Nathan Weise

Room 242 – Engineering Hall – 1637 W Wisconsin Ave, Milwaukee, WI 53233

(414) 288-6193 • nathan.weise@marquette.edu
https://www.muenergylabs.com • weisenathan

Employment

Associate Professor — **Milwaukee, WI**
Marquette University — *August 2021 to Present*
Department of Electrical and Computer Engineering

Assistant Professor — **Milwaukee, WI**
Marquette University — *August 2014 to July 2021*
Department of Electrical and Computer Engineering

Assistant Professor — **Orono, ME**
University of Maine — *Sept. 2011 to June 2014*
Department of Electrical and Computer Engineering

Graduate Research Intern — **Niskayuna, New York**
GE Global Research — *Jun. 2010 to Sept. 2010*
Characterized Hybrid SiC IGBTs, Characterized Highly Interdigitated Silicon Carbide Thyristors, and worked on state of the art MRI Gradient Drivers

Electrical Engineer — **Fridley, MN**
Cummins Power Generation — *2006 to 2007*
Controls and Electrical Engineering Systems Design

Education

University of Minnesota — **Minneapolis, MN**
Ph.D. in Electrical Engineering — *Jan. 2008 to Aug. 2011*
Dissertation: Universal Utility Interface for Plug-in Hybrid Electric Vehicles with Vehicle-to-Grid Functionality
Advisor: Ned Mohan

University of Minnesota — **Minneapolis, MN**
M.Sc. in Electrical Engineering — *Sept. 2005 to Dec. 2007*
Thesis Project: 2.4GHz Low Noise Amplifier and Wilkinson Power Divider
Advisor: Rhonda Franklin

University of Minnesota — **Minneapolis, MN**
B.Sc. in Computer Engineering — *Sept. 2001 to May 2005*

Teaching

EECE 2010 Circuits 1 — **Marquette University**
Instructor — *F'20, F'19, F'18, F'17, F'16, F'15*
3 credits, three 50 minute lectures per week

EECE 2010 Circuits 2 — **Marquette University**
Instructor — *S'20, S'19, S'18, S'17, S'16*
3 credits, three 50 minute lectures per week

EECE 6932 Digital Control of Power Electronics — **Marquette University**
Instructor — *F'19*

3 credits, three 50 minute lectures per week
– New Course. Fully designed course material and assessments.
– Designed complete noteset, complete homework set, recorded accompanying video lectures
– Course is disseminated through CUSP, https://cusp.umn.edu/

ELEN 4220/EECE 5220 Power Electronics for Renewable Energy Systems **Marquette University**
Instructor *S'19, S'18, S'17, S'16, S'15*
3 credits, two 1 hour 15 minute lectures per week and one 1 hour lab per week

EECE 6932 Advanced Power Electronics **Marquette University**
Instructor *F'18, F'15*
3 credits, two 75 minute lectures per week

ELEN 4290/EECE 5290 Control of Energy Systems **Marquette University**
Instructor *F'17*
3 credits, two 1 hour 15 minute lectures per week, new class, produced all new material, 7 students

ELEN 4230/EECE 5230 Renewable and Legacy Electric Energy Systems Analysis **Marquette University**
Insutrctor *F'16, F'14*
3 credits, two 75 minute lectures per week

ECE 450 Power Electronics **University of Maine**
Instructor *S'12, S'13*
3 credits, three 1 hour lectures per week
– New Course. Fully designed the course: lecture notes, simulations, homeworks, midterms tests, and final exam.

ECE 451 Power Electronics Lab **University of Maine**
Instructor *S'12, S'13*
1 credit, one 2 hour lab session ever other week
– New Course. Designed lab experiments and lab reports.

ECE 455 Electric Drives **University of Maine**
Instructor *F'12, F'13*
3 credits, three 1 hour lectures per week
– New Course. Fully designed the course: lecture notes, simulations, homeworks, midterms tests, and final exam.

ECE 451 Electric Drives Lab **University of Maine**
Instructor *F'12, F'13*
1 credit, one 2 hour lab session ever other week
– New Course. Designed lab experiments and lab reports.

INT 489 Renewable Energy Engineering **University of Maine**
Instructor *S'13*
3 credits, two 1.5 hour lectures per week
– New Course. Fully designed course material and assessments.
– Arranged multiple faculty to present their expertise in the field of renewable energy.

EE4701 Electric Drives **University of Minnesota**
Teaching Assistant *F'09*
4 credits, three 1 hour lectures per week and one 2 hour lab every other week
– Redesigned experiments and lab manual to better suit students needs.
– Designed course homework problems, online learning modules, and exam problems.

EE3101 Circuits Lab **University of Minnesota**
Teaching Assistant *F'08*
2 credits, one 2 hour lab per week
– Organized and coordinated lab proceedings.
– Developed new learning vessels, quizzes, and supplemental material.

EE2361 Microcontrollers Lab **University of Minnesota**
Teaching Assistant *F'07*
4 credits, one 2 hour lab per week plus three 1 hour lectures per week
– Created new labs with key learning concepts and applied these concepts to current applications.

Professional Teaching Development

- Lafferty-KEEN Community of Practice Fall Teaching Seminar Series, 2015
  - Faculty Development Seminar Series to further advance the process of incorporating student- centered learning and entrepreneurial minded learning into the engineering classroom.
- KEEN Workshops Winter 2016 - Teaching Effectiveness for Entrepreneurial Minded Learning
- Lafferty-KEEN Community of Practice Spring Teaching Seminar Series 2016
  - Strengthen relationships among faculty aimed to share knowledge and promote learning.
  - Encourage co-creation and curation of instructional resources of value to faculty.
  - Disseminate best teaching practices within and beyond the Community of Practice.
- KEEN Workshops Summer 2016 - Design Thinking
- Lafferty-KEEN Community of Practice Fall Teaching Seminar Series, 2016
- KEEN EML Virtual Conference, Workshop Winter 2017
- Lafferty-KEEN Community of Practice Spring Teaching Seminar Series 2017
- Reinventing Electric Power Curriculum with Sustainability Focus, NSF, Conference Attendance, Minneapolis, Minnesota, USA. (June 15, 2017 - June 17, 2017)
  - Discuss the Electric Power/Energy Systems Curriculum with emphasis on Sustainability
  - Describe and disseminate undergraduate/graduate curriculum developed through ONR funding
  - Grand challenge on inspiring and training students to solve global problems in sustainability
  - Discuss challenges facing ECE departments in identifying national needs and attracting students
  - Create a large and vibrant community of teaching/learning scholars
- Reinventing Power Programs through Sustainability-Focused Curriculum Workshop, NSF/ONR/ University of Minnesota, Workshop, Washington DC, Wisconsin, USA. (April 5, 2018 - April 6, 2018).
- NSF CUSP Digital Control of Power Electronics CUSP Reforming Power Curriculum (Online Virtual Conference July 22-24, 2019)
- NSF Teaching Electric Energy Courses to Rejuvenate Electric Power Curriculum (Virtual Conference, August 7, 2020)

Advisees

Post Doc

[1] Mostafa Abarzadeh, October 2019 - July 2020, Marquette University

Doctoral

[3] Armin Ebrahimian, Anticipated Graduation June 2025, Marquette University

[2] Md-Rakib Rahman, Anticipated Graduation June 2023, Marquette University

[1] Waqar Khan, Anticipated Graduation June 2023, Marquette University

Masters

[1] Matthew Hughes, Defended 3/15/21, Thesis Submitted 4/14/21, Graduation May 2021-Continuing to Ph.D., Marquette University

Undergraduate

- **(17)** David Fraley, Daniel Pederson, Brendan Shaunessy, Nicholas Brennan, Andrew Onufer, Anthony Defelippis, Seamus Herson, Timothy Bobeck, Justin Lizalek, Michael Panetta, Zachary Burke, Anin Maskay, Brandon Dupuis, Tony Nuzzo, David Hart, Lance Doiron, Lonnie Labonte

Senior Design Teams

[3] **Faculty Advisor:** Kyle Haberkorn, Luke Haberkorn, Justin Lizalek, Jeffery Josse, "Team E57: Power Aggregator Wall", Sponsored by Briggs & Stratton Corporation, Fall 2017 - Spring 2018

[2] **Faculty Advisor:** Jonathan Tripi, James Schroder, Zac Crites, Calvin Lei, "Team E57: Power Aggregator Wall", Sponsored by Briggs & Stratton Corporation, Fall 2016 - Spring 2017

[1] **Faculty Advisor:** Brian Axen, Calvin Jay, Lucas Rutowski, Matt Latin, Nick Post, "Team E60: Vintage Tube Amplifier", Fall 2015 - Spring 2016

Advisees (Graduated)

Doctoral

[1] Ramin Katebi, Graduated June 2019, Marquette University (Employed at Wisk, an all-electric aviation company)

Masters

[3] Arjun Andhra, Graduated May 2015, Marquette University
[2] Asa Sproul, Graduated May 2015, University of Maine
[1] Nathan Reimensynder, Graduated 2013, University of Maine

Graduate Student Committee Member

Doctoral Students

- Amamihe Onwuachumba, University of Maine
- Aseem Rambani, University of Maine
- Yunhui Wu, University of Maine

Masters Students

- Nathan Reimensynder, University of Maine
- Micheal Macinoli, University of Maine
- Chad Somogyi, Marquette University
- Ali Alqarni, Marquette University
- Hamad Aldawsari, Marquette University

Honors Undergraduate Students

- Brendan Gates, University of Maine

Awards

- **Marquette Way Klinger Young Scholar Award**, 2020-2021
- **Marquette Teacher of the Year**, 2019, *IEEE Eta Kappa Nu Beta Omicron Chapter*

Grants

Total Funding: $3,318,261 ($3,095,734 at MU), Total as PI: $1,336,261 ($1,165,734 at MU), Total External: $3,211,261 ($2,965,734 at MU)

External

High Power Density Motor Equipped with Additively Manufactured Windings Integrated with Advanced Cooling and Modular Integrated Power Electronics — **Co PI**, *2021-2025*
DOE ARPA-E Aviation Class Synergistically Cooled Electric-Motors with Integrated Drives (ASCEND)
$5,500,000 Federal, Phase I: $1.6M (announced), Phase II: $3.9M (contingent on Phase I milestones)
PI: Ayman EL-Refaie

eXtreme Power Conversion (XPC) Program — **Co-PI**, *2020-2021*
Midwest Energy Research Consortium (M-WERC)
$200,000 - (MU/Weise Allocation: $70,000) *Co-PI: Rob Cuzner (UW-Milwaukee), Giri Venkataramanan (UW-Madison)*

Ultra Fast Resonant DC Breaker — **Lead PI**, *2019-2021*
Department of Energy (DOE) Advanced Research Project Agency Energy (ARPA-E) BREAKERS
$500,000 *Co-PI: Ayman EL-Refaie, Philip Voglewede, Jiangbiao He (U. Kentucky)*

Advanced Parallel Resonant 1MHz, 1MW, Three Phase AC to DC Ultra Fast EV Charger — **Lead PI**, *2018-2020*
Department of Energy (DOE) Advanced Research Project Agency Energy (ARPA-E) CIRCUITS
$665,734 *Co-PI: Anthony Bowman*

Efficiency of Maine **Co-PI**
Energy Efficiency Innovation *2012–2013*
$100,000 - *(Allocation: $80,000) PI: Carsten Steenberg*

Initiative for Renewable Energy & the Environment Seed Grant **Co-PI**
Universal Utility Interface for Plug-in Hybrid Electric Vehicles with Vehicle-to-Grid Functionality *2009*
$70,527 *(Allocation: $50,000) PI: Ned Mohan*

External Pending

Re-thinking solar energy delivery: Non-wire solar-powered energy-carriers, integrated with utility-scale generation, to advance solar adoption to 30% of the total generation before 2030 **Co PI** *2020*
DOE EERE Solar Energy Technology Office FOA 2020
$2,000,000 *PI: Ranjan Gupta*

Internal

Additively-Manufactured Motor with Integrated Cooling and Distributed Power Electronics **Co-PI**
Marquette Opus College of Engineering GHR Seed funding *2019-2020*
$75,000 - (Weise Allocation: $15,000) *PI: Ayman EL-Refaie, Co-PI: Dinc Erdeniz, John Moore*

Class 8 Commercial Truck Electrified Technology and Infrastructure **Lead PI**
Marquette Opus College of Engineering William and Nancy Stemper Award *2019-2020*
$20,000

Marquette Opus College of Engineering Michael J Wallace Award **Lead PI**
Novel Gallium Nitride Power Converter for Industrial and Transportation Applications *2018-2019*
$20,000

Marquette University 2018 Explorer Challenge **Lead PI**
High Power Density and High Efficiency Level 2 Electric Vehicle Charger with Wide Band Gap Devices *2017-2019*
$25,000

Marquette College of Engineering Research Equipment Award **Lead PI**
Hardware-in-the-loop Power Emulation System *2015*
$10,000 *Co-PI: Nabeel Demerdash*

Pre-Tenure Research and Creative Activity Fellowship **Lead PI**
Ocean Wave Energy Harvesting *2013*
$25,000

UMaine Curriculum Fee 2012 **Lead PI**
PCB Fabrication Center for Undergraduate Education *2012*
$26,000

UMaine CETA Active Learning Grant 2011 **Lead PI**
Electric Drive Inverter for Undergraduate Education Lab *2011*
$1,000

Journal Papers (Peer Reviewed)

H-index 13 (Google Scholar)
Total Citations: 573 (Google Scholar)
Author names marked with * denote graduate students advised by Dr. Weise
Author names marked with ** denote undergraduate students advised by Dr. Weise
Author names marked with # denote Post Doc advised by Dr. Weise
Author names italicized denote students

Marquette University 2014 - Present

[J12] M. Abarzadeh#, S. Peyghami, K. Al-Haddad, N. Weise, L. Chang, and F. Blaabjerg, "Reliability and performance improvement of puc converter using a new single-carrier sensor-less pwm method with pseudo reference functions," *IEEE Transactions on Power Electronics*, vol. 36, no. 5, pp. 6092–6105, 2021.

[J11] M. T. Fard, *Waqar Khan**, J. He, N. Weise, and M. Abarzadeh#, "Fast online diagnosis of open-circuit switching faults in flying capacitor multilevel inverters," *Chinese Journal of Electrical Engineering*, vol. 6, no. 4, pp. 53–62, 2020.

[J10] M. Abarzadeh#, *Waqar Khan**, N. Weise, K. Al-Haddad, and A. M. EL-Refaie, "A new configuration of modular multilevel converter based on parallel connection of 3l-anpc converters controlled by improved modulation method for 1mhz, 1mw ev charger," *IEEE Trans. Ind. Appl.*, 2020.

[J9] R. Baranwal, N. Weise, K. Basu, and N. Mohan, "A bidirectional soft-switched dab based single stage three phase ac-dc converter for v2g application," *IEEE Trans. Transport. Electrific.*, vol. 5, no. 1, pp. 186–199, Mar. 2019.

[J8] *R. Katebi**, *J. He*, and N. Weise, "Investigation of fault tolerant capabilities in an advanced three-level active t-type converter," *IEEE Trans. Emerg. Sel. Topics Power Electron.*, vol. 7, no. 1, pp. 446–457, Mar. 2019.

[J7] *R. Katebi**, *J. He*, and N. Weise, "An advanced three-level active neutral-point-clamped converter with improved fault-tolerant capabilities," *IEEE Trans. Power Electron.*, vol. 33, no. 8, pp. 6897–6909, Aug. 2018.

[J6] *J. He*, *R. Katebi**, and N. Weise, "A current-dependent switching strategy for si/sic hybrid switch-based power converters," *IEEE Trans. Ind. Electron.*, vol. 64, no. 10, pp. 8344–8352, Oct. 2017.

[J5] D. Varajão, R. E. Araújo, L. M. Miranda, J. P. Lopes, and N. D. Weise, "Control of an isolated single-phase bidirectional ac-dc matrix converter for V2G applications," *Electric Power Systems Research*, vol. 149, pp. 19–29, 2017.

[J4] *Jiangbiao He*, N. A. Demerdash, N. Weise, and *Ramin Katebi**, "A fast on-line diagnostic method for open-circuit switch faults in sic-mosfet based t-type multilevel inverters," *IEEE Trans. Ind. Appl.*, vol. 53, no. 3, pp. 2948–2958, May 2017.

[J3] *Jiangbiao He*, N. Weise, *Ramin Katebi**, N. A. Demerdash, and L. Wei, "A fault-tolerant t-type multilevel inverter topology with increased overload capability and soft-switching characteristics," *IEEE Trans. Ind. Appl.*, vol. 53, no. 3, pp. 2826–2839, May 2017.

[J2] *Asa Sproul** and N. Weise, "Analysis of a wave front parallel wec prototype," *IEEE Transactions on Sustainable Energy*, vol. 6, no. 4, pp. 1183–1189, Oct. 2015.

University of Maine 2011 - 2014

[J1] N. Weise, K. Basu, G. Castelino, and N. Mohan, "A single-stage dual active bridge based soft switched ac-dc converter with open-loop power factor correction and other advanced features," *IEEE Trans. Power Electron.*, vol. 29, no. 8, pp. 4007–4016, Aug. 2014.

Journal	J12	J11	J10	J9	J8	J7	J6	J5	J4	J3	J2	J1
Citations	0	0	0	5	8	15	28	9	35	22	8	86
Impact Factor	7.224	3.347	N/A	5.27	7.224	7.224	7.503	3.022	3.347	3.347	7.65	7.224

Conference Papers (Peer Reviewed)

Marquette University 2014 - Present

[C22] *Sina Vahid*, M. Abarzadeh#, N. Weise, and A. EL-Refaie, "A novel three-port dc-dc power converter with adaptive boundary current mode controller for a residential pv-battery system," in ***(Accepted for Publication)*** *Proc. IEEE Industrial Electronics Society (IECON)*, Nov. 2020.

[C21] *Trevor Arvin*, J. He, and N. Weise, "Modeling and simulation of an ultra-fast resonant dc circuit breaker based on current source module," in ***(Accepted for Publication)*** *Proc. IEEE International Power Electronics and Motion Control Conference (ECCE-Asia)*, Nov. 2020.

[C20] M. Abarzadeh#, N. Weise, K. Al-Haddad, and L. Chang, "A new constant switching frequency model predictive control method for grid connected 5-level anpc inverter with capacitors sensor-less voltage balancing," in ***(Accepted for Publication)*** *Proc. IEEE Energy Conversion Congress and Expo (ECCE)*, Oct. 2020.

[C19] M. Abarzadeh#, N. Weise, *R. Katebi**, A. Javadi, and K. Al-Haddad, "Constant switching frequency hierarchical deadbeat predictive direct power controller with dynamic power estimator for 3l-anpc afe rectifier for ev charger applications," in *2020 IEEE Transportation Electrification Conference Expo (ITEC)*, Jun. 2020, pp. 1006–1011.

[C18] *Waqar A. Khan**, *Sina Vahid*, *Md Rakib-Ur Rahman**, *Ramin Katebi**, A. EL-Refaie, and N. Weise, "An optimized phase shifted pwm for flying capacitor multilevel converter," in *Proc. IEEE Energy Conversion Congress and Expo (ECCE)*, Sep. 2019, pp. 5104–5108.

[C17] *Ramin Katebi**, J. He, *Timothy Bobeck***, *Waqar Khan**, and *Nathan Weise**, "High-efficiency fault-tolerant three-level sic active npc converter for safety-critical renewable energy applications," in *2019 IEEE 10th International Symposium on Power Electronics for Distributed Generation Systems (PEDG)*, Jun. 2019, pp. 665–669.

[C16] *R. Katebi**, J. He, *W. A. Khan**, and N. Weise, "Efficiency improvement of fault-tolerant three-level power converters," in *2018 IEEE Transportation Electrification Conference and Expo (ITEC)*, Jun. 2018, pp. 1054–1059.

[C15] *J. He*, *H. Chen*, *R. Katebi**, N. Weise, and N. A. O. Demerdash, "Mitigation of uneven surge voltage stress on stator windings of induction motors fed by sic-mosfet-based adjustable speed drives," in *Proc. IEEE International Electric Machines and Drives Conference (IEMDC)*, May 2017, pp. 1–7.

[C14] J. Rohrer, N. Weise, T. Dewhurst, and M. Macnicoll, "Testing and modelling the rti f2 qd wec," in *European Wave and Tidal Energy Conference (EWTEC)*, Aug. 2017, pp. 1–5.

[C13] *J. He*, N. Weise, L. Wei, and N. A. O. Demerdash, "A fault-tolerant topology of t-type npc inverter with increased thermal overload capability," in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Sep. 2016, pp. 1065–1070.

[C12] *Jiangbiao He*, N. Weise, *Ramin Katebi**, L. Wei, and N. Demerdash, "A fault-tolerant t-type multilevel inverter topology with soft-switching capability based on si and sic hybrid phase legs," in *Proc. IEEE Energy Conversion Congress and Expo (ECCE)*, Sep. 2016, pp. 1–7.

[C11] *R. Katebi**, *A. Stark*, *J. He*, and N. Weise, "Advanced three level active neutral point converter with fault tolerant capabilities," in *Proc. IEEE Energy Conversion Congress and Expo (ECCE)*, Sep. 2016, pp. 1–7.

[C10] *A. R. Prabu** and N. Weise, "Bidirectional sic three-phase ac-dc converter with dq current control," in *2015 IEEE Energy Conversion Congress and Exposition (ECCE)*, Sep. 2015, pp. 3474–3481.

[C9] *Arjun Andhra** and N. Weise, "Dc ripple current rejection in a bidirectional sic single-phase ac-dc converter for v2g application," in *Proc. IEEE Transportation Electrification Conference and Expo (ITEC)*, Jun. 2015, pp. 1–7.

[C8] *Arjun Andhra** and N. Weise, "Implementation and validation of dq current control of a bidirectional sic single-phase ac-dc converter," in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Mar. 2015, pp. 3143–3149.

University of Maine 2011 - 2014

[C7] *Lance Doiron*** and N. Weise, "Dq current control of a bidirectional, isolated single-stage ac-dc converter," in *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Mar. 2014, pp. 1888–1893.

[C6] N. Weise, "Dq current control of a bidirectional, isolated, single-stage ac-dc converter for vehicle-to-grid applications," in *Proc. IEEE Power and Energy Society General Meeting July 21-25*, 2013, pp. 1–5.

[C5] *Nathan Reimensnyder** and N. Weise, "Voltage control of a single phase, single-stage, isolated ac-dc converter," in *Proc. IEEE Transportation Electrification Conference and Expo, June 16-19*, 2013, pp. 1–5.

[C4] G. Castelino, K. Basu, N. Weise, and N. Mohan, "A bi-directional, isolated, single-stage, dab-based ac-dc converter with open-loop power factor correction and other advanced features," in *Proc. IEEE International Conference on Industrial Technology (ICIT'12)*, Mar. 2012, pp. 938–943.

University of Minnesota 2001 - 2011

[C3] N. Weise, K. Basu, and N. Mohan, "Advanced modulation strategy for a three-phase ac-dc dual active bridge for v2g," in *Proc. IEEE Vehicle Power and Propulsion Conference (VPPC'11)*, Sep. 2011, pp. 1–6.

[C2] N. Weise, K. Mohapatra, and N. Mohan, "Reducing harmonics in bidirectional utility interface for plugin hybrid electric vehicles," in *in Proc. Grand Challenges in Modeling and Simulation*, Jul. 2010, pp. 1–5.

[C1] N. Weise, K. Mohapatra, and N. Mohan, "Universal utility interface for plug-in hybrid electric vehicles with vehicle-to-grid functionality," in *Proc. IEEE Power and Energy Society General Meeting*, Jul. 2010, pp. 1–8.

Conference	C18	C17	C16	C15	C14	C13	C12	C11	C10	C9	C8	C7	C6	C5	C4	C3	C2	C1
Citations	0	0	1	8	0	7	5	6	5	4	3	2	5	0	19	25	0	22

Conference Papers Under Review

[c3] *Waqar Khan*, *Armin Ebrahimian*, M. Abarzadeh#, and N. Weise, "State space based current sensorless finite control set - modulated modelpredictive control for a 5l-flying capacitor multilevel converter," in ***(Accepted)*** *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Mar. 2021.

[c2] *Waqar Khan*, *Armin Ebrahimian*, M. Abarzadeh#, and N. Weise, "Finite control set - modulated model predictive control for a 5l-flyingcapacitor multilevel converter," in ***(Accepted)*** *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Mar. 2021.

[c1] *Waqar Khan*, M. Abarzadeh#, and N. Weise, "A generalized scalable configuration of paralleled modular hybrid "si+sic" anpc converter for 1mhz, 1mwev mega charger," in ***(Accepted)*** *Proc. IEEE Applied Power Electronics Conference and Exposition (APEC)*, Mar. 2021.

Patents

- Jiangbiao He, Lixiang Wei, Nathan Weise, and Nabeel A.O. Demerdash, "A Novel Fault-Tolerant Topology for Multilevel NPC Converters with Improved Overload Capability," Provisional Application No. 62/255,075, 2016.
- R. Gupta, K. Mohapatra, N. Mohan, G. Castelino, K. Basu, N. Weise, "Soft Switching Power Electronic Transformer," U.S. Patent: 8,446,743 B2, issued date May 21, 2013.

Service

University

- Department of EECE Visibility Committee Member, 2020-present
- Department of EECE Faculty, TA, and RA Awards Committee Chair, 2020
- Department of EECE Laboratory Hardware and Software Committee Member, 2020
- Department of EECE Undergraduate Committee Member, 2015-2019, meets once a week fall semester and once every other week spring semester, committee considers all undergraduate affairs.
- Marquette College of Engineering Academic Dishonesty Committee Member, 2014-2015
- Department of EECE Graduate Committee Member, 2014-2015
- E-Week Power Electronic Lab Tours to students, faculty, staff, and parents (once a year)
- Open House Tours to prospective students, faculty, staff, and parents (1-2 times a month)
- Design Day Open Lab Power Electronics Tours to students, faculty, staff, and parents (once a year)
- Power Electronics Lab Recruiting Tours to potential students and parents (1-2 times a month)

Professional Service

APEC 2021 Professional Education Seminar

- Traditional & Emerging Digital Control Techniques in Power Electronics

– Created a 3 hour professional education seminar that is presented worldwide to international experts in the area of power and control

Created Course "Digital Control of Power Electronics" for CUSP Consortium of Universities for Sustainable Power (2018-2019)
– Designed complete course note set
– Designed complete course homework set
– Recorded full set of accompanying video lectures
– Class available to the world https://cusp.umn.edu

Department of Energy Wave Energy Prize Finalist - Team RTI (2015-2016)
– Electrical Engineer Team Lead
– Lead Design of control system, power conversion system, electric drive, and data acquisition system.

Professional Society Memberships
– *Member,* IEEE Power Electronics Society (PES), 2010-Present
– *Member,* IEEE Industrial Electronics Society (IES), 2010-Present
– *Member,* IEEE Vehicular Technology Society (VTS), 2010-Present
– *Member,* IEEE Power and Energy Society (PES), 2010-Present

Editor Service
– *Associate Editor,* IEEE Transactions on Industrial Applications, 2016 - Present

Peer Review Service
– *National Science Foundation Review Panelist,* Energy, Power, Control, and Networks 2019
– *Book Reviewer,* Power Electronics: A First Course, Wiley
– *Book Reviewer,* Electric Machines and Drives: A First Course, Wiley
– *Reviewer,* IEEE Transactions on Power Electronics, 2011 - Present
– *Reviewer,* IEEE Transactions on Industrial Electronics, 2011 - Present
– *Reviewer,* IEEE Applied Power Electronics Conference and Exposition, 2011 - Present
– *Reviewer,* IEEE Energy Conversion Congress and Exposition, 2011 - Present
– *Reviewer,* IEEE Transportation Electrification Conference and Exposition, 2011 - Present
– *Reviewer,* IEEE Transactions on Sustainable Energy, 2014 - Present

Conferences and Meetings
– *Session Chair,* Energy Conversion Congress and Expo, Baltimore, MD, Sep. 29-Oct. 3, 2019.
– *Session Chair,* Applied Power Electronics Conference and Exposition, Anaheim, CA, Mar. 16-21, 2019.
– *Session Chair,* Energy Conversion Congress and Expo, Portland, OR, Sept. 23-27, 2018.
– *Session Chair,* IEEE Transportation Electrification Conference and Expo, Long Beach, CA, June 13-15, 2018.
– *Topic Chair, Session Chair,* Energy Conversion Congress and Expo, Milwaukee, WI, Sept. 18-22, 2016.
– *Session Chair,* Applied Power Electronics Conference and Exposition, Long Beach, CA, Mar. 20-24, 2016.
– *Session Chair,* Energy Conversion Congress and Expo, Montreal, CAN, Sept. 20-24, 2015.
– *Session Chair,* Applied Power Electronics Conference and Exposition, Charlotte, NC, Mar. 15-19, 2015.
– *Session Chair,* Applied Power Electronics Conference and Exposition, Dallas, TX, Mar. 16-20, 2014.

Community Service

- La Crosse Thanksgiving Community Dinner - Volunteer and serve community members with a free Thanksgiving dinner (2001-Present)
- Volunteer Foster Parent Rescue Gang, Milwaukee, WI (2014-2019)
- Volunteer Foster Parent Bangor Humane Society (2011-2013)
- Habitat For Humanity - Built new homes in Jacksonville Beach, Florida (2009)