

Charles W. Van Neste

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Tennessee Technological University
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RESEARCH INTERESTS

Wireless and quasi-wireless power transmission and communication, multi-level inverter control and design, renewable power generation, instrumentation, sensing.

EDUCATION

- 08/2007 – 12/2009 Tennessee Technological University/Oak Ridge National Laboratory
Doctor of Philosophy, Electrical Engineering
“The Sound of Light: An Open Environment Photoacoustic Identification of Surface Adsorbed Residues”
Advisor: Thomas Thundat (ORNL) / Satish M. Mahajan (TTU)
- 08/2004 – 05/2006 Tennessee Technological University/Oak Ridge National Laboratory
Master of Science, Electrical Engineering
“A New Method for Collection of Molecular Vapor Using DC Corona Discharge”
Advisor: Thomas Thundat (ORNL) / Satish M. Mahajan (TTU)
- 08/1999 – 05/2004 Tennessee Technological University
Bachelor of Science, Electrical Engineering

TEACHING EXPERIENCE

Eqwmo dæ"rcy "cpf " r tqi tgułpi "vq" c"dcule" kptqf wexkpp lf gtxcvkqp" qh" electromagnetic waves. Course utilized material from Sadiku, Kraus/Carver, Griffiths, and Jefimenko and followed ABET criteria.

ECE 4933 Research Topics ó taught students proper research and developed skills on the following projects:

- 1) wirelessly powered and controlled robotic linkage
- 2) single wire no return communication methodology

ECE 6980 Directed Study ó taught graduate student in the following research topic area

- 1) high frequency inverter topologies related to WPT

Lectures:

Tennessee Tech Uni. Dead-hour Lectures ó gave several lectures to IEEE student chapter detailing research with WPT technology including demonstrations.

University of Cambridge, United Kingdom ó gave invited lecture on my current WPT program at TTU.

Advisement:

Undergraduate advisor for 5 ECE students

Main graduate advisor to 3 Master students and 1 Ph.D. student,

Committee member to 3 Ph.D. students.

01/2011 – 06/2017 Canada Excellence Research Chair Research Associate

Teaching:

ECE 490/491 EE Design Project 1 and 2 ó Equivalent to a Capstone

Invented quasi-wireless transmission technique for the operation of

Funding Awarded to TTU: \$175,000
Duration: 10/01/2018 ó 09/30/2020

Tennessee Valley Authority (TVA)

Lead PI
Total Funding Awarded: \$50,000
Funding Awarded to TTU: \$50,000
Duration: 06/07/2019 ó 09/30/2019

Animus Ventures Pvt Ltd.

Lead PI
Total Funding Awarded: \$12,500

US/Canada Patent Pending
App. No: 62/684,002
Filing Date: 06/12/2018

(UA) **Charles W. Van Neste**, Thomas G. Thundat, John E. Hawk, Richard Hull, Jonathan Backs,
Arindam Phani, Nurichi Guseynov
Electrical Energization and Transmission
US Patent No. **10,622,839**
Filing Date: 11/08/2013

(ORNL) **Charles W. Van Neste**
Multi-winding Homopolar Electric Machine
US Patent No. **8,288,910**
Filing Date: 07/16/2012

(ORNL) **Charles W. Van Neste**, Lawrence R. Senesac, Thomas G. Thundat
Acoustic Enhancement for Photo Detecting Devices
US Patent No. **8,378,286**
Filing Date: 07/16/2010

(ORNL) **Charles W. Van Neste**
Multi-winding Homopolar Electric Machine
US Patent No. **8,247,942**
Filing Date: 06/21/2010

(ORNL) **Charles W. Van Neste**, Marissa E. Morales-Rodriguez, Larry R. Senesac, Thomas G.
Thundat
Standoff Spectroscopy Using a Conditioned Target
US Patent No. **8,080,796**
Filing Date: 6/30/2010

(TTU) **Charles W. Van Neste**, Wenzhong Gao
Wind Aeolipile
US Patent No. **8,591,174**
Filing Date: 11/19/2009

(ORNL) **Charles W. Van Neste**, Arpad Vass, Thomas G. Thundat
External Split Field Generator
US Patent No. **8,120,225**
Date: 06/04/2009

(ORNL) Charles W. Van Neste, Lawrence R. Senesac, Thomas G. Thundat
Reverse Photoacoustic Standoff Spectroscopy
US Patent No. **7,924,423**
Filing Date: 08/11/2008

(ORNL) Charles W. Van Neste, Lawrence R. Senesac, Thomas G. Thundat
Photoacoustic Point Spectroscopy
US Patent No. **7,961,313**
Filing Date: 08/11/2008

REFEREED JOURNAL PUBLICATIONS (underline indicates Students)

Electrical Excitation of the Local Earth for Resonant, Wireless Energy Transfer. Wireless

C.W. Van Neste, L.R. Senesac, D. Yi, T. Thundat, *Standoff detection of explosive residues using photothermal microcantilevers*, Appl. Phys. Letters, Vol. 92, (2008).

A. R. Krause, **C. W. Van Neste**, L. R. Senesac, T. Thundat, and E. Finot, *Trace explosive detection using photothermal deflection spectroscopy*. J. Appl. Phys. **103**, 094906, (2008).

BOOK CHAPTERS

C.W. Van Neste, L.R. Senesac, A.R. Krause, and T. Thundat, *Photothermal Sensing of Chemical Vapors Using Microcantilevers* Nanoscale Science and Technology Applications in Electronics, Photonics, Sensing and Renewable Energy, Edited by A. Korkian (Springer 2010).

CONFERENCE PUBLICATIONS (underline indicates Students)

Charles R. Robinson, Brandon T. Nieman, Robert Craven, Muhammad Enagi Bima, C. W. Van

C. W. Van Neste, Arindam Phani, Richard Hull, J.E. Hawk, Thomas Thundat "Quasi-Wireless Capacitive Energy Transfer for the Dynamic Charging of Personal Mobility Vehicles." IGGG PELS Workshop on Emerging Technology: Wireless Power, Knoxville, TN (2016) (Oral, Article)

C. W. Van Neste, Richard Hull, Tinu Abraham, J.E. Hawk, Arindam Phani, Thomas Thundat, "Wireless Single Contact Power Delivery." IEEE Wireless Pwr. Transfer Conf., Boulder, CO (2015) (Poster, Article)

Inseok Chae, C. W. Van Neste, Thomas Thundat "Ozone alteration for background references using QCL based mid infrared standoff spectroscopy." SPIE Defense, Security, and Sens. Baltimore, MA (2015) (Oral, Article)

Tinu Abraham, Rohan Gaikwad, Aharnish Hande, C. W. Van Neste, J.E. Hawk, Arindam Phani, Artin Afacan, Thomas Thundat "In Situ Heating of Oil Sands Using an Electrical Standing Wave Resonance Excitation Approach." World Heavy Oil Congress, Edmonton, AB (2015)

C.W. Van Neste, X. Liu, M. Gupta, S. Kim, Y. Tsui, and T. Thundat, "Standoff detection of explosive

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