

Dieff Vital, Ph.D.

Chicago, IL 60607, dvital@uic.edu



Professional Experience

Assistant Professor, University of Illinois Chicago

August 2023-Present

Tenure-Track Professor

Department of Electrical and Computer Engineering

Postdoc, University of Illinois Chicago

August 2021-August 2023

Bridge to Faculty (B2F) Postdoctoral Associate

Department of Electrical and Computer Engineering

RF Engineer, Sensatek Propulsion Technologies, Inc.

April 2021-June 2021

Passive RF sensing for turbine blades

Academic Degrees & Honors

Ph.D., Florida International University

April 2021

Electrical and Computer Engineering GPA- 3.84/4.0

- McKnight Dissertation Year Fellowship (2020-2021)
- Dissertation defended and approved as of March 26, 2021

MS, Florida International University

Dec. 2020

Electrical and Computer Engineering GPA-3.84/4.0

- SGA Graduate Scholarship (2018-2019, 2019-2020)

BS, Florida Polytechnic University

May 2017

Mechanical and Industrial Engineering GPA-3.97/4.0 (*Summa Cum Laude*)

- Presidential List (Fall 2015, Fall 2016, Spring 2017)
- Provost's List (Spring 2016)

Associate in arts, Miami Dade College

Dec. 2014

Mechanical and Industrial Engineering GPA-3.95/4.0 (*Highest Honors with Distinction*)

- Dean's List (Spring 2013, Fall 2013, Spring 2014, Fall 2014, Spring 2015)
- Mathematics Award (April 2014)
- Basketball Properties Scholarship

Research Experience and other Work Experience

Bridge-to-the-Faculty Postdoctoral Research Associate

The University of Illinois Chicago, Chicago IL

Aug. 2021-Present

- Developing textile-based solutions for infectious diseases, chronic wounds
 - Developing a dressing and sensing solution to continuously monitor the healing process of infectious wounds.
 - Using organic powders to be infused in thin films to heal wounds.
- Developing sensing platform to monitor the disordering activity from the gastro-intestinal track (gut)
- Developing novel textile-based pattern-reconfigurable antenna/antenna arrays for power transfer and harvesting for 5G applications
 - Developing smart clothes to power sensing network for medical purposes

Graduate Research Assistant

Florida International University (RFCOMLab), Miami FL

Oct. 2017-April 2021

- Developed near-field and far-field Wireless RF-Power harvesting systems for on-body sensors.
 - Prototyped the combination of antenna and power harvesting circuit on fabric.
 - Developing a flexible wireless sensor network for space, military, and health applications (a smart bandage for wound monitoring and sensing)

Research and Development in RF Engineering

Sensatek Propulsion Technologies, Inc., Daytona Beach, FL

Apr. 2021-Jun. 2021

- Developed RF sensors for extreme heat monitoring from gas turbines.

Undergraduate Research Assistant

Florida Polytechnic University, Lakeland, FL

Jan. 2016-Aug. 2017

- Developed low-cost dielectric cell to test the dielectric properties of epoxy/diatom composites.
 - Cultured diatoms that were later used to dope clay material.
 - Characterized the capacitive properties of phosphatic clay-diatom mixture.

**Academic Tutor for Statistics and Macro-Economics
Miami Dade College, Miami FL**

May. 2013-Aug. 2015

- Helped students who struggled in both statistics and macro-economics.

Professional Development

- **UCF Regional and NSF National Innovation Corps (I-Corps) program (2020-2021)**

Proposed a clothing-integrated wireless charging platform to help wearable electronic users to continuously power/charge their devices.

- Conducted more than 180 interviews with potential users and got their feedback.
- Discovered that:
 - (1) lack of charging can be a lifesaving grace for patients with charging needs for their medical devices
 - (2) wireless charging modalities will allow for less human-touch for COVID-19 patient, and
 - (3) wireless charging will help front line workers like nurses and firefighters to save lives while protecting their own
- Won a \$50,000-NSF grant to conduct interviews and further the line of research to get the technology ready for commercialization.

- **Midwest (University of Illinois Urbana-Champaign) Regional I-Corps (2021-2022)**

Proposed a wireless charging nest to provide phone users with convenient, hassle-free, and quick charging by reducing the charging time by 50% and providing an easy-to-use interface.

- Conducted more than 20 interviews with potential users and got their feedback.
- Based on their insights we inferred that we would provide them with:
 - (1) Convenience of universal charging
 - (2) Wireless charging at any time

Grant Funding

- Three Bids with One Stone: High-Frequency Instrumentation for Device Characterization and Future Radar and Communication System Measurement
 - Funding period: not specified.
 - Funding agency: Department of Defense (DoD)
 - Funding (amount) requested: \$ 599,680.00.
 - Grant status: approved for funding.
 - Project personnel: Danilo Erricolo (PI), Pai-Yen Chen (Co-PI) ..., Dieff Vital (Co-PI)
 - Percentage allocated to Vital: 7 % (intellectual credit)
- An Intelligent Wireless Sensing System of Sustainable and Multifunctional Bandages for Personalized Health Monitoring
Funding Period: 01/2023-07/2024
 - Funding Agency: DPI-Shield T3 Partnership in Personalized Health Diagnostics
 - Grant Status: Submitted
 - Project Personnel: Lin Cai (Co-PI), Dieff Vital (co-PI), Lulu Kang (co-PI)
 - Funding requested: \$ 240,000.00.
 - Percentage Allocated to Vital: 33.33% (\$80,000.00)
- Lab-in-an-Undergarment (LabUnder): Sensor-Equipped and AI-Driven Smart Undergarment for Real-Time Health Monitoring
Funding Period: 08/2023-02/2025
 - Funding Agency: Discovery Partners Institute
 - Grant Status: Submitted
 - Project Personnel: Dieff Vital (PI), Besma Smida (co-PI), Erdem Koyuncu, (co-PI), and Marco Mambelli (co-PI)
 - Funding requested: \$ 150,000.00.
 - Percentage Allocated to Vital: 16.67% (\$25,000.00)

Other Financial Support

- Real-Time and Continuous Monitoring of Chronic Wounds Using a Smart Bandage and a Mobile App
 - Funding period: 07/2022-06/2023

- Funding agency: The IEEE AP-S Summer Research Scholarship program
- Funding (amount) requested: \$ 3000.00 (to be given to undergraduate student)
- Grant status: approved for funding.
- Project personnel: Dieff Vital (PI)
- Percentage allocated to Vital: 100 % (intellectual credit)
- Towards the Engagement of Underrepresented Minority Students in STEM Topics at UIC
 - Funding period: 07/2022-06/2023
 - Funding agency: The UIC Institute for Research on Race and Public Policy
 - Funding (amount) requested: \$ 10,000.00.
 - Grant status: approved for funding.
 - Project personnel: Dieff Vital (PI)
 - Percentage allocated to Vital: 100 % (\$10,000.00)
- **Happy Cloth: A Sensor-Equipped Charging Platform Made of Fabric-Based, Biomimetic, Low-Cost, Low-Profile Resonators and Harvesting Circuits for Body-Worn Charging**
 - Funding Period: 09/2022-09/2023
 - Funding Agency: IEEE AP-S Education Committee
 - Grant Status: Approved
 - Project Personnel: Dieff Vital (PI)
 - Funding requested: \$ 5,000.00.
 - Percentage Allocated to Vital: 100% (\$5,000.00)

Research projects

1. **MagNest:** A charging nest for misalignment-free wireless charging of UAVs, vehicles, robots, IoT devices, portable devices (like phones, iPad, headphones, etc) and wearable devices (clothing-integrated platforms, smart bandages, etc).

Status: (a) *International patent filed with USPTO*

(b) *Participation at the regional I-Corps with University of Illinois Urbana-Champaign: \$8,000.00 (reimbursable) awarded for participating in the I-Corps cohort and to build a prototype (product-market fit)*

(d) *Mentoring a group of undergraduates for their ESRP project*

Personnel: Dieff Vital (PI) and Danilo Erricolo (Co-PI)

Grant Reviewer

- DEI Reviewer for Cures Within Reach, which is a non-profit organization devoted to improving patient quality and length of life through repurposing research (on a drug, device, diagnostic, nutritional product, or other therapy approved for human use in one disease or condition that can be used to create a medical solution in a different disease or condition)
- Reviewer for the 2022 IEEE Antennas and Propagation Society Pre-Doctoral Research Grants
- NSF Reviewer for the ENG ECCS Directorate in Communications, Circuits, and Sensing-Systems

Service to the ECE Department at UIC

- Served on multiple PhD candidate committees for a student investigating:
 - The Use of Graphene from Pencils to Build Environmental-Friendly Antennas and Microwave Circuits.
 - Novel Radio-Frequency Devices and Systems for Wearable Electronics and Wireless Power Transfer
 - Theoretical Modeling of Substrate-Integrated Impedance Surfaces (SIIS)

Classes Taught at UIC

Spring 2022 & 2023-ECE 520 Electromagnetic Field Theory

Journal Articles

1. **Vital, Dieff**, Shubhendu Bhardwaj, and John L. Volakis. "Textile-based large area RF-power harvesting system for wearable applications." *IEEE Transactions on Antennas and Propagation* 68, no. 3 (2019): 2323-2331. **(Finalist for an IEEE R.W. King Award)**
2. **Vital, Dieff**, Pawan Gaire, Shubhendu Bhardwaj, and John L. Volakis. "An ergonomic wireless charging system for integration with daily life activities." *IEEE Transactions on Microwave Theory and Techniques* 69, no. 1 (2020): 947-954.

3. **Vital, Dieff**, and Shubhendu Bhardwaj. "Misalignment resilient anchor-shaped antennas in near-field wireless power transfer using electric and magnetic coupling modes." *IEEE Transactions on Antennas and Propagation* 69, no. 5 (2020): 2513-2521.
4. **Dieff Vital**, Pulak Bhushan, Pawan Gaire, Md Khadimul Islam, Shashikant Lahade, Vladimir Pozdin, John L. Volakis, Shekhar Bhansali, Shubhendu Bhardwaj. "SkinAid: A Wirelessly Powered Smart Dressing Solution for Continuous Wound-Tracking Using Textile-Based Frequency Modulation." *IEEE Transactions on Biomedical Circuits and Systems* (2022): (Accepted)
5. Mao, Chun-Xu, **Dieff Vital**, Douglas H. Werner, Yuhao Wu, and Shubhendu Bhardwaj. "Dual-polarized embroidered textile armband antenna array with omnidirectional radiation for on-/off-body wearable applications." *IEEE Transactions on Antennas and Propagation* 68, no. 4 (2019): 2575-2584.
6. Gaire, Pawan, **Dieff Vital**, Md Rayhan Khan, Cherif Chibane, and Shubhendu Bhardwaj. "Adhoc mobile power connectivity using a wireless power transmission grid." *Scientific Reports* 11, no. 1 (2021): 1-10.
7. Martinez, Idellyse, Chun-Xu Mao, **Dieff Vital**, Hasan Shahariar, Douglas H. Werner, Jesse S. Jur, and Shubhendu Bhardwaj. "Compact, low-profile and robust textile antennas with improved bandwidth for easy garment integration." *IEEE Access* 8 (2020): 77490-77500.
8. Intikhab Hussain, Hamed Rahmani, **Dieff Vital**, Mahmoud Wagih, Alessandra Costanzo, Spyridon N. Daskalakis, Apostolos Georgiadis, Jasmin Grosinger, Diego Masotti, Kyriaki Niotaki, and Valentina Palazzi. "RF Identification and Novel IoT Technologies for Sensing and Communication." *IEEE Microwave Magazine* (2022): (Accepted).
9. Wagih, Mahmoud, Leonardo Balocchi, ..., **Dieff Vital**, Steve Beeby "Microwave-Enabled Wearables: Underpinning Technologies, Integration Platforms, and the Next-Generation Roadmap." *IEEE Journal of Microwaves* (2022).
10. Rahmani, Hamed, Darshan Shetty, Mahmoud Wagih, Leonardo Balocchi, ..., **Dieff Vital**, ..., Jasmin Grosinger "Next-Generation IoT Devices: Sustainable Eco-Friendly Manufacturing, Energy Harvesting, and Wireless Connectivity." *IEEE Journal of Microwaves* (2022): [**Highlighted in the IEEE Technical Activities Spotlight, highlighting the technical core of IEEE for the last quarter (2023)**].

Conference Proceedings

11. **Vital, Dieff**, Shubhendu Bhardwaj, and John L. Volakis. "A 2.45 GHz RF power harvesting system using textile-based single-diode rectennas." In *2019 IEEE MTT-S International Microwave Symposium (IMS)*, pp. 1313-1315. IEEE, 2019. (**Less than 50% acceptance rate**)
12. **Vital, Dieff**, Jingni Zhong, Shubhendu Bhardwaj, and John L. Volakis. "Loss-characterization and guidelines for embroidery of conductive textiles." In *2018 IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting*, pp. 1301-1302. IEEE, 2018.
13. **Vital, Dieff**, Shekhar Bhansali, John L. Volakis, and Shubhendu Bhardwaj. "Electronic wound monitoring using fabric-integrated data modulation." In *2020 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting*, pp. 1351-1352. IEEE, 2020.
14. **Vital, Dieff**, John L. Volakis, and Shubhendu Bhardwaj. "A wireless power transfer system (wpts) using misalignment resilient, on-fabric resonators for wearable applications." In *2020 IEEE/MTT-S International Microwave Symposium (IMS)*, pp. 1184-1187. IEEE, 2020. (**Less than 50% acceptance rate**)
15. **Vital, Dieff**, John L. Volakis, and Shubhendu Bhardwaj. "Textile-based novel anchor-shaped antenna for near-field wireless power transfer." In *2019 International Workshop on Antenna Technology (iWAT)*, pp. 197-198. IEEE, 2019.
16. **Vital, Dieff**, Shubhendu Bhardwaj, and John L. Volakis. "Misalignment resilient, near field wireless power transfer (WPT) antennas using anchor shape." In *2019 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting*, pp. 1795-1796. IEEE, 2019.
17. **Vital, Dieff**, John L. Volakis, and Shubhendu Bhardwaj. "An Ultra-High-Frequency Wirelessly Powered Smart Bandage for Wound Monitoring and Sensing Using Frequency Modulation." In *2021 IEEE MTT-S International Microwave Symposium (IMS)*, pp. 331-334. IEEE, 2021. (**Less than 50% acceptance rate**)

18. Sayeed, Sk Yeahia Been, Daniel Wilding, Jose Solis Camara, **Dieff Vital**, Shubhendu Bhardwaj, and P. M. Raj. "Deformable interconnects with embedded devices in flexible fan-out packages." In *International Symposium on Microelectronics*, vol. 2019, no. 1, pp. 000163-000168. International Microelectronics Assembly and Packaging Society, 2019.
19. Zhong, Jingni, **Dieff Vital**, Shubhendu Bhardwaj, and John L. Volakis. "2.45 GHz wearable RF-harvester for large area textile harvester (LATH) integration." In *2018 IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting*, pp. 2549-2550. IEEE, 2018.
20. **Vital, Dieff**, Shubhendu Bhardwaj, and John L. Volakis. "Bending and twisting tests for rf performances of textile transmission lines." In *2019 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting*, pp. 2173-2174. IEEE, 2019.
21. Mao, Chunxu, Pingjuan L. Werner, Douglas H. Werner, **Dieff Vital**, and Shubhendu Bhardwaj. "Dual-polarized armband embroidered textile antenna for on-/off-body wearable applications." In *2019 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting*, pp. 1555-1556. IEEE, 2019.
22. Bhardwaj, Shubhendu, SK Yeahia Been Sayeed, Jose Solis Camara, **Dieff Vital**, and P. M. Raj. "Reconfigurable mm Wave Flexible Packages with Ultra-thin Fan-Out Embedded Tunable Ceramic IPDs." In *International Symposium on Microelectronics*, vol. 2019, no. 1, pp. 000434-000437. International Microelectronics Assembly and Packaging Society, 2019.
23. **Vital, Dieff**, John L. Volakis, and Shubhendu Bhardwaj. "Textile-Based Corrugated-X Resonators for Wireless RF Power Transfer for Wearable Applications." In *2020 Antenna Measurement Techniques Association Symposium (AMTA)*, pp. 1-2. IEEE, 2020.
24. **Vital, Dieff**, Md Monirojjaman Monshi, Shubhendu Bhardwaj, P. Markondeya Raj, and John L. Volakis. "Flexible Ink-Based Interconnects for Textile-Integrated RF Components." In *2020 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting*, pp. 151-152. IEEE, 2020.
25. **Vital, Dieff**, Alfredo Gonzalez, Elias A. Alwan, John L. Volakis, and Shubhendu Bhardwaj. "A 2.45-GHz Frugal Dumbbell-Shaped Rectenna Built on Recyclable Substrates." In *2020 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting*, pp. 1387-1388. IEEE, 2020.
26. Gaire, Pawan, **Dieff Vital**, Md Rayhan Khan, Cherif Chibane, and Shubhendu Bhardwaj. "Wireless Power Charging of Smartphone up to 6 Feet from Transmitter Antenna at 2.4 GHz." In *2021 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (APS/URSI)*, pp. 19-20. IEEE, 2021.
27. **Vital, Dieff**, John L. Volakis, and Shubhendu Bhardwaj. "A Novel Corrugated-Shank Anchor-Shaped Antenna for Wireless Power Transfer." In *2021 XXXIVth General Assembly and Scientific Symposium of the International Union of Radio Science (URSI GASS)*, pp. 1-2. IEEE.
28. **Vital, Dieff**, "A Novel Clothing-Based Nest-Inspired Resonator for Wireless Power Transfer and Harvesting," *2022 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (AP-S/URSI)*, 2022, pp. 1030-1031,
29. **Vital, Dieff**, "A Novel Fluid-Based Pattern-Reconfigurable, Textile Antenna Array for Wearable Applications," *2022 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (AP-S/URSI)*, 2022, pp. 1028-1029,
30. Islam, Md Khadimul, Khan, Md Rayhan, **Vital, Dieff**, Chibane, Cherif, Hoque, Mahbub, Bhardwaj, Shubhendu "Switched Beam Steering Using Shared Aperture Antenna Array," *2022 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (AP-S/URSI)*, 2022, pp. 617-618.
31. Wagih, Mahmoud, Khan, Md Rayhan, Bhardwaj, Shubhendu, **Vital, Dieff** "Towards Wearable Wireless Power Harvesting using Clothing-Integrated Beamforming Structures," *2022 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (AP-S/URSI)*, 2022, pp. 1032-1033.
32. **Vital, Dieff**, "A Biomimetic Resonator for Fabric-Based Wireless Power Transfer, Harvesting, and Charging of Sensors and Internet of Medical Things," In *2022 IEEE International Conference on RFID Technology and Applications*, pp. 1-4. IEEE, 2022 (Invited and Accepted) (**2nd Place Best Paper Award**)

33. **Vital, Dieff**, "A Textile-Based Wireless Power Transfer System Made of Slot Yagi-Uda Antennas for Wearable and Sensor Applications," in 2023 International Conference on Smart and Sustainable Technologies, pp. 1-5. (*Invited and submitted*)
34. **Vital, Dieff et al.**, "A Charging Nest Made of Novel Dish-Backed Yagi-Uda Antennas for Misalignment Resilient Wireless Power Transfer for Drone Charging," in URSI International Symposium on Electromagnetic Theory 2023 (*Accepted*)
35. **Vital, Dieff**, Bhardwaj, Shubhendu, Smida, Besma "Lab-in-an-Undergarment (LabUnder): A Smart Undergarment for Remote Health Monitoring Using Textile-Based I-Shaped Slot Yagi-Uda Antennas and Data Modulation," in 2023 International Microwave Biomedical Conference. (*Accepted*) [**Young Professionals Special Session**]

Book Chapters

1. **Vital, Dieff**, Bhardwaj, Shubhendu, Volakis, John L. "Wearable RF Harvesting," in *Wearable Antennas and Electronics*, Artech House, 2022
2. Bhardwaj, Shubhendu, **Vital, Dieff**, Volakis, John L. "Wearable Sensors," in *Wearable Antennas and Electronics*, Artech House, 2022
3. Wagih, Mahmoud, **Vital, Dieff**, "Near-and Far-Field RF Power Transfer and Harvesting," in *The Role of 6G and Beyond on the Road to Net-Zero Carbon*, IET, The Institution of Engineering and Technology, 2022

Abstracts Presented/Accepted

1. **Vital, Dieff**, Volakis, John L., Bhardwaj, Shubhendu "On-Textile Coupled Magnetic Resonators for Wireless Power Harvesting Applications," USNC-URSI 2019, Boulder Colorado
2. **Vital, Dieff**, Bhardwaj, Shubhendu, Volakis, John L. "A 2.45 GHz Textile-based RF Rectenna Array for Sensor Applications," USNC-URSI 2019, Boulder Colorado
3. **Vital, Dieff**, Bhardwaj, Shubhendu, Volakis, John L. "Anchor-Shaped Antenna-Based Wireless Charging Platform for Internet of Things," USNC-URSI 2021, Virtual
4. **Vital, Dieff**, "Towards the Development of Novel, Fluidically Pattern-Reconfigurable, Textile-Based Antenna Arrays for 5G/6G-Wearable Applications," Post-Doctoral Research & Career Symposium 2021, November 4-5, 2021, Argonne National Lab
5. Bhardwaj, Shubhendu, **Vital, Dieff**, "Powering IoT Devices Through Misalignment-Resilient Anchor-Shaped Antennas," USNC-URSI 2023, Boulder Colorado (*submitted*)
6. **Vital, Dieff**, Bhushan, Pulak, Gaire, Pawan, Islam, Md Khadimul, Lahade, Shashikant, Pozdin, Vladimir, Volakis, John L., Bhansali, Shekhar, Bhardwaj, Shubhendu, "A Wirelessly Powered Novel Smart Bandage for Chronic Wound Monitoring," USNC-URSI 2023, Boulder Colorado (*submitted*)

Invited Talks

1. **Vital, Dieff**, "Wearable Technology: The Next Revolution in 5G/6G Wireless Communications," Howard University, August 26, 2021.
2. **Vital, Dieff**, "Developing Multifunctional Wearables for 5G/6G Applications," The University of Illinois Chicago ECE Seminar Series, December 3, 2021
3. **Vital, Dieff**, "Wearable Technology: An Application of Electromagnetism," The University of Illinois Chicago, March 04, 2021.
4. **Vital, Dieff**, "Electromagnetics-on-Fabrics: Hubs for Textile-Based Wireless Power Transfer and Harvesting for Wearables," Oklahoma State University, May 3, 2022.
5. **Vital, Dieff**, "Electromagnetics-on-Clothing for Everything: Hubs for Clothing-Based RF Wireless Power Transfer, Harvesting, Sensing, and Monitoring for Internet of Everything," ECE Seminar Series, October 21, 2022.
6. **Vital, Dieff**, "From Contemplating the Dream of Being and Engineer in a Sleepy Little Town in Haiti to Gravitating the Ladder of Professorship at the University of Illinois Chicago: My Unlikely STEM Journey," Argonne National Lab (ACT-SO), November 05, 2022.
7. **Vital, Dieff**, "Novel Wearable Solutions for Smart-Health Monitoring Utilizing Radio Frequency/Microwave Sensing," Cedars-Sinai Computational Biomedicine Grand Rounds, June 14, 2023.

Workshops

1. **Vital, Dieff**, "Smart Wearable Solutions for Health Monitoring Using Fabric-Integrated RF/Microwave Sensing"

- 2023 IEEE IMS Workshop entitled “Microwave/RF sensors for nearfield and long-range sensing applications.”
- 2. **Vital, Dieff**, “Moderator 5G-Integrated IoE: From Design and Manufacturing to Applications” (Discussion Panel) at the IEEE Real Time Communications Conference 2022 (IEEE RTC 2022)
- 3. **Vital, Dieff**, “Moderator, IoT Research Roadmap,” Real-Time Communications Conference Expo at Illinois Tech, October 12, 2021.
- 4. **Vital, Dieff**, “Multifunctional Smart Bandage Using Electrochemical Sensing for Real-Time Monitoring of Chronic Wound Healing.”
 - European Microwave Week 2022 Workshop entitled: “Electromagnetic Waves in Daily Life: Research Insights from Young Professionals.”
- 5. **Vital, Dieff**, “Body-Worn Antennas and RF Circuits for Wireless Power Transmission, Conversion, and Communication for Next Generation Wearable Technology (*short course*)”
 - 2022 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting

Patents (Awarded/Pending)

1. **Vital, Dieff**, Volakis, John L., Bhardwaj, Shubhendu “Power Transfer and Harvesting System Having Anchor-Shaped Antennas (US 16/916,187),”
2. **Vital, Dieff**, Pulak Bhushan, Shekhar Bhansali, Volakis, John L., Bhardwaj, Shubhendu “Smart Bandage for Electrochemical Monitoring and Sensing Using Fabric-Integrated Data Modulation,” (US 17/157,624)
3. **Vital, Dieff**, Volakis, John L., Bhardwaj, Shubhendu “Power Transfer and Harvesting System Having Anchor-Shaped Antennas (US 17/307,321),”
4. **Vital, Dieff**, Erricolo, Danilo “Wireless Power and Bi-Directional Communication Hub and Devices Therefore” (*International Patent filed with USPTO*).
5. **Vital, Dieff**, Smida, Besma, Koyuncu, Erdem, Mambelli, Marco “Advanced Wearable Technology: Intelligent Undergarment for Real-Time health Monitoring and AI-Driven Sensing Network” (*Provisionally filed with USPTO*).
6. **Vital, Dieff**, “Blockchain-Secured AI-Driven Wireless Charging Network for Drones” (*Disclosed to UIC*).

Editorial Peer Review Activities

- **Reviewer**-IEEE Transaction on Antennas and Propagation (2020-present)
- **Reviewer**-IEEE Transaction on Components, Packaging and Manufact. Technology (2021-present)
- **Reviewer**-Applied Energy Elsevier (2021-present)
- **Reviewer**-Scientific Reports (Nature, 2019)
- **Reviewer**-IEEE International Microwave Symposium (2022-present)
- **Reviewer**-Sensors-MDPI (2021-present)
- **Reviewer**-Electronics-MDPI (2021-present)
- **Reviewer**-IEEE Journal of Microwaves (2022-present)
- **Reviewer**-IEEE Microwave Magazine (2022-present)
- **Reviewer**-Textile and Leather Review (2022-present)
- **Reviewer**-Journal of Applied Physics (2022-present)
- **Reviewer**-IEEE Microwave and Wireless Components Letters (2022-present)
- **Reviewer**-IEEE Antennas and Wireless Propagation Letters (2022-present)
- **Reviewer**-IEEE Internet of Things Journal (2022-present)
- **Reviewer**-IEEE Journal of Applied Physics (2022-present)
- **Reviewer**-IEEE Transaction on Biomedical Circuits and Systems (2022-present)
- **Reviewer**-IEEE Transaction on Microwave Theory and Techniques (2023-present)

Services to the Profession and Community

- **Leader**-Team competing for the Civic Tech Challenge at the ThinkChicago Homecoming
- **Panel Moderator**, “IoT Research Roadmap,” IEEE Real-Time Communications Conference & Expo at Illinois Tech, October 12, 2021
- **Member**-IEEE International Microwave Symposium 2022 (IEEE IMS2022) Technical Paper Review Committee-**Subcommittee: 30. Wireless Power Transmission**

- **Member**-IEEE International Microwave Symposium 2023 (IEEE IMS2023) Technical Paper Review Committee-*Subcommittee: 23. Sensing and RFID Systems*
- **Member**-IEEE Antennas and Propagation Society Education Committee
- **Session Chair**: Low-Frequency Wireless Power Transfer and Harvesting at IEEE IMS 2022
- **Session Chair**: Rectenna and Signal Design for RF power Transmission and Energy Harvesting at IEEE IMS 2022
- **Session Chair**: Wearable, Flexible, and Conformable Antennas at IEEE AP-S/URSI 2022
- **Technical program Committee Co-Chair**: IEEE Real-Time Communications Conference 2022
- **Student Paper Competition Judge**: IEEE International Microwave Symposium 2022
- **Instructor**-Short course for the 2022 IEEE APS/USNC-URSI joint conference to be taught in collaboration with Dr. Mahmoud Wagih (University of Southampton, UK)
 - *Course title: Body-Worn Antennas and RF Circuits for Wireless Power Transmission, Conversion, and Communication for Next Generation Wearable Technology*
- **Member**-IEEE APS Best-Paper Awards Committee
- **Member**-IEEE RTC 2023 Technical program Committee
- **Member**-WAMICON 2023 TPC reviewer
- **Member**-Splitech 2023 TPC reviewer
- **Member**-Award committee for IEEE Piergiorgio L. E. Uslenghi Prize Paper (AWPL)
- **Mentor**: UIC ERSP Scholar
 - This initiative involves the mentoring of gifted undergraduate students to conduct research for two consecutive semesters.
- **Mentor**: ACT-SO Student Mentoring program
 - This program is developed at Argonne National lab pairing professors, researchers, and postdoctoral scholars with high school students to perform research for 6 months.
- **Mentor**: GPIP (Guaranteed Paid Internship program) at UIC
 - This initiative involves the mentoring of gifted undergraduate students to conduct research for the summer semester 2022.
- **Judge** GEMS Research Symposium organized by the University of Illinois Chicago-College of Medicine
- Sigma Xi-The Scientific Research Society, FIU Chapter (**2019 Secretary**)
- Toastmasters International (**2020-2021 Treasurer**)
- Florida Polytechnic University-**Presidential Ambassadors**
- IEEE Fox Valley Subsection (under the Chicago Section)-**Chair (2021-2022)**
- Rotaract Club-Florida Polytechnic University (**Founding President**)

In the News...

Vital, Dieff, and Volakis, John L. featured in "E-Textiles for Health Monitoring: Off to a Slow Start, but Coming Soon," (IEEE Pulse) written by Leslie Mertz in June 2020.

Awards

- 2nd Place Winner: 2022 IEEE RFID-TA Best Paper Competition
- Honorable Mention: IMS 2019 3MT® Competition, 2020
- Honorable Mention: IMS 2020 3MT® Competition, 2019
- 3rd place winner: IMS 2019 Student Design Competition, 2019
- IMS 2019/ RFIC2019 PhD Student Sponsorship (Travel Award), 2019
- 2019 USNC-URSI Travel fellowship, 2019
- UIC Postdoctoral Travel Grant, 2022
- UIC Faculty Summer Institute Sponsorship, 2023
- 2022 NSF-NIH Smart and Connected Health Aspiring PI
- Microwave and Technique Initiative Travel Grant (for Young Professionals)
- NSF Student Travel Award, 2018
- 2021 Young Scientist Award (URSI-GASS)
- NSF IEEE RFIC' 20 Student Conference Registration Award, 2020
- FIU Fall 2018 Student Conference Award, 2018
- McKnight Dissertation Year Fellowship (2020-2021)
- 2019 USNC-URSI Travel Fellowship for NRS in Boulder, Colorado
- 2nd place winner: Best Poster-Transforming Antenna workshop on Origami Antennas
- Al Hall Memorial Award, Florida Academy of Sciences

- 2017-Association of Southeastern Biologists (ASB) Support Award for First generation Undergraduate
- 2017-Elizabeth Hayes Travel Award to attend the Florida Academy of Sciences Meeting
- 3rd Place Winner: Mathematics Olympics (2015)
- 1st Place Winner: 2015 State-wide Statistical Analysis Competition (Florida)
- 2nd Place Winner: 2015 State-wide Future Business Educator (Florida)
- 4th Place Winner: 2015 State-wide Macroeconomics (Florida)
- 4th Place Winner: 2015 National level Future Business Educator (USA)

Professional Memberships

- **Associate Member:** IEEE Union Radio-Science Internationale (URSI)-Commission B (academic)
- **Paul Harris Fellow:** Rotary International (leadership)
- **UIC Honors College:** Faculty Fellow

Professional Societies

- IEEE Microwave Theory and Techniques (**Member**)
- IEEE Electronics Packaging Society (**Member**)
- IEEE Engineering in Medicine and Biology Society (**Member**)
- IEEE MTT-TC-26 "RFID, Wireless Sensors and IoT" (**Full Member**)
- IEEE MTT-TC-28 "Biological Effects and Medical Applications" (**Affiliated Member**)