

# CHRISTOPHER D. SCHMITZ

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## EDUCATION

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|------------|---|------|
| <b>PhD</b> | University of Illinois, Electrical Engineering<br>“Spatial-Temporal Multiuser Receivers for CDMA-Based Communications”<br>S. J. Franke (chair), W. K. Jenkins (advisor), D. L. Jones, R. Koetter, K. Gallivan | 2002 |
| <b>MS</b>  | University of Illinois, Electrical Engineering<br>“Adaptive Fault Tolerance in Two-Dimensional Systems”, W. K. Jenkins (advisor)  | 1996 |
| <b>BS</b>  | University of Illinois, Electrical Engineering<br>Graduated High Honors   | 1993 |

## HONORS AND AWARDS

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- List of Teachers Ranked as Excellent by their Students**, University of Illinois  
Fall 2019, Fall 2018, Spring 2018, Fall 2017, Fall 2016, Spring 2016, Fall 2015, Spring 2011
- Bronze Tablet**, Top 3% of college graduating class, University of Illinois 1993
- NSF Graduate Fellowship Honorable Mention**, University of Illinois 1993
- Honor Societies**, University of Illinois 1993  
Phi Eta Sigma, Golden Key, Eta Kappa Nu, Tau Beta Pi, Phi Kappa Phi
- Scholarship Awards**, University of Illinois 1991-1992  
Alcoa Foundation, Frank C. Mock, Dow Chemical Foundation
- High School Valedictorian, President of NHS**, Pana Senior High, Pana, IL 1988

## POSITIONS HELD (CHRONOLOGICALLY)

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|---|-----------------|
| <b>University of Illinois, Urbana, IL</b> |                 |
| Teaching Associate Professor              | 2019 to present |
| Senior Lecturer                           | 2014 to 2019    |
| Chief Undergraduate Advisor               | 2012 to present |
| Lecturer                                  | 2011 to 2014    |
| Visiting Lecturer                         | 2004 to 2011    |
| Research Specialist                       | 2003 to 2011    |
| Visiting Research Specialist              | 2002 to 2003    |
| Graduate Research Assistant               | 2001-2002       |
| Graduate Teaching Assistant               | 1997-2001       |

**TRW Aerospace**, Redondo Beach, CA 1995 to 1997  
Systems Engineer (Member of Technical Staff-Level II), Space & Electronics Group  
*Designed and tested satellite-to-satellite communications; tested and verified satellite-based adaptive-nulling antenna array.*

**University of Illinois**, Urbana, IL  
Graduate Teaching Assistant 1993-1995  
Research Assistant (Ionized Source Beam Epitaxy, under K. Kim) 1992  
Electronics Technical Assistant (Center for Supercomputing R&D) 1990-1992

## GRANT AND CONTRACTS

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**University of Illinois**, Urbana, IL  
Herman, G., Schmitz, C. (co-PI), Varodayan, D., Minin, M., Goddard, L., Loui, M., Kudeki, E., Franke, P., et. al. – “Improving Students’ Learning and Experience in ECE 110”, SIIP/Wider Grant. 2014-2017

Bernhard, J. T., and Jones, D. L., Schmitz, C. (team member) – “High-Resolution DoA Determination with Electrically Small Antenna”, United States Army Research Office. 2009-2013

Loui, M. and Schmitz, C. (co-PI) – “Enhancing the ECE101 Curriculum Through Diversity Harnessing”, using student-generated interests to personalize the course applications, NSF Grant DUE-0942331 (\$200,000). 2010-2014

Schmitz, C., (team member) – “Intelligent Hearing Aid Project (IHAP)”, innovative improvements to hearing-aid design including, multi-microphone arrays, binaural data processing, dichotic presentations, wireless communications across the head, and amplitude-based improvement in directivity. NIH R01 DC005762-01A1. 2002-2010

## COURSES TAUGHT

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**University of Illinois**, Urbana, IL 1993-present  
ECE 101 Exploring Digital Information Technology (*lecturer and course developer*)  
ECE 110 Introduction to Electronics (*lecturer, course director, and course developer*)  
ECE 444 Integrated Circuit Fabrication (*teaching assistant*)  
ECE 453 Wireless Communication Systems (*teaching assistant*)  
ECE 459 Communications I (*lecturer*)  
ECE 445 Senior Project Design (*teaching assistant*)  
ECE 463 Digital Communications Laboratory (*lecturer and course developer*)

## PATENTS

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Malick, C., Qi, X., Parikh, M., Franke, S., Jones, D. L., Larsen, J. B., Schmitz, C. D., Callias, F., “Electrode Placement for Wireless Intrabody Communication Between Components of a Hearing System,” Unites States Patent, No. 7,512,448 B2. Mar 31, 2009.

## PUBLICATIONS

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### Teaching and Learning

Schmitz C., Herman G., Bretl T. (2020, in press). “The Effects of Second-Chance Testing on Grade Distributions in a First-Year Stem Course,” *Proceedings of ASEE Annual Virtual Conference 2020*.

Angrave L., Jensen K., Zhang Z., Mahipal C., Mussulman M., Schmitz C., Baird, R., Liu H., Sui R., Wu M., Kooper R. (2020, in press). “Improving student accessibility, equity, course performance, and lab skills: How introduction of ClassTranscribe is changing engineering education at the University of Illinois,” *Proceedings of ASEE Annual Virtual Conference 2020*.

Revelo, R. A., Schmitz, C. D., Duyen, T., and Loui, M. C., “Self-Efficacy as a Long-Term Outcome of a General Education Course on Digital Technologies,” vol. 60, no. 3, *IEEE Transactions on Education*, Jan. 2017, pp. 198 - 204.

Minin, S., Varodayan, D. P., Schmitz, C. D., Faulkner, B., Choi, D. S., and Herman, G. L., “Minority Merit: Improving retention with cooperative learning in a first-year electronics course”, *Frontiers in Education Conference (FIE)*, Oct. 2016, DOI: 10.1109/FIE.2016.7757611.

Schmitz, C. D., Revelo Alonso, R. A., Loui, M. C., “Work in progress–Diversity harnessing in a general education course on digital information technology”, *Proceedings–Frontiers in Education Conference*, Oct 2011, DOI: 10.1109/FIE.2011.6142922.

### Signal Processing and Wireless Devices

Slater, M. J., Schmitz, C. D., Anderson, M. D., Jones, D. L, and Bernhard, J. T., “Demonstration of an Electrically Small Antenna Array for UHF Direction-of-Arrival Estimation”, *IEEE Transactions on Antennas and Propagation*, Mar 2013, vol. 61., no. 3, pp. 1371 – 1377.

Slater, M.J., Schmitz, C.D., Jones, D.L., and Bernhard, J.T., “Resolution Limitations in UHF Direction of Arrival Estimation Using Electrically Small Arrays”, *Antenna Applications Symposium*, Sep. 2011.

Zheng, G, Dong, Han, Zheng, R., Schmitz, C., and Yuan, X., “A Link Quality Inference Model for IEEE 802.15.4 Low-Rate WPANs”, *IEEE Global Telecommunications Conference (GLOBECOM 2011)*, Dec. 2011, DOI: 10.1109/GLOCOM.2011.6133782.

Park, K. J., Park, T. R., Schmitz, C. D., and Sha, L., "Design of robust adaptive frequency hopping for wireless medical telemetry systems", IET Communications, vol. 4, no. 2, Feb. 2010, pp. 178-191.

Park, K. J., Park, T. R., Schmitz, C. D., and Sha, L., "Entropy-maximization based adaptive frequency hopping for wireless medical telemetry systems", Proceedings of the 1st ACM international workshop on Medical-grade wireless networks, Apr 2009, DOI: 10.1145/1540373.1540378, pp. 15-20.

Schmitz, C., Iyer, N., Lockwood M. E., Lansing, C. R., and Jones D.,L., "Enhanced BTE Directivity Using a Directional Microphone Array," International Hearing Aid Research Conference, Tahoe City, CA, Aug. 2004.

Larsen, E., Schmitz, C., Lansing, C. R., O'Brien, W. D., Wheeler, B. C., and Feng, A. S., "Acoustic scene analysis using estimated impulse responses", Conference Record of the (2004) Thirty-Seventh Asilomar Conference on Signals, Systems and Computers, Nov. 2003, vol. 1, pp. 725-729.

Schmitz, C. D., Koetter, R., and Jenkins, W. K., "A new approach to soft parallel interference cancellation for synchronous CDMA", The 45th Midwest Symposium Circuits and Systems, Sep. 2002, DOI: 10.1109/MWSCAS.2002.1186961.

Schmitz, C. D., and Jenkins, W. K., "Adaptive noise subspace construction for harmonic retrieval", Proceedings of the 1999 IEEE International Symposium on Circuits and Systems, Aug. 1999, DOI: 10.1109/ISCAS.1999.778775.

Schmitz, C. D., and Jenkins, W. K., "An algorithm-based fault-tolerant method for the 2-D LMS algorithm", Proceedings of the 1998 IEEE International Symposium on Circuits and Systems, Jan. 1998, DOI: 10.1109/ISCAS.1998.694472.

Jiang, J., Schmitz, C. D., Schnaufer, B., and Jenkins, W. K., "Improved fault coverage for adaptive fault tolerant filters", International Conference on Acoustics, Speech, and Signal Processing, May 1997.

Jiang, J., Schmitz, C. D., Schnaufer, B., and Jenkins, W. K., "The use of adaptive fault tolerance in general classes of linear systems", IEEE 39th Midwest symposium on Circuits and Systems, Sep 1996, DOI: 10.1109/MWSCAS.1996.593056.

Schmitz, C. D. and Jenkins, W. K. "Adaptive fault tolerance in two-dimensional systems", International Symposium on Circuits and Systems, Jun 1996, DOI: 10.1109/ISCAS.1996.540388.

## RESEARCH ADVISEES

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### Graduate and Senior Thesis

- Miao (Jimmy) He, M.Eng. (advisor), “Exploiting the Potential of nRF24L01 and WaggleNetNet”, 2020
- Nomaan Dossaji, ECE 597, spring 2019
- Erica L. Daly, Ph.D. (committee member), “Wideband Spectrum Sensing Using Rapidly Tuned Antennas”, 2016
- Matthew J. Slater, Ph.D., (committee member), “Design and Analysis of Direction-of-Arrival Systems Using Electrically-Small Antenna Arrays”, 2012
- Dan Hu, M.S. (co-advisor), "FPGA-Based Digital Phase-Locked Loop Analysis and Implementation", 2011
- Matthew Richerson, B.S. (senior thesis advisor), "Software Implementation of a Digital Radio Mondiale Receiver", 2012

### Undergraduate Research Projects

**WaggleNet:** a multi-faceted student research group dedicated to streamlining data collection with solar-powered, adaptive-mesh networking sensor nodes with particular focus on beekeeping and 24/7 agricultural monitoring. Winner of the Siddharth ‘Sid’ Muthal Memorial ECE Undergraduate Student Entrepreneur of the Year Award and Leung Student Venture Fund Award, 2017-current.

- Jimmy He, *WaggleNet* team leader from 2017-2020, ECE 397 fall 2017
- Jiaqi Lou, ECE 397 spring 2020
- Cameron Fuller, ECE 297 spring 2020
- Robbi Krokos, ECE 397 spring 2020
- Jyotsna Joshi, ECE 297 spring 2020
- Eric Dong, ECE 297 spring 2019
- Kyle Tolentino, ECE 297 spring 2019
- Jiachen Tu, ECE 297 spring 2019
- Xiaolin (Elena) Wu, ECE 397 spring 2018
- Chak Ho (Steven) Chan, ECE 397 spring 2018
- Ziwei Zhu, ECE 397 spring 2018
- Oreoluwa Sunmola, ECE 297 spring 2018, ECE 397 spring 2019

### Other Individual Studies:

- Kelsey Chang, ECE 297 spring 2020
- Vincent McKibben, ECE 297 spring 2020
- Sasan Erfan, ECE 397 spring 2019
- Kunakorn Puntawong, “Thai Academy”, 2017
- Andy Chen, Yaning Lan, and Krystal Wu, “Automated IoT Cat Feeder”, 2017
- Jane Folliard, “PCB Keyboard”, 2017
- Brian Chen, “Persistence of Vision”, 2016
- Abhinav Das, “Persistence of Vision”, 2016
- Dohun Jeong, “Low-Volt Vacuum Tubes”, 2016
- Xuanying Li, “Queen Bee Piping Signal Processing”, 2016
- Ryan Stark, "Learning Platform for Multi-Microphone Speech Processing", 2016
- Johnathon Karcz, "Design and Build of a 3D Printer", 2015

Harsh Modhera, "Raspberry Pi-Camera, Aid for the Blind", 2015  
 Ryan Wallace, "Sound Recording Hardware for In the Bee Hive", 2015  
 Shree Dash, "Construction of an Apidictor for Queen Bee Sound Detection", 2014  
 Balaji Pandurangan Baskaran, "Receivers Using the RTL- SDR R820T", 2013  
 Yohann Puri, "iOS Application for General Education Course Selection", 2013  
 Neeraj Chemburkar, "BlueTooth on a Glove", 2012-2013  
 Jacob Hudson, "Turnkey Camera Box for Visually-Impaired Students", 2012-2013  
 Vrishin Subramaniam, "Prototype Kit-Based Autonomous Vehical", 2012-2013  
 Ying He, "USRP Receiver for ADS-B Aircraft Transponders", 2012  
 Rishi Ratan, "USRP Receivers", 2011  
 Jo Bitto, "Wireless Energy Harvesting", 2011  
 Bryan Paul, "Fully Configurable OFDM SDR Transceiver in LabVIEW", 2010  
 Jeffrey Nelson, "Keyless Dorm Entry", 2010  
 Niranjana Venkatesan, "Single-Button, Multi-State Wireless Blinds", 2010  
 Armaan Pandey, 2010  
 David Capota, 2010  
 Hsin-Min Cheng, 2010  
 Ching-Yueh Kao, 2010  
 Zih-Ling Liu, 2010  
 Ian (Beanz) Ramirez, 2009

### **James Scholar's Honors Lab**

With the critical aid of an undergraduate staff, I also supervise and provide feedback regarding the projects of 40-80 students per semester in the ECE110 James Scholar's Honors lab each semester. <https://wiki.illinois.edu/wiki/display/ECE110HLSF15/>. 2013-present

## **PRESENTATIONS AND INVITED LECTURES**

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### **ASEE 2020 Virtual Annual Conference**

Presenter, "The Effects of Second-Chance Testing on Grade Distributions [...]," 2020

**Collins Scholars Guest Panelist**, Testing and other Student Assessments, University of Illinois. 2016, 2017 and 2019

**Workshop Presenter**, "Laboratory Instruction in Engineering: Make Labs Fun and Engaging," University of Illinois Graduate Academy. 2009, 2010, 2011, 2012, and 2013

**Session Presenter**, "University Students Use the Flexibility of NI PXI RF Hardware to Create Receiver Designs," Chris Schmitz and George Papen, NI RF summit. 2007

**Keynote Contributor and Session Presenter**, "A New Digital Communications Educational Laboratory based on the NI-PXI Platform and LabVIEW," NI Week. 2006

### **Conference Session Moderator and Presenter**

Asilomar Conference on Signals, Systems, and Computers, "Intelligent Hearing Aids", Monterey, CA. 2003

## PROFESSIONAL TRAINING

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### **KEEN National Conference**

Engineering Unleashed, Dallas, TX

January 2020

Attended the workshops to learn about the Entrepreneurial Mindset and KEEN's approach to teaching and learning. Aided the Grainger College of Engineering to make a decision regarding the long-term value of a relationship of the University of Illinois with KEEN.

### **NETI-II**

Advanced National Effective Teaching Institute, Montreal, Canada

July 2014

Facilitated by three renowned experts in teaching-and-learning, Rebecca Brent, Richard Felder, and Michael Prince, and sponsored by the ASEE, NETI-II presented a holistic approach to course design and delivery.

### **CITL Workshop**

University of Illinois, Urbana, IL

2013-2014

Distinguished Teacher-Scholar Project: "Inquiry into the University Classroom: A Journey Toward Scholarly Teaching."

### **NI Academic Field Day Workshop**

National Instruments, Austin, TX

2011

Participant in a collaborative workshop on teaching RF comm in institutions nationwide.

### **Faculty Summer Institute**

University of Illinois, Urbana, IL

2009-2016

This conference features keynote presentations, networking, and hands-on training on the use of modern communication and information technologies in education.

### **Technology-Enhanced Teaching**

University of Illinois, Urbana, IL

2009

CITES Research and Learning Technologies book series on technology-enhanced scholarly teaching-and-learning.

### **Distance Learning Seminar**

University of Illinois, Urbana, IL

2007

Library and Information Science symposium on distance learning.

## PROFESSIONAL SERVICE

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### **Instructional Contingency Planning Task Force**

Identify different models for instructional delivery in fall 2020

2020

### **Promotions Review Committee**

ECE Specialized Faculty

2020

<b>The Institute for Inclusion, Diversity, Equity, and Access</b>	
Affiliate member	2020
<b>Senate of the Urbana-Champaign Campus</b>	2020-2022
University of Illinois	
“[The] Senate helps shape key policies, processes, and decisions of importance to our campus, community, state, nation, and world.”	
<b>Search Committees</b>	
ECE Head Search Committee	2019
Assistant Dean of the College of Engineering	2018
Specialized Faculty in ECE	2016-2018
<b>AE3 Education Innovation Fellow (EIF)</b>	2018-present
College of Engineering at the University of Illinois	
<i>Connecting Role:</i> Interact with AE3 staff, departmental colleagues, and others across the College involved in educational innovation to share and unify educational efforts. <i>Innovating role:</i> Identify and pursue new pathways, helping to pave the way for educational change.	
<b>FAIR Appeal Manager for ECE</b>	2014-present
Assist in student appeals for academic integrity violations. Have also served on FAIR appeal hearings as needed, often training the committee chair on hearing protocol.	
<b>Midwestern Robotics Design Competition</b>	2014-present
Faculty advisor for the Midwestern Robotics Design Competition is an annual competition that started in 1987, one of the oldest continuing robotics competitions in America.	
<b>ECE Curriculum Committee</b>	2012-present
New course evaluation/approval and proposed curriculum changes.	
<b>Teaching Professionals Program (TPro2)</b>	2016-present
ECE 110 lecture opened to Collins Scholars new-teaching faculty.	
<b>LMS Instructor Focus Group</b>	Spring 2016
Focus group, led by Roberts-Lieb, shed light on desired features of the ideal Learning Management System.	
<b>International University, Ho Chi Minh City, Vietnam</b>	August 2009
School of Electrical and Computer Engineering at International University, tasks included training of staff members on equipment, discussions regarding accreditation, evaluation of current curriculum, recommendations for additional curriculum, and seminars regarding the use of Software-Defined Radio techniques in Communications laboratories.	
<b>Learning Stacks Focus Group</b>	Spring 2009
Focus group led by Leslie Hammersmith to explore and disseminate advantages of teaching-and-learning with technology.	



## COMMUNITY SERVICE

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<b>Royal Ag 4-H</b> , Royal, IL Youth group leader	2018-present
<b>St. Patrick's Church</b> , Urbana, IL Religious Education Teacher	2018-present
<b>Royal Youth League</b> , President, Royal, IL President (2010 – present), Coach (as needed)	2010-2018
<b>St. Lawrence Church</b> , Penfield, IL Trustee, Extraordinary Eucharistic Minister, and Director of Religious Education	2010-2018
<b>GLEE (Girls Learning Electrical Engineering)</b> , University of Illinois	2012