Wooi Ten**, "Cyber Insurance for Power Grid," *Presented to Prof. Osama Mohammed of Electrical and Computer Engineering, Florida International University, Miami, FL*, Feb. 18, 2019.
17. **Chee-Wooi Ten**, "Cyber Insurance for Power Grid," *Presented to Carnegie Mellon Electricity Industry Center (CEIC), Carnegie Mellon University, Pittsburgh, PA*, Feb. 6, 2019.

18. **Chee-Wooi Ten**, "Cyber Insurance for Power Grid," *Presented to Stevens Institute of Technology, Hoboken, NJ*, Jan. 23, 2019.
19. **Chee-Wooi Ten**, "Garbage in, garbage out: Geographic information system (GIS) maintenance and automation for electrical distribution system," *Presented to Allvision IO, Pittsburgh, PA*, Oct. 3, 2018.
20. **Chee-Wooi Ten**, "The imminent threats of power grid and security planning challenges," *Presented to Research and Development group at New York Power Authority (NYPA)*, White Plains, NY, Sep. 21, 2018.
21. **Chee-Wooi Ten**, "Redefined Grid Security: Two Part Presentations," *Presented to Prof. Soummya Kar's group*, Carnegie Mellon University, Pittsburgh, PA, USA, Sep. 6, 2018.
22. **Chee-Wooi Ten**, "Grid Security: From Integrated Modeling to Potential Business Opportunities," *Presented to Smart Information Flow Technologies (SIFT)*, Minneapolis, MN, USA, Jul. 12, 2018.
23. **Chee-Wooi Ten**, "Power Grid Interdependency, Vulnerability, and Security," *Presented to Institute of Public Utilities (IPU) Grid School, Michigan State University*, East Lansing, MI, USA, Apr. 9—12, 2018.
24. **Chee-Wooi Ten**, "Cyber Risk Assessment Based on Extreme Contingency Enumeration and Cascading Implications," *Presented to Electrical and Computer Engineering Department, University of Minnesota*, Twin-Cities, MN, USA, Feb. 28, 2018.
25. **Chee-Wooi Ten**, "Infrastructure Interdependency and Cybersecurity," *Presented to Institute of Public Utilities (IPU) Grid School, Michigan State University*, East Lansing, MI, USA, Mar. 27—30, 2017.
26. **Chee-Wooi Ten**, "Cyber-Based Contingency Analysis," *Presented to ECE Department and Electric Energy Systems Group (EESG), Carnegie Mellon University*, Pittsburgh, PA, USA, Dec. 10, 2015.
27. **Chee-Wooi Ten**, "The New Normal of Power Grid Operation," *Presented to ECE Department, Michigan Technological University*, Houghton, MI, USA, Oct. 8, 2015.
28. **Chee-Wooi Ten**, "Metric Quantification of Cyber-Related Contingency Analysis," *Presented to the group of Critical Infrastructure Protection (CIP) for feedback*, Federal Energy Regulatory Commission, Washington, DC, USA, Apr. 23, 2015.
29. **Chee-Wooi Ten**, "Cyber-Based Contingency Analysis," Hosted by Energy Systems Division, Argonne National Laboratory, Argonne, IL, USA, Apr. 13, 2015.
30. **Chee-Wooi Ten**, "Transitioning Campus Distribution Grid to Networked Microgrids," under *session P1_D1 panel: Examples of Testbeds and Platforms (Part 1)*, Hosted by the Tenth Carnegie Mellon Electricity Conference, Pittsburgh, PA, USA, Mar. 31—Apr. 1, 2015.
31. **Chee-Wooi Ten**, "Simulating Multiple Substation Failures," Hosted by SCADA Security Scientific Symposium (S4), Miami, FL, USA, Jan. 13–16, 2015.
32. **Chee-Wooi Ten**, "Networking the Micro-Level Grids Under Extreme Emergency Conditions," under *panel 3 speakers: diaster prevention and emergency response* Hosted by PowerCon 2014, Chengdu, China, Oct. 20—22, 2014.
33. **Chee-Wooi Ten**, "Distribution Validation Framework and the Emerging Technologies," NSF Collaborative Research Meeting, hosted by Prof. Lingfeng Wang of the University of Wisconsin—Milwaukee, Milwaukee, WI, USA, Oct. 10, 2014.
34. **Chee-Wooi Ten**, "Online Data Validation for Distribution Operations Against Cybertampering," Hosted by EEE Department, The University of Hong Kong, Hong Kong SAR, China, Nov. 27, 2013.
35. **Chee-Wooi Ten**, "Michigan Tech Campus Networked Microgrid," Department of Energy Microgrid Workshop, Oak Ridge National Laboratory, Oak Ridge, TN, USA, Nov. 20, 2013.
36. **Chee-Wooi Ten**, "Electrical Substation Sabotage," Hosted by SCADA Security Scientific Symposium (S4), Miami, FL, USA, Jan. 15–16, 2013.
37. **Chee-Wooi Ten,** "Next-generation Distribution Control Centers (NDC2)" Hosted by Prof. Seongil Lim, Kyungnam University, Korea. This is a one-week trip (Nov. 19–23, 2012) to South Korea. Visits include:
    i) Korea Electric Power Research Institute (KEPRI),
    ii) Next-Generation Power Technology Center (NPTC) of Myongji University (Director: Prof. Seung-Jae Lee), and
    iii) Korea Electrotechnology Research Institute (KERI) organized by Dr. Seung-Jeong Rim.
38. **Chee-Wooi Ten**, "Graduate Studies at Tech in Power and Energy Areas," Hosted by Michigan Tech Power Seminar, Houghton, MI, USA, Sep. 6, 2012.
39. **Chee-Wooi Ten**, "Cybersecurity Accountability Framework for Power Grids," *Presented to Electrical and Computer Engineering Department, George Washington University*, DC, USA, Mar. 19, 2012.
40. **Chee-Wooi Ten**, "Integrated Cyber-Physical Control Center Framework for Power Grids," *Presented to Electrical, Computer, Energy Engineering Department, Arizona State University*, AZ, USA, Mar. 9, 2012.
41. **Chee-Wooi Ten**, "Anomaly Detection for Cybersecurity of the Substations," Hosted by Michigan Tech Power Seminar, Houghton, MI, USA, Sep. 1, 2011.

42. **Chee-Wooi Ten**, "Strengthening Operational Resiliency of Interconnected Power Systems by Incorporating Cybersecurity," Hosted by Department of Electrical Engineering, Tsinghua University, Beijing, China, Nov. 25, 2010.
43. **Chee-Wooi Ten**, "Power Grid Attacks and Security," Hosted by IBM Corp., Design Automation Conference (DAC) 2010 Workshop on Synergies Between Design Automation and Smart Grid. Co-presenting with Drs. Ingrid Verbauwhede (Katholieke Universiteit Leuven) and Patrick Schaumont (Virginia Tech), Anaheim, CA, USA, Jun. 13, 2010.
44. **Chee-Wooi Ten**, "Vulnerability Assessment of Cybersecurity for Power Infrastructure," Hosted by The University of Hong Kong - Initiative on Clean Energy and Environment (HKUICEE), Hong Kong SAR, China, Dec. 3, 2009.
45. **Chee-Wooi Ten**, "Roadmap to Secure Power Control Systems against Cyber-Intrusions," Hosted by IEEE SMC and PES Singapore, National University of Singapore, Singapore, Nov. 23, 2009.
46. **Chee-Wooi Ten**, "Vulnerability Assessment of Power Transmission Cybersecurity," *Presented to Electrical and Computer Engineering Department, Clarkson University*, Postdam, NY, USA, April. 16, 2009.

5.0 SUPPORT AND HOSTING

5.1 In-Kind Donations, Funding, and Hosting for Smart Grid Initiative:
1. **Chee-Wooi Ten (Co-PI)**, Vinh Nguyen (PI), Aleksandr Sergeyev (co-PI), Yu Cai (co-PI), and Nicholas Hendrickson (co-PI), "Demonstration of Secure Digitalization and Cybersecurity Playbook for Energy-Efficient Smart Manufacturing," CyManII, Mar. 1, 2024 – Sep. 30, 2025. Total Amount: $704,409.
2. **Chee-Wooi Ten (co-PI)**, with Iowa State University as lead institution, UIUC, UMN, utility companies, vendors, and national labs, "CyDERMS: Center for Cybersecurity & Resiliency of DERs and Microgrids-integrated Distribution Systems," Department of Energy (DOE) Cybersecurity, Energy Security, and Emergency Response (CESER) University-Based Cybersecurity Centers (DE-FOA-0002503)., Feb. 1, 2024 – Jan. 31, 2026. Total Amount: $2,000,000 (MTU portion is $105,000).
3. **Chee-Wooi Ten (Co-PI)**, Flavio Costa (PI), and Wayne Weaver (Co-PI), "Grid Emulation in Campus Buildings Incorporating Distributed Renewables and Vehicle/Battery Charging," Michigan Tech Research Excellent Fund (REF) – Research Seed (RS) Grants, Jul. 1, 2023 – Jun. 30, 2024. Total Amount: $33,530 (**ICC cost share: $3,000**).
4. **Chee-Wooi Ten (co-PI)**, Kuilin Zhang (PI), Tim Colling (co-PI), "A Decarbonized and Resilient Intermodal Freight Transportation (DRIFT) Modeling Platform for Intermodal Logistical Decisions under Uncertainty," US Department of Energy, ARPA-E, 10/27/2023 – 4/30/2025, total amount for Michigan Tech is $1,050,000
5. **Chee-Wooi Ten (co-PI)**, Vinh Nguyen (PI), Yu Cai (co-PI), Nicholas V. Hendrickson (co-PI), "An OT Cybersecurity Web Portal for Small-to- Medium Manufacturers," Manufacturing x Digital (MxD), the Digital Manufacturing Institute, 9/21/2023 – 6/21/2024, total amount for Michigan Tech is $337,540 (total value of project is $675,074 including 50% cost share).
6. **Chee-Wooi Ten (PI)**, "I-Corps: Development of a Power Substation Blackbox," National Science Foundation, 9/1/2022 – 8/31/2023, total amount for Michigan Tech is $50,000.
7. **Chee-Wooi Ten (PI)**, "Minimum Viable Product (MVP) for blackbox solutions," Great Lakes Region I-Corps Hub Workshop for MVP award, 6/3/2022 – 8/15/2023, total amount for the PI is $5,000.
8. **Chee-Wooi Ten (co-PI)**, "PSERC Summer Transformation School," Alfred F. Sloan Foundation through Arizona State University, 12/1/2021 – 12/31/2022, $34,050 of $250,000.
9. **Chee-Wooi Ten (PI)**, "Local I-Corps workshop #3," Great Lakes Region I-Corps Hub Workshop for NSF I-Corps mini-grant, 9/13/2021 – 8/31/2023, total amount for the PI is $2,500.
10. **Chee-Wooi Ten (PI)**, "Proposal to join PSERC: Addressing Research Ecosystem, Its Sustainability and Industry Engagement," Power Systems Engineering Research Center (PSERC). Michigan Tech has been granted with an approval by PSERC executive committee on April 29, 2021. Tech is now one new member of the 13 PSERC institutions, which is eligible to participate in bidding seed grants for Ph.D. students.
11. **Chee-Wooi Ten (Co-PI)**, Yu Cai (PI), Jean Mayo (co-PI), Todd Arney (co-PI), and Bo Chen (co-PI), "CyberCorps: Scholarship for Service Program at Michigan Tech," National Science Foundation, 4/1/2021 – 3/31/2026, total amount for Michigan Tech is $3,378,192.
12. **Chee-Wooi Ten (PI)**, "Best Practices in Risk Management for Utility Cybersecurity," Consulting on behalf of Michigan Tech to identify the best practices in cybersecurity for utility practitioners. Protect Our Power, 3/1/2020 – 8/31/2021, $25,000 of $25,000.
13. **Chee-Wooi Ten (Co-PI)** with University of California—Riverside, "Discovery of Signatures, Anomalies, and Precursors in Synchrophasor Data with Matrix Profile and Deep Recurrent Neural Networks," Department of Energy (DoE) DE-FOA-0001861, 9/1/2019 – 3/31/2021, $100,000 (MTU) of $999,415.

14. Roman Sidortsove (PI) and Chelsea Schelly (Co-PI), Qingli Dai (Senior Personnel), Timothy J. Scarlett (Senior Personnel), **Chee-Wooi Ten (Senior Personnel)**, David W. Watkins (Senior Personnel), "Enhancing Electrical Grid and Community Resilience through Repurposing Decommissioned Mines into Underground Pumped Storage Facilities," Alfred P. Sloan Foundation, 1/1/2019—12/31/2019, Total Amount: $76,443 (including cost share), requested amount from the foundation $49,963.

15. **Chee-Wooi Ten (Lead PI)** and Yeonwoo Rho (co-PI), "CPS: Medium: Collaborative Research: An Actuarial Framework of Cyber Risk Management for Power Grid," National Science Foundation, Sep. 1, 2017 – Aug. 31, 2020. Total Amount: $348,866 of $700,975 with University of Wisconsin—Milwaukee.

16. **Chee-Wooi Ten (Co-PI)**, Laura Brown (PI), and Wayne Weaver (co-PI), "Collaborative Research: CRISP Type 2: Revolution through Evolution: A Controls Approach to Improve How Society Interacts with Electricity," National Science Foundation, Oct. 1, 2015 – September 30, 2018. Total Amount: $699,796 of $2.5M with other 3 universities and 1 company (**My portion: $235,368**).

17. **Chee-Wooi Ten (Co-PI)**, Wayne Weaver (PI), and Gordon Parker (co-PI), "Modeling and Control Technologies for Near-Term and Long-Term Networked Microgrids," Department of Energy subcontracted through Argonne National Laboratory, Sep. 1, 2013 – August 31, 2014. Total Amount: $255,465 (**My portion: $61,537**).

18. **Chee-Wooi Ten (Co-PI)**, Sumit Paudyal (PI), and Bruce Mork (co-PI), "Strategies for Real-Time Monitoring and Optimal Control of Michigan Tech Distribution System," Michigan Tech Research Excellent Fund (REF) – Research Seed (RS) Grants, Jul. 1, 2013 – Jun. 30, 2014. Total Amount: $25,000 (**My portion: $8,333.33**).

19. **Chee-Wooi Ten (PI),** "Implementation of Unidirectional Gateway in a Substation Networked Environment (Design Phase)," Waterfall Security Solutions. Total Amount: $24,000 (cash) + $212,000 (software) (**My portion: $236,000**).

20. **Chee-Wooi Ten (PI)**, "Collaborative Research: Integrated Vulnerability-Reliability Modeling and Analysis of Cyber-Physical Power Systems," National Science Foundation, ECCS Energy, Power and Adaptive Systems (EPAS), Jun. 1, 2012 – May 31, 2015. Total Amount: $200,000 (**My portion: $200,000**).

21. **Chee-Wooi Ten (PI)**, "Campus-Wide Smart Grid Initiative (Phase 1): Strengthening Campus Energy Information Communication Infrastructure (Michigan Tech Start-Up)," This is a joint effort of Michigan Tech Facilities Management and Power and Energy Research Center (PERC) project that involves in multi-phase cyberinfrastructure deployment. This project stresses on practical implementation and interoperability of other software vendors. There are 10 buildings with electronic meters at Chem Science, DHH, Dow, EERC, Forestry, Library, McNair, MME, SDC, and Wad; and 2 buildings with FDR units at SDC Ice Arena and Rosza, Jul. 1, 2011 – Jun. 30, 2012. Total Amount: $35,000 (**My portion: $35,000**).

22. **Chee-Wooi Ten** (Supporting the project for enhancing EE5250 class – Distribution Engineering), "US DOE An Interdisciplinary Program for Education and Outreach in Transportation Electrification," Nov. 1, 2009 – Oct. 31, 2012. Total Amount: $26,827 (**My portion: $26,827**).

23. **Chee-Wooi Ten (PI)**, "Senior Design: Reducing Maintenance Cost of Substation Automation through Continuous Monitoring," ITC Holdings Corp., Aug. 30, 2010 – Apr. 22, 2011. Total Value: $15,000 (**My portion: $15,000**).

24. **Chee-Wooi Ten (PI)**, "Software IEC61850 Substation Automation Networking, AXS4-MMS-132-095-EDU, provides real-time object-oriented communication for substation automation in distribution, transmission, and generation applications," gifted by SISCO Inc., Jun. 16, 2010. Total Gift Value: $3,750 (**My portion: $3,750**).

25. **Chee-Wooi Ten (PI)**, "Frequency Disturbance Recorder (FDR) Host for the Area of Michigan's Upper State," provided by Prof. Yilu Liu of University of Tennessee-Knoxville, Feb. 23, 2010.

5.2 Referee Service, Recognitions, and Honors:

1. 2023/2024 Faculty Fellowship at the Center for Innovation in Sustainability & Resilience (CISR)
2. Presenter for Panel moderated by Dr. Luo Xu of Princeton University, "Towards a Resilient Power System Under Climate Extremes: Risk Analysis and Resilience Enhancement," IEEE ISGT Latin America, Puerto Rico, Nov. 6—8, 2023.
3. Two Paper Session Chairs on "Power System Operation and Planning," North American Power Symposium (NAPS), Asheville, North Carolina, October 15—17, 2023.
4. Guest editor, IEEE Transactions on Cloud Computing, Special Issues on Cloud-Edge-End Orchestrated Computing for Smart Grid, 2023
5. **Received Accolade from Provost Office & Senior Vice President for Academic Affairs with exceptional "Average of 7 Dimensions" in the top 10% instructor evaluation for Spring 2021**
6. Steering committee for a workshop, *Moving from Unresolved Problems to Research Questions and Directions*, March 23-24, 2021 (online) which is co-sponsored by NSF and PSERC forum. This effort has a

group of 12 faculty members (6 from PSERC institution and the other 6 from non-PSERC universities). The planning of this workshop is led by Prof. Mladen Kezunovic.

7. Received Accolade from the Office of Provost & Senior Vice President for Academic Affairs for the recognition of **"excellence in handling to transition from face-to-face instruction to remote learning during COVID-19 in Spring 2020 semester,"** May 19, 2020.
8. Moderator for Panel 1, "Smart Grid Security: Opportunities and Challenges," URI Cyber-Physical Systems Security, Smart Grid Security: Science and technology advancements and challenges, South Kingstown, RI, Oct. 18—19, 2019.
9. Director for the first-time two-day event of MTU ECE CPS workshop for Continuing Education. Responsible to invite 6 key speakers on the theme of Grid-Transportation, Houghton, MI, July 30—31, 2019.
10. Editor, IEEE Transactions on Smart Grid, Impact factor: 8.960 (2021), August 2016 – Present;
11. Elsevier journal Sustainable Energy Grids and Networks, Impact factor: 3.899 (2021), August 2016 – Present.
12. Guest associate editor, IET Generation, Transmission & Distribution, Special Issue: Intelligent protection and control of microgrids with energy storage integration, Feb. 28, 2018 – Jan. 31, 2019.
13. IEEE Senior Member (2011 – Present), IEEE Member (2008 – 2010), and IEEE Graduate Student Member (2007 – 2009).
14. ISA Member (2017 – Present).
15. Paper Session Chairs on "S3-5: Microgrid Control and Simulation" and "S3-10: Power System Resilience," IEEE SmartGridComm 2015, Miami Marriott Biscayne Bay Hotel, Miami, FL, November 1 – 5, 2015.
16. Paper Session Chair on "Transactions Paper Session PSACE 3," IEEE PES General Meeting, Gaylord National Resort & Convention Center, National Harbor, MD, July 27 – 31, 2014.
17. Paper and Poster Sessions Co-Chair on "PSACE Computer and Analytical Methods," IEEE PES General Meeting, Manchester Grand Hyatt Hotel, San Diego, CA, July 12 – 26, 2012.
18. Paper Session Chair on "Microgrid Monitoring and Islanding," IEEE PES Innovative Smart Grid Technologies Conferences, Washington Marriott Wardman Park (DC), January 16 – 20, 2012.
19. Graduate Scholarship of Cybersecurity for Process Control Systems Summer School, Lake Geneva, WI, June 16 – 20, 2008. This is organized by Information Trust Institute (ITI) at the University of Illinois at Urbana-Champaign.

<div align="center">Reviewer</div>

1. External reviewer for tenure applications from other universities (2023, 2021, 2018)
2. IEEE Access, August 2020 – Present.
3. Technical Program Committee (TPC) member for IEEE Smart Grid Comm 2020, Tempe, Arizona, October 6—9, 2020.
4. Panelist, National Science Foundation (NSF): 2011 (once); 2012 (once); 2013 (twice); 2014 (once); 2015 (twice); 2016 (twice); 2017 (three times); 2018 (twice); 2019 (once), 2024 (once).
5. Panelist/reviewer, Department of Energy 2018 (once), 2019 (once), 2020 (once), 2023 (twice).
6. Science Foundation Ireland; March 2019.
7. New Zealand Ministry of Science and Innovation; May 2012.
8. Electric Power Components and Systems, December 2014 – Present.
9. North American Power Symposium (Pullman 2014).
10. IEEE PES General Meeting (San Diego 2012, Vancouver 2013, National Harbor 2014, Denver 2015).
11. International Journal of System of Systems Engineering (IJSSE), July 2009 – Present.
12. IEEE Transactions on Industrial Informatics, September 2015 – Present.
13. IEEE Transactions on Power Systems, January 2010 – Present.
14. IEEE Transactions on Smart Grid, July 2010 – Present.
15. Electric Power Systems Research, January 2010 – Present.
16. Information Systems and e-Business Management, June 2010 – Present.
17. European Transactions on Electrical Power, July 2010 – Present.
18. IEEE PES PowerTech Trondheim 2011.
19. IEEE Transactions on Power Delivery, June 2011 – Present.
20. Applied Energy, August 2011 – Present.
21. Computer Networks, July 2013 – Present.
22. IET Generation, Transmission & Distribution, February 2014 – Present.
23. Computer and Electrical Engineering – An International Journal, October 2014 – Present.
24. International Journal of Electrical Power and Energy Systems, October 2014 – Present.
25. Ph.D. Thesis, Indian Institute of Technology (IIT) Bhubaneswar, India; Sep. 2015; Mar. 2018.
26. Ph.D. Thesis, Universiti Malaya, Malaysia; Dec. 2023.

5.3 University/Departmental Service:
1. Ad-Hoc Task Force Lead for Sustainable Building Capital Project Proposal August 31–December 31, 2023
2. ICC CPS Center Director. July 1, 2021–Present
3. PSERC Site Director for Michigan Tech. June 8, 2021–Present
4. Senator, MTU ECE Department. September, 2020 (continued Christopher Middlebrook's term; Alternate was Jeff Burl); Re-elected on August 30, 2021 (Alternate is Paul Bergstrom) – August 31, 2023. Continued as Alternate until August 31, 2024.
5. Member of subcommittees, (1) Research and (2) Campus and Community Engagement of MTU Initiative on Sustainability and Resilience Working Group, March 2020–Present
6. College P&T Committee, 2022/2023, 2023/2024
7. External member, MTU MMET Department Promotion and Tenure (P&T) Committee, 2021/2022, 2023/2024.
8. Member, MTU ECE Department Promotion and Tenure (P&T) Committee, 2019/2020.
9. Founding member, MS Cybersecurity Committee for Critical Infrastructure Protection, April 2015 – Present
10. Member, MTU ECE Graduate Program Committee, September 2010 – Present
11. Member, MTU ECE Diversity and Outreach Committee, September 2010 – Present
12. HLC Graduate Assessment Coordinator for MTU ECE Department, September 2017 – September 2018

5.4 Technical Subcommittee:
1. Member, US Department of Homeland Security, Industrial Control Systems Joint Working Group (ICSJWG) and the Workforce Development subgroup, May 2012 – Present
2. Member, IEEE PES Distribution System Analysis Subcommittee (DSASC) WG, 2011 – Present
3. Member, IEEE PES Computer and Analytical Methods (Cybersecurity Task Force), 2010 – 2016
4. Member, IEEE PES Computer and Analytical Methods (CIM Task Force), 2010 – 2016
5. Member, IEEE PES Student Meetings, 2010 – Present

5.5 Training:
1. NERC CIP 002–009 training Fall 2006 on June 1, 2006, Minneapolis, MN (**Completed**)
2. EDU: Stop Harassment and Discrimination (Lenses US-13F) 1.0 hour on April 5, 2015, Houghton, MI (**Completed**)
3. Foundations of Online Teaching (ED5101) course, Fall 2019 second section, December 20, 2019, Houghton, MI (**Completed**)
4. Diversity Literacy Full Course, Fall 2020, October 5–23, 2020, Houghton, MI (**Completed**)
5. Legal Aspects of Hiring—online course, Fall 2020, October 26–30, 2020, Houghton, MI (**Completed**)
6. Participant for October 1 event sponsored by ADVANCE Partnership - Joining Forces (**Progress**)

6.0 RESEARCH SUPERVISION

6.1 Ph.D. Degrees:

Name	Research Topics and Status	Period of Candidacy
Mr. Anurag Nagpure	"DER Anomaly Detection Against Malicious Attacks"	Spring 2024 – Now
Mr. Lawrence Dilworth	"Distribution System Resilience" * Participated I-Corps as co-entrepreneur lead in Fall 2022 semester with Zac Canders * Starting in Fall 2023, the recipient will be a CyberCorps awardee for the duration of his 3-year PhD program. *** Passed Ph.D. Oral and Written Qualifying Examinations (Summer 2023)** (**The student received an Outstanding Teaching Award from the MTU Graduate School for the year 2024.**)	Fall 2022 – Now
Dr. Diego Aponte Roa (Co-supervised with Prof. Wayne W. Weaver)	"Power Grid Resilience." *** Passed Ph.D. Oral and Written Qualifying Examinations (Spring 2018)** *** Passed Proposal Examination** Employed at Ana G. Méndez University (UAGM)	Spring 2018 – Spring 2022
Dr. Zhiyuan Yang	"*Metric Derivation on Steady-State Enhancement based on Cyber-Related Events*"	Fall 2015 – Fall 2018

Name	Research Topic	Period of Candidacy	Whereabout
	* Passed Ph.D. Oral and Written Qualifying Examinations (Fall 2015) (The student won Michigan Tech ECE Outstanding Teaching Award for the year of 2017) * Passed Proposal Examination * Final Oral Examination: October 14, 2018 Employed at Guangdong Electric Power Design Institute		
Dr. Yachen Tang	"*Enhanced Load Modeling Incorporating Occupancy Patterns.*" * Passed Ph.D. Oral and Written Qualifying Examinations (Spring 2016/Fall 2015) * Passed Proposal Examination * Final Oral Examination: October 16, 2018 Employed at Envision Digital	Spring 2015 – Fall 2018	
Dr. Koji Yamashita	"*System Dynamics and Stability Evaluation.*" * Passed Ph.D. Oral and Written Qualifying Examinations (Spring 2016/Fall 2015) * Passed Proposal Examination 1. Received Accolade from the Office of Provost & Senior Vice President for Academic Affairs with exceptional "Average of 7 Dimensions" in the top 10% instructor evaluation for Fall 2018 semester 2. Received Matt Wolfe Award in 2020 for outstanding graduate research assistant. Details of the Matt Wolfe's list is at https://www.mtu.edu/ece/department/student-awards/wolfe-award.html * Final Oral Examination: November 30, 2020 Employed at University of California—Riverside	Spring 2013 – (full time) in Summer 2018 – Fall 2020	
Dr. Yonghe Guo	"*Cybersecurity for Distribution Grid.*" * Passed Ph.D. Oral and Written Qualifying Examinations (Fall 2010) * Passed Proposal Examination * Final Oral Examination: December 11, 2014 Employed at State Grid Information & Telecommunication	Fall 2010 – Fall 2014	

6.2 Master's Degrees (Plan A – thesis):

Name	Research Topic	Period of Candidacy	Whereabout
Mr. Matthew J. Gervasi	To be determined	Fall 2024 – Now	Air Force Civilian Service at the Air Force Nuclear Weapons Center
Mr. Anurag Nagpure	"Reverse engineering of short circuit analyses."	Fall 2019 – Spring 2021	Open Systems International, Inc. and later continued Ph.D.
Mr. Yachen Tang	"*Load Modeling for Distribution System.*"	Fall 2013 – Fall 2014	Continued Ph.D.
Mr. Rashiduzzaman Bulbul	"Cyber-Contingency Analysis for Power Grids"	Fall 2012 – Spring 2014	Systems Control (now Hubbell)
Mr. Pingal Sapkota	"*Security Evaluation of Substation Network Architectures.*"	Summer 2012 – Summer 2013	Material Handling Industry
Mr. Nathan S. Fettinger (Co-supervised with Prof. Chunxiao Chigan)	"*Interaction Between Vehicular Network of Plug-in Hybrid Electric Vehicle and Energy Distribution Infrastructure.*"	Fall 2010 – Summer 2012	Boston Scientific

	(**The student won Michigan Tech ECE Graduate Teacher Award for the year of 2011**)		
Ms. Bhairavi Pandya	"*Incorporation of Distributed Resources in Primary Distribution System for Emergency Control.*"	Fall 2010 – Summer 2012	Schweitzer Engineering Laboratories

6.3 Research Experience for Undergraduates:

Visiting Period	Name and Affiliation
Fall 2023 – Present	Mr. Matthew Bailey (CyberCorps undergraduate)
Summer 2022	Mr. Teagan Hill (Tutorial development on collaborative robots)
Summer 2019	Mr. Charlie Ciuk (Investigation on NERC CIP policies)
Fall 2013 – Fall 2014	Mr. Tyler Sommer (Unidirectional Gateways for Substation Network)
Summer 2013	Mr. Brent Nix (Virtualization for Substation Network)
Summer 2012 – Fall 2012	Ms. Giovana Fenocchio Azzi (Distribution Load Flow)
Fall 2010 – Spring 2012	Ms. Hillori Mitchell (PHEV load study)

6.4 Visiting Scholars:

Visiting Period	Name and Affiliation
Jun. 2017 – Dec. 2017	Ms. Jiao Du, Ph.D. Candidate, The University of Hong Kong, SAR, China.
May 2014 – Aug. 2014	Mr. Chong Wang, Ph.D. Candidate, The University of Hong Kong, SAR, China.
Jan. 2012 – Jan. 2013	Dr. Hua Xie, Associate Professor, Beijing Jiaotong University, Beijing, China.
Mar. 2012 – Sep. 2012	Ms. Yuan Gong, Ph.D. Candidate, Tsinghua University, Beijing, China.

7.0 COURSES

1. **EE2111-0A (Fall 2012) – Electric Circuits I**: This course covers basic electrical concepts, resistive circuits, nodal and loop analysis techniques, superposition, Thevenin and Norton equivalents, maximum power transfer, capacitance and inductance, AC steady-state analysis, steady-state power analysis.
2. **EE2112-0A (Fall 2015, Fall 2021) – Electric Circuits II and Lab**: This is the 2nd course of circuit analysis that includes stead-state power and polyphase circuit analysis, magnetically coupled networks, variable frequency, Laplace transform and its application, two-port networks.
3. **EE4222 (Spring 2018) – Power System Analysis II**: A senior elective class that covers power flow methods, unbalanced/balanced short circuit analysis, protective relaying on mesh and radial networks as well as basic stability concepts on equal area criterion. This course covers a bread scope of studies in preparing senior undergraduates for their career in power engineering.
4. **EE4723 (Spring 2013) – Computer and Network Security**: A senior elective class that covers fundamental principles of cryptography, its applications to network and communication on firewall, VPN and in-depth exploration of the cyberinfrastructure deployment. Countermeasures and considerations to address the security breath with possible emerging security issues such as cloud computing and cybersecurity for power infrastructure communication are discussed.
5. **EE4800 (EE4229)/SAT4996 (Spring 2021) – Substation Cybersecurity Planning**: This course will explore fundamental formal methods in establishing data analytics for substation cybersecurity planning. The early phase of this course includes identifying the deployed or to-be-deployed digital devices. The fundamental science is a risk-based framework based on a utility organization and how they establish an inventory of their cyber assets, including the process of procurement in software and hardware. The verification of the "sandbox" comprises the manufacturing phase and how to transition to the factory acceptance test (FAT) and site acceptance test (SAT) before the availability test (AT) and warranty begin. This class will also explore commercially available software and other security software system within a network with the dependencies of other potentially involved software systems.
6. **EE4901-L04, EE4910-R04 (Fall 2010; Spring 2011) – Senior Design Project**: International Transmission Company (ITC)-sponsored senior design project for ECE department on their existing protection system, monitoring and maintaining the ITC-SCADA systems with new lockout relays. Operating costs and frequency of maintenance will be identified.
7. **EE5900-05 (Spring 2017) – 1 Guest Lecture for "Advanced Computational Methods for Computer Engineering"**: *Dr. Ten's contributions to 75-minute lecture on "power flow for electrical distribution and transmission systems" March 23, 2017.* This course is related to computational methods for computer engineering major that emphasizes on graph theory and computational efficiencies in multiple domains of interest.

8. **EE5240-0A (Spring 2015) – 2 Guest Lectures for "Computer Modeling of Power Systems"**: *Dr. Ten's contributions to computer modeling of "contingency analysis" lectures April 6, 2015 and April 8, 2015*. Topics include modeling and computer methods applied to electrical power systems, matrix formulations, network topology and sparse matrix data structures, loadflow, short-circuit and stability formulations, constrained optimization methods for loadflow and state estimation, and time-domain simulation methods for transient analysis.

9. **CS5472-0A (Spring 2021) – 1 Guest Lecture for "Advanced Computer Security"**: *Dr. Ten's "Combinatorial Switching Attacks in IP-Based Substations" lecture February 11, 2021*. This course covers various aspects of producing trusted computer information systems. Topics include network perimeter protection, host-level protection, authentication technologies, formal analysis techniques, and intrusion detection. Current systems will be examined and critiqued.

10. **EE5920 (Fall 2011, 2012) – Graduate Seminar in Power and Energy Systems**: Coordinated the seminar arrangement of graduate student presentations and invite external guest speakers (listed below) in cross-disciplinary topics related to power systems engineering. Seminar URLs:
    a. http://www.ece.mtu.edu/~ten/EE5920fall2011.htm.
    b. http://www.ece.mtu.edu/~ten/EE5920fall2012.htm.

11. **EE5900-06 (Fall 2010) – Distribution System Under Emergency Operating Conditions**: Students study one or more special topics in energy distribution systems under emergency operating conditions. Integrations of potential emerging information communication technologies and distributed energy resources are discussed. Parallel, distributed, and trusted computing for the distribution dispatching control center framework is also determined.

12. **EE5805-32 (Summer 2010; Spring 2011) - Directed Study**: Students study one or more special topics in Electrical Engineering under the direction of emerging technologies in energy distribution systems.

13. **EE5230(0A/0B) – (Fall 2020, 2023)**: This course addresses advanced topics, such as state estimation, automatic generation control, load forecasting, contingency analysis, and control area interchange for the operation and control of the electric power system, focusing on generation and transmission networks.

14. **EE5231, started as EE5900-01 (Fall 2011, 2013), (Spring 2021, 2023) – Energy Control Center Applications**: Students explore concepts of monitoring and control technologies for energy control centers that govern transmission systems. New approaches include the steady-state analysis of advanced state estimation, alarm processing, fault diagnosis, telecommunication assessment, defense strategies, system-wide restoration and visualization.

15. **EE5232(0A/0B) – (Spring 2020): Introduction to power system economics**: This course emphasizes on organization and applications of the electricity market (optimization methods), basic principle of contracts and electricity commodity, effects on the transmission market System operation, generation expansion, as well as transmission investment.

16. **EE5250(0A/OB)** – It was EE4225/EE5250 and was changed to EE5250 in Spring 2014 **(Spring 2010, 2011, 2012, 2014, 2015, 2016, 2017, 2018, 2020; Summer 2021, 2022, 2023) – Introduction to Energy Distribution Engineering (Distribution Engineering I)**: A senior and graduate-level class that emphasizes on modeling and analysis of electrical distribution systems; load characteristics, load modeling, unbalanced three-phase overhead lines and underground cables, and distribution transformers. Analysis of primary system design, introductory applications for capacitors, voltage drop, power loss, distribution system protection, and introduction to advanced distribution automation.

17. **EE5251(0A/OB)** – **(Fall 2016, 2020, 2022) – Distribution Emergency Operation (Distribution Engineering II)**: This is a follow-up graduate course of EE5250 that emphasizes on extraction of geographic information system (GIS) dataset and graph-theoretic modeling for interconnected feeders. Switching algorithms and crew coordination introduced in the outage management system (OMS) and how the inference of outage segments can be identified systematically based on trouble call tickets and smart meters with the feeder remote terminal units (FRTU) from the supervisory control and data acquisition (SCADA).

18. **EE6210-0A (Fall 2014, 2017, 2019, 2022) – Power System Dynamics and Stability**: This course is to study the dynamic behavior of power systems with a review of synchronous machine modeling, system dynamic equations, and method of analysis. The course also includes examining overall system behavior via small signal, transient stability, and energy functions. FNET and MTU drills of facilities management are incorporated part of the instruction to observe islanding from the FDR real-time measurements.

8.0 MTU THESIS COMMITTEE MEMBER (AS NON-MAJOR PROFESSOR)

Period	Name and Major
Fall 2018 – Fall 2022	Xing Ling, Ph.D., Mathematical Sciences

	Adviser: Prof. David Hemmer (previously with Prof. Yeonwoo Rho)
Spring 2021 – Spring 2021	Isha Malekar, Mechanical Engineering (Plan B) Adviser: Prof. Gordon Parker
Fall 2020 – Fall 2020	Zhiqiang Zhao, Ph.D., Electrical Engineering Adviser: Prof. Zhuo Feng
Fall 2020 – Fall 2020	Yongyu Wang, Ph.D., Electrical Engineering Adviser: Prof. Zhuo Feng
Spring 2020 – Fall 2020	Khalid Khan, Ph.D., Electrical Engineering Adviser: Prof. Lucia Gauchia
Summer 2020 – Fall 2021	Xiang Zhou, Ph.D., Mechanical Engineering Adviser: Prof. Wayne W. Weaver
Fall 2019 — Summer 2020	Alexander W. Miranda, Ph.D., Mechanical Engineering Adviser: Prof. Steven Goldsmith
Fall 2017 — Spring 2019	Dr. Jun (Anna) Liu, Ph.D., Statistics Adviser: Prof. Yeonwoo Rho
Spring 2016 — Spring 2017	Dr. Yuenyong Nilsiam, Ph.D., Electrical Engineering Adviser: Prof. Joshua M. Pearce
Fall 2014 — Fall 2014	Mr. He Jiang, MS, Electrical Engineering (Plan B) Adviser: Prof. Lucia Gauchia-Babe
Spring 2014 — Fall 2014	Dr. Guna R. Bharati, Ph.D., Electrical Engineering Adviser: Prof. Sumit Paudyal
Spring 2011 — Spring 2016	Dr. Xueqian Zhao, Ph.D., Computer Engineering Adviser: Prof. Zhuo Feng
Fall 2013 — Spring 2014	Mr. Abdullahi Salman, MS, Civil Engineering (Plan A) Adviser: Prof. Yue Li
Fall 2013 — Spring 2014	Mr. Andrew J. DeRouin, MS, Electrical Engineering (Plan A) Adviser: Prof. Keat Ghee Ong
Spring 2011 — Spring 2013	Dr. Chen Liao, Ph.D., Computer Engineering Adviser: Prof. Shiyan Hu
Spring 2011 — Fall 2012	Dr. Xiaodao Chen, Ph.D., Computer Engineering Adviser: Prof. Shiyan Hu
Fall 2010 — Fall 2011	Dr. Muhammad Ali, Ph.D., Electrical Engineering Adviser: Prof. Bruce Mork
Spring 2012 — Spring 2012	Mr. Kevin Demeny, MS, Electrical Engineering (Plan B) Adviser: Prof. Bruce Mork
Fall 2011 — Fall 2011	Mr. Oskar Reynisson, MS, Electrical Engineering (Plan A) Adviser: Prof. Bruce Mork
Spring 2011 — Spring 2011	Mr. Hao Wang, MS, Computer Engineering (Plan B) Adviser: Prof. Jindong Tan

Chee-Wooi Ten, Ph.D.