04-May-2023

Dr. Gregory J. Mazzaro
Associate Professor of Electrical Engineering
Department of Electrical & Computer Engineering
The Citadel, The Military College of South Carolina
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Brief Biography

From 2009 to 2013, Dr. Mazzaro worked at the United States Army Research Laboratory (ARL) in Adelphi, MD as an Electronics Engineer. In the Fall of 2013, he joined The Citadel as an Assistant Professor of Electrical Engineering.

While at ARL, Dr. Mazzaro was a member of the Radio-Frequency (RF) Signal Processing and Modeling Branch of the Sensors and Electron Devices Directorate. His primary responsibilities were (a) to design, prototype, and evaluate RF circuits for linear ultra-wideband radar, (b) to design and conduct experiments to exploit the electronic properties of RF devices using nonlinear radar, and (c) to measure and catalogue the electromagnetic properties of soils and energetic materials, in the laboratory as well as in-situ.

Dr. Mazzaro has authored more than 100 publications and is a named inventor on 10 patents. His present research focuses on studying the unintended behaviors of RF electronics illuminated by electromagnetic waves and on developing experimental radars for the remote detection and characterization of those electronics. Dr. Mazzaro performs this research part-time as an Engineering Consultant contracted by Fibertek, Inc. of Herndon, VA.

In 2012, Dr. Mazzaro received a *Research & Development Achievement* award from the U. S. Army for his ring-resonator technique which identifies the dielectric properties of explosive materials and soils. Since 2011, Dr. Mazzaro has served as a technical program committee member and session chairman for the international *SPIE Defense & Commercial Sensing* annual conference. At The Citadel, Dr. Mazzaro is currently the course director for *Electromagnetic Fields*, *Antennas & Propagation*, *Interference Control in Electronics*, *Electrical Laboratory*, and *Electronics Laboratory*.

Education

Ph.D., Electrical Engineering, North Carolina State University, *Raleigh, NC*, 2009

M.S., Electrical Engineering, State University of New York, *Binghamton, NY*, 2006

B.S., Electrical Engineering, Boston University, *Boston, MA*, 2004, *summa cum laude*

Areas of Expertise

Radar: Non-linear and ultra-wideband

Radio-frequency (RF) electronics and systems

Electromagnetic fields and waves

Experience

Associate Professor of Electrical Engineering, The Citadel, *Charleston, SC*, 2018–present
Engineering Consultant, General Technical Services, *Wall Township, NJ*, 2022–present
Engineering Consultant, Fibertek, Inc., *Herndon, VA*, 2019–2022
Assistant Professor of Electrical Engineering, The Citadel, *Charleston, SC*, 2013–2018
Engineering Consultant, General Technical Services, *Wall Township, NJ*, 2014–2019
Electronics Engineer, U.S. Army Research Laboratory, *Adelphi, MD*, 2009–13
Intern, U.S. Army Research Laboratory, *Adelphi, MD*, Summer 2007
Research Assistant, Electronics Research Laboratory, N.C. State Univ., *Raleigh, NC*, 2006–09
Research Scientist, U.S. Air Force Research Laboratory, *Rome, NY*, Summer 2006

Teaching / Involvement with Students / Service to My School

instructor, undergraduate courses (12)

Electronics Laboratory, Electrical & Computer Eng. Dept., The Citadel, 9 semesters
Electromagnetic Fields, Electrical & Computer Eng. Dept., The Citadel, 9 semesters
Electrical Laboratory, Electrical & Computer Eng. Dept., The Citadel, 7 semesters
Antennas & Propagation, Electrical & Computer Eng. Dept., The Citadel, 7 semesters
Interference Control in Electronics, Electrical & Comp. Eng. Dept., The Citadel, 6 semesters
Fundamentals of Electr. Engineering, Elec. & Comp. Eng. Dept., The Citadel, 5 semesters
Electric Circuit Analysis I, Electrical & Computer Eng. Dept., The Citadel, 4 semesters
Principles of Electrical Engineering, Elec. & Comp. Eng. Dept., The Citadel, 4 semesters
Electric Circuit Analysis II, Electrical & Computer Eng. Dept., The Citadel, 3 semesters
Electrical Machinery Lab., Electrical & Computer Eng. Dept., The Citadel, 2 semesters
Communications Engineering, Electrical & Computer Eng. Dept., The Citadel, 1 semester
Electricity & Magnetism, Fundamentals of Eng. Exam review, Oct. '13, Mar. '16, Feb. '18

instructor, graduate courses

Radio-Frequency Systems, Electrical & Computer Eng. Dept., The Citadel, 4 semesters
Electromagnetic Compatibility, Electrical & Computer Eng. Dept., The Citadel, 2 semesters
Digital Communications, Electrical & Computer Eng. Dept., The Citadel, 1 semester

advisor, student projects/research

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2022-23:
R. Fischer, A. Justman, R. Khayat, J. Rasure -- self-healing wireless network via drone
senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2021-22:

J. Dobson-Lewis, B. Marr, D. R. Morgan, A. Nicolas -- GPS-guided rocket

A. P. Research at Academic Magnet High School in North Charleston, SC:
J. B. Benton, "Effect of Medium… on the Generation of a Stable Plasma Arc", Mar. 2022

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2019-20:
R. Arnold, A. Bergeron, C. Smith, V. Voskian, R. Weimar -- drink-pouring robot

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2018-19:
M. Collins, M.Corrigan, A. McKenzie, K. Miller
IEEE SoutheastCon 2019 Student Hardware (Robotics) Competition

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2018-19:
J. Anderson, G. Atwater, A. Shugan, J. Summers -- electronic-scoring cornhole game

undergraduate research, Electrical & Computer Eng. Dept., The Citadel, Spring 2018:
W. J. Widener, "Anechoic Chamber Construction and Characterization…"
winner, Design division, Student Excellence Day Poster Session, The Citadel, Mar. 2018

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2017-18:
R. Callahan, G. DeCecco, N. Henson, J. Sligh, K. Thomas
IEEE SoutheastCon 2018 Student Hardware (Robotics) Competition

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2017-18:
C. Braddock, J. Cunningham, A. Sharpe, T. Phucharoen
IEEE SoutheastCon 2018 Student Hardware (Robotics) Competition

summer undergraduate research internship, U. S. Army Research Laboratory, June 2017:
A. J. Sherbondy, "Detection of… Electronic Radar Targets by Acoustic-EM Waves"
printed in the proceedings of *SPIE Defense & Commercial Sensing 2018* in Orlando, FL
published as a *U. S. Army Research Laboratory Technical Report* in July 2017

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2016-17:
A. Bracey, J. Clark, K. Hamlin, D. Monahan, C. Snider
IEEE SoutheastCon 2017 Student Hardware (Robotics) Competition

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2016-17:
W. Crosby, T. Deese, M. Gill, W. Pauley, C. Smithey -- "Home Security Monitor"

summer undergraduate research internship, U. S. Army Research Laboratory, July 2016:
A. J. Sherbondy, "Linearizing an Intermodulation Radar Transmitter"
printed in the proceedings of *SPIE Defense & Commercial Sensing 2017* in Anaheim, CA
published as a *U. S. Army Research Laboratory Technical Report* in Sept. 2016

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2015-16:
B. Bilbo, G. Evatt, C. Potts, K. Price -- "Port Logistics Robot" autonomous vehicle

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2015-16:
A. Jordan, B. Shelters, S. Cheshire, S. Bell, T. Brown -- "Skyfall" RF signal jammer

summer undergraduate research internship, U. S. Army Research Lab., July-Aug. 2015:
S. F. McGowan, "Phase Responses of Harmonic Radar Targets"
printed in the proceedings of *SPIE Defense & Commercial Sensing 2016* in Baltimore, MD
published as a *U. S. Army Research Laboratory Technical Report* in Oct. 2015

undergraduate research, Electrical & Computer Eng. Dept., The Citadel, Spring 2015:
P. J. Singletary and C. A. Smith, "Half-Wave Parabolic Reflector Antenna Optimization"
participants, Citadel Student Research Conference 2015, The Citadel, Mar. 2015

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2014-15:
R. Schroer, D. Keller, J. Diaz-Jimenez, B. Feals, K. McSwain, D. Walters
IEEE SoutheastCon 2015 Student Hardware (Robotics) Competition

undergraduate research, Electrical & Computer Eng. Dept., The Citadel, Fall 2014:
E. R. Eisenach, "Evaluation of an Ultra-Wideband Diplexer…using Gaussian Pulses"
published in the proceedings of *IEEE SoutheastCon 2015* in Ft. Lauderdale, FL

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2013-14:
M. Straniere, P. L. Su, J. S. Bateman, D. S. Jackson -- "The Fluidic Circuit"

summer doctoral research internship, U. S. Army Research Laboratory, June-July 2013:
K. A. Gallagher, "Linearization of a Harmonic Radar Transmitter by… Filter Reflection"
published in the proceedings of the *2015 IEEE Radar Conference* in Cincinnati, OH

summer doctoral research internship, U. S. Army Research Laboratory, June-Aug. 2012:
J. M. Wetherington, "High Dynamic Range Measurement… using Analog Cancellation"
published as a *U. S. Army Research Laboratory Technical Report* in Oct. 2012

summer doctoral research internship, U. S. Army Research Laboratory, June-Aug. 2010:
J. Hu, "Portable Ring Resonator Permittivity Measurement System"
presented at the *2011 USNC-URSI National Radio Science Meeting* in Boulder, CO

special member, committee, *Doctor of Philosophy in Electrical Engineering*

Alex Bouvy, University of Wisconsin-Madison, graduated Dec. 2022
dissertation: "Compact Antennas for Military Communications… and Radar Applications"

Kyle Gallagher, Pennsylvania State University, graduated Dec. 2015
dissertation: "Harmonic Radar: Theory and Applications…"

faculty advisor, The Citadel Student Branch of the IEEE, 2014-2020

member, committees at The Citadel

college-wide

Undergraduate Curriculum Committee -- 2017-18, 2018-19, 2019-20 (chair), 2021-22
Curriculum & Instruction Committee -- 2015-16, 2016-17
Faculty Awards Committee -- 2014-15, 2015-16
Search Committee, Dean of the School of Engineering -- 2021

Faculty Senate -- 2022-23

School of Engineering -- Probationary Review

Spring 2022: Drs. Integlia, Davila-Montero
Fall 2022: Dr. DeVoria
Spring 2022: Drs. Bierman, DeVoria, Integlia, Ragan, Washuta
Fall 2021: Drs. Elamin, Niksiar, Righter, Vesali
Spring 2020: Drs. Bass, Bierman, Geathers, Integlia, Plumblee, Righter
Fall 2019: Drs. Washuta, Ragan

Department of Electrical & Computer Engineering

Lawton-Ellis Teaching Award Selection Committee -- 2018, 2019, 2020, 2021, 2023

Search Committee, Department Chairman -- Spring 2020: selected Dr. Mark McKinney

Search Committee, New Faculty Members

Spring 2022: hired Dr. Sylmarie Davila-Montero
Spring 2019: hired Dr. Ryan Integlia

Research Activities / Service to the Engineering Discipline

patents awarded (10)

"Method… Passive Transmitter Based Synthetic Aperture Radar" (US patent # 11,131,741)

"Passive Non-Linear Synthetic Aperture Radar…" (US patent # 10,649,080)

"…Detecting Objects using… Radio and Acoustic Signals" (US patent # 10,564,280)

"…Locating Targets Using Non-Linear Radar… Matched Filter…" (US patent # 10,234,543)

"Multitone Radar with Range Determination and Method of Use" (US patent # 10,203,405)

"Automated Cancellation of Harmonics… Feed-Forward…" (US patent # 10,018,707)

"Combined Radar Assembly… Linear and Nonlinear… " (US patent # 9,476,973)

"Method and Apparatus for Cognitive Nonlinear Radar" (US patent # 9,435,882)

"Multitone Harmonic Radar and Method of Use" (US patent # 9,395,434)

"… Meander-Line Ring Resonator" (US patent # 9,151,787)

patents pending

"…Recording the Acoustic-Radar Response of Electronics" (application # 17/321,557)

"Multi-Mode Nonlinear Junction Detector"

conference chairman

SPIE Defense & Commercial Sensing

Radar Sensor Technology XXVII, Orlando, FL, May 2023 (8 sessions, 30 papers)

session chairman / moderator

ASEE Southeastern Section Conference

"Electrical/Software/Computer Engineering division," Charleston, SC, Mar. 2022

IEEE SoutheastCon

"Sensors and Measurements Systems -- Track 7," online, Mar. 2021

SPIE Defense & Commercial Sensing

"Waveforms and Phenomenology," Radar Sens. Tech. XXVI, Orlando, FL, Apr. 2022

"Non-Linear Radar and Arbitrary Waveforms," Radar Sens. Tech. XXV, online, Apr. 2021

"System Development," Radar Sensor Tech. XXIII conference, Baltimore, MD, Apr. 2019

"Algorithms and Processing I," Radar Sensor Tech. XXII conf., Orlando, FL, Apr. 2018

"Components and Technology," Radar Sensor Tech. XXI conf., Anaheim, CA, Apr. 2017

"Indoor and Urban Imaging," Radar Sensor Tech. XXI conf., Anaheim, CA, Apr. 2017

"Programs and Systems," Radar Sensor Tech. XX conference, Baltimore, MD, Apr. 2016

ASEE Annual Conference & Exposition

"Electromagnetics & Power Education," New Orleans, LA, June 2016

SPIE Defense, Security, & Sensing

"Nonlinear Radar," Radar Sensor Technology XIX conference, Baltimore, MD, May 2015

"Programs & Systems," Radar Sensor Tech. XVIII conference, Baltimore, MD, May 2014

"Phenomenology," Radar Sensor Technology XVI conference, Baltimore, MD, Apr. 2012

"Through-the-Wall Sensing," Radar Sensor Tech. XVI conf., Baltimore, MD, Apr. 2012

"Through-the-Wall Radar," Radar Sensor Tech. XV conference, Orlando, FL, Apr. 2011

"Phenomenology," Radar Sensor Technology XV conference, Orlando, FL, Apr. 2011

<u>technical program committee member</u>

AP-S/URSI Int. Symposium & Radio Science Meeting, Portland, OR, July 2023

ASEE Southeastern Section Conference, Fairfax, VA, Mar. 2023

IEEE Radar Conference, New York, NY, Mar. 2022

IEEE Radar Conference, online, Apr. 2021

SPIE Defense & Commercial Sensing, online, Apr. 2021

IEEE SoutheastCon, online, Mar. 2021

IEEE International Radar Conference, online, Apr. 2020

SPIE Defense & Commercial Sensing, online, Apr. 2020

IEEE SoutheastCon, Raleigh, NC, Mar. 2020

IEEE Radar Conference, Boston, MA, Apr. 2019

IEEE SoutheastCon, Huntsville, AL, Apr. 2019

SPIE Defense & Commercial Sensing, Baltimore, MD, Apr. 2019

IEEE Radar Conference, Oklahoma City, OK, Apr. 2018

IEEE SoutheastCon, St. Petersburg, FL, Apr. 2018

SPIE Defense & Commercial Sensing, Orlando, FL, Apr. 2018

SPIE Defense & Commercial Sensing, Anaheim, CA, Apr. 2017

SPIE Defense & Commercial Sensing, Baltimore, MD, Apr. 2016

IEEE SoutheastCon, Norfolk, VA, Mar. 2016

SPIE Defense, Security, & Sensing, Baltimore, MD, Apr. 2015

SPIE Defense, Security, & Sensing, Baltimore, MD, May 2014

IEEE SoutheastCon, Nashville, TN, Mar. 2011

IEEE SoutheastCon, Charlotte, NC, Mar. 2010

peer reviewer, technical publications

IEEE Transactions on Aerospace & Electronic Systems -- May 2021, Aug. 2021, Dec. 2022

IEEE Transactions on Geoscience & Remote Sensing -- June 2017, Sept. 2022, Dec. 2022

IEEE Transactions on Microwave Theory & Techniques -- Aug. 2021, Jan. 2022

MDPI Remote Sensing journal -- Nov. 2021

IEEE Transactions on Instrumentation and Measurement -- Oct. 2021

IEEE Microwave and Wireless Components Letters -- June/Aug. 2013, Dec. 2019, July 2021

IEEE Transactions on Signal Processing -- June 2021

MDPI Electronics journal -- Feb. 2021

MDPI Applied Sciences journal -- July 2018, July 2020

IEEE Wireless Communications Magazine -- June 2020

MDPI Data journal -- May 2020

MDPI Sensors journal -- June 2016, Aug. 2016, Dec. 2017, Mar. 2018, Apr. 2020

EuMA Internat. J. of Microwave & Wireless Techn. -- Dec. 2016, Mar. 2017, Dec. 2019

IEEE Sensors Letters -- Feb./Mar./May/Dec. 2017, June 2018, Mar. 2019, Sept. 2019

IEEE J. of Selected Topics in Applied Earth Observations & Remote Sensing -- Oct. 2017

Ecology and Evolution -- Mar. 2017

IEEE Signal Processing Letters -- Feb. 2017

AEU International Journal of Electronics and Communications -- Oct. 2016

IEEE Sensors journal -- Dec. 2013

editor, special session

MDPI Remote Sensing journal -- "Nonlinear Junction Detection and Harmonic Radar", 2022

Other Participations

reviewer, proposals

Dutch Research Council (NWO) *Applied & Engineering Sciences* grant -- Nov. 2021

Army Research Office grants -- Apr. 2015, Jan. 2020, Apr. 2022

John Wiley & Sons, Inc. new textbooks -- Dec. 2015, Feb. 2016

member

Institute of Electrical & Electronics Engineers (IEEE)

Senior Member, 2015-present // Member, 2009-2015 // Student Member, 2004-2009

Phi Kappa Phi honor society, 2021-present

Sigma Xi honor society, 2021-present

Tau Beta Pi (TBP) honor society, 2015-present

Standoff Inverse Analysis & Manipulation of Elec. Sys. (SIAMES) group, NCSU, 2006-09

certifications

IPC Specialist J-STD-001 (Requirements for Soldered… Assemblies), # J001-S 18024968

Engineer-in-Training -- passed Fundamentals of Engineering exam, Boston, MA, Apr. 2004

attendee & graduate

Online Teaching Faculty Academy, The Citadel, Spring 2016

Mini-ExCEEd Teaching Workshop, The Citadel, Charleston, SC, Jan. 2014

NATO Adv. Studies Inst., "Unexploded Ordnance Detection…," Il Ciocco, Italy, July 2008

facilitator

South Carolina Science Olympiad -- The Citadel, Charleston, SC, Apr. 2023

"WiFi Lab" event -- written exam and prototype-antenna wireless-connection test

Innovation, Design, & Educational Activities in STEM camps

sponsored by NIWC Atlantic -- 2 camps -- June-July 2022

STEM Tent at the Charleston Air Expo

table to advertise the Citadel Dept. of Electrical & Computer Engineering -- Apr. 2022

Citadel Leadership Day

Sophomore Service Project, FIRST Lego League -- Oct. 2014, 15, 16, 17, 19, 21
Senior Leadership Integration Seminar, SCANA/SCE&G -- Oct. 2013

Richland County District 2 ALERT

6 visits to the Electrical & Computer Engineering Department -- Fall 2014, 2016, 2022

Citadel Pre-Knob ("Inside-the-Gates") Orientations

Dept. of Elec. & Comp. Eng. -- 2013-20, 2021-23

Recognition / Honors

local news / media

Citadel Today, article published 1-Nov-2021

"Citadel professor earns 10th patent on inventions to protect American soldiers"

Citadel Today, article published 15-Mar-2021

"Engineering professor… collaboration between The Citadel and Army Research Lab"

Citadel Today, article published 28-Jun-2019

"Mazzaro continuing project at Army Research Lab to help soldiers detect hidden devices"

Citadel Today, article published 17-Mar-2017

"Engineering professor invents potentially lifesaving military technology"

Post & Courier, article by Thad Moore, published 12-Mar-2017

"It's on his radar: Charleston professor sees new use for detection technology"

award winner

Lawton & Ellis Teaching Award, Elec. & Comp. Eng. Dept., The Citadel -- 2017, 2022

Faculty Excellence in Research, The Citadel, 2017

U. S. Army Research & Development Achievement, 2012

"Ring-Resonator Technique for Identification of Dielectric Properties of IED Charges…"

Publications (111)

Journal Articles (14)

A. Bouvy, G. Mazzaro, K. Gallagher, K. Sherbondy, and N. Behdad, "A Dual-Band Patch Antenna Employing a Folded Probe Feed for Nonlinear Radar Applications," *IEEE Transactions on Antennas & Propagation*, Vol. 71, No. 3, Mar. 2023, pp. 2070-2081.

G. J. Mazzaro, "Detection of Radio-Frequency Electronics by Stimulated Emission of Carrier Modulation," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 58, No. 2, pp. 1021-1028, Apr. 2022.

A. Bouvy, G. Mazzaro, K. Gallagher, K. Sherbondy, and N. Behdad, "A Dual-Band Patch Antenna Employing a Folded Probe Feed for Nonlinear Radar Applications," submitted to *IEEE Transactions on Antennas & Propagation*, Feb. 2022.

B. Perez, G. Mazzaro, T. Pierson, and D. Kotz, "Detecting the Presence of Electronic Devices in Smart Homes Using Harmonic Radar Technology," *MDPI Remote Sensing* special issue, "Nonlinear Junction Detection and Harmonic Radar," Jan. 2022.

R. M. Narayanan, K. A. Gallagher, G. J. Mazzaro, A. F. Martone, and K. D. Sherbondy, "Hardware Design of a High Dynamic Range Radio Frequency Harmonic Measurement System," *MDPI Instruments*, Vol. 2, No. 3, 16 pages, 2018.

G. J. Mazzaro, A. F. Martone, K. I. Ranney, and R. M. Narayanan, "Nonlinear Radar for Finding RF Electronics: System Design and Recent Advancements," *IEEE Transactions on Microwave Theory & Techniques*, Vol. 65, No. 5, pp. 1716-1726, May 2017.

K. A. Gallagher, R. M. Narayanan, G. J. Mazzaro, A. F. Martone, and K. D. Sherbondy, "Static and Moving Target Imaging using Harmonic Radar," *MDPI Electronics*, Vol. 6, No. 2, 30 pages, Apr. 2017.

A. F. Martone, K. A. Gallagher, K. D. Sherbondy, K. I. Ranney, T. V. Dogaru, G. J. Mazzaro, and R. M. Narayanan, "Adaptable Bandwidth for Harmonic Step-Frequency Radar," *International Journal of Antennas and Propagation*, Vol. 2015, Article 808093, 15 pages, July 2015.

G. J. Mazzaro, A. F. Martone, and D. M. McNamara, "Detection of RF Electronics by Multitone Harmonic Radar," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 50, No. 1, pp. 477-490, Jan. 2014.

G. J. Mazzaro, M. B. Steer, and K. G. Gard, "Intermodulation Distortion in Narrowband Amplifier Circuits," *IET Microwaves, Antennas, & Propagation*, Vol. 4, No. 9, pp. 1149-1156, Sept. 2010.

G. J. Mazzaro, K. G. Gard, and M. B. Steer, "Linear Amplification by Time-Multiplexed Spectrum," *IET Circuits, Devices, & Systems*, Vol. 4, No. 5, pp. 392-402, Sept. 2010.

C. S. Saunders, G. J. Mazzaro, and M. B. Steer, "Robust Reduced-Order Modeling of Distributed Linear Networks," *IET Microwaves, Antennas, & Propagation*, Vol. 4, No. 7, pp. 962-973, July 2010.

G. J. Mazzaro, M. B. Steer, and K. G. Gard, "Filter Characterization Using One-Port Pulsed RF Measurements," *IET Microwaves, Antennas, & Propagation*, Vol. 3, No. 2, pp. 303-309, Mar. 2009.

G. J. Mazzaro, M. B. Steer, K. G. Gard, and A. L. Walker, "Response of RF Networks to Transient Waveforms: Interference in Frequency-Hopped Communications," *IEEE Transactions on Microwave Theory & Techniques*, Vol. 56, No. 12, pp. 2808-2814, Dec. 2008.

<u>Conference Proceedings</u> (64)

G. J. Mazzaro, K. L. Skenes, and T. A. Wood, "A Review of Multi-Disciplinary Introduction-to-Engineering Courses and Unified-First-Year Engineering Programs," presented at the *ASEE Southeastern Section Conference*, Fairfax, VA, Mar. 2023.

G. Mazzaro, K. Gallagher, K. Sherbondy, B. Perez, D. Kotz, and T. Pierson, "Harmonic Response vs. Target Orientation: A Preliminary Study of the Effect of Polarization on Nonlinear Junction Detection," *Proceedings of the SPIE*, Vol. 12108, pp. 1210803(1-21), May 2022.

G. J. Mazzaro, “Homemade-Antenna Project for an Undergraduate Wave-Propagation Course,” presented at the *ASEE Southeast Annual Conference*, Charleston, SC, Mar. 2022.

A. Bouvy, N. Behdad, G. Mazzaro, K. Gallagher, and K. Sherbondy, “A Dual-Band Patch Antenna Employing a Folded Probe Feed for Non-Linear Radar Applications,” presented at the *2022 URSI National Radio Science Meeting*, Boulder, CO, Jan. 2022.

A. Bouvy, N. Behdad, G. Mazzaro, K. Gallagher, and K. Sherbondy, “Antenna Design for Improved Non-Linear Radar Performance,” presented at the *2021 IEEE International Symposium on Antennas & Propagation and USNC-URSI Radio Science Meeting*, Marina Bay Sands, Singapore, Dec. 2021.

G. Mazzaro, K. Gallagher, D. Harvey, K. Salik, and K. Sherbondy, “Stimulating Carrier Modulation from Electronics using a Transverse Electromagnetic Cell,” *Proceedings of the SPIE*, Vol. 11742, pp. 117420J(1-9), Apr. 2021.

G. Mazzaro, K. Gallagher, K. Sherbondy, and K. Salik, “Detecting Nonlinear Junctions using Harmonic Cross-Modulation,” presented at *IEEE SoutheastCon 2021*.

G. J. Mazzaro, K. A. Gallagher, K. D. Sherbondy, and A. F. Martone, “Nonlinear Radar: A Historical Overview and a Summary of Recent Advancements,” *Proceedings of the SPIE*, Vol. 11408, pp. 114080E(1-16), May 2020.

G. J. Mazzaro, “Nonlinear Junction Detection vs. Electronics: System Design and Improved Linearity,” presented at the *IEEE 2020 International Radar Conference*, Washington, DC, Apr. 2020.

G. J. Mazzaro, B. H. Knapp, K. D. Sherbondy, and K. A. Gallagher, “Benchtop Assembly for Measuring Acoustic-Radar Responses of Electronic Targets,” *Proceedings of IEEE SoutheastCon*, Raleigh, NC, Mar. 2020.

R. Barsanti, G. Mazzaro, and J. Skinner, “Enhancing an Electrical Engineering Communication Course with an FM Demodulator Project,” *Transactions on Techniques in STEM Education*, pp. 2-7, Oct.-Dec. 2019.

G. J. Mazzaro, K. A. Gallagher, and K. D. Sherbondy, “Detection of Passive-Infrared-Triggered RF Devices by UHF Harmonic Radar: Concealed Targets & Polarization Study,” *Proceedings of the 65th Annual Meeting of the MSS Tri-Service Radar Symposium*, June 2019.

G. J. Mazzaro and K. D. Sherbondy, “Harmonic Nonlinear Radar: From Benchtop Experimentation to Short-Range Wireless Data Collection,” *Proceedings of the SPIE*, Vol. 11003, pp. 110030F(1-11), May 2019.

G. J. Mazzaro, “Filter Selection for Wideband Harmonic Radar,” *Proceedings of IEEE SoutheastCon*, Huntsville, AL, Apr. 2019.

R. Barsanti, R. Hayne, and G. Mazzaro, “Hands-On Learning: A Four-Year Laboratory Sequence for Electrical Engineering Students,” presented at the *2019 ASEE Southeast Section Annual Conference*, Raleigh, NC, Mar. 2019.

G. J. Mazzaro, K. A. Gallagher, and K. D. Sherbondy, "Detection of Explosively Formed Penetrators by Acoustic Radar," presented at *MSS Battlespace Acoustic and Seismic Sensing, Magnetic & Electric Field Sensors*, Gaithersburg, MD, Oct. 2018.

G. J. Mazzaro, "Hardware Simulation of Harmonic Radar using a Transverse Electromagnetic Cell," *Proceedings of IEEE SoutheastCon*, St. Petersburg, FL, Apr. 2018.

G. J. Mazzaro, A. J. Sherbondy, M. R. Judy, K. A. Gallagher, and K. D. Sherbondy, "Detection of Radio-Frequency Electronics by Acoustic Modulation of Radar Waves," *Proceedings of the SPIE*, Vol. 10633, pp. 106330V(1-13), May 2018.

K. Ranney, K. Gallagher, G. Mazzaro, and S. Freeman, "A Passive, Synthetic Aperture Device Imager," presented at *MSS Battlespace Acoustic and Seismic Sensing, Magnetic & Electric Field Sensors*, Springfield, VA, Oct. 2017.

G. J. Mazzaro, A. J. Sherbondy, K. I. Ranney, K. D. Sherbondy, and A. F. Martone, "Linearizing an Intermodulation Radar Transmitter by Filtering Switched Tones," *Proceedings of the SPIE*, Vol. 10188, pp. 101881A(1-16), May 2017.

K. A. Gallagher, G. J. Mazzaro, A. F. Martone, K. D. Sherbondy, and R. M. Narayanan, "Recent Non-Linear Radar Research at the Army Research Laboratory," *Proceedings of the SPIE*, Vol. 10188, pp. 101881B(1-9), May 2017.

G. J. Mazzaro and R. J. Hayne, "Instructional Demos, In-Class Projects, and Hands-On Homework: Active Learning for Electrical Engineering using the Analog Discovery," presented at the *2016 ASEE Annual Conference & Exposition*, New Orleans, LA, June 2016.

A. F. Martone, K. I. Ranney, K. D. Sherbondy, K. A. Gallagher, G. J. Mazzaro, and R. M. Narayanan, "An Overview of Spectrum Sensing for Harmonic Radar," presented at the *IEEE International Symposium on Fundamentals of Electrical Engineering*, Bucharest, Romania, June 2016.

G. J. Mazzaro, S. F. McGowan, K. G. Gallagher, K. D. Sherbondy, A. F. Martone, and R. M. Narayanan, "Phase Responses of Harmonics Reflected from Radio-Frequency Electronics," *Proceedings of the SPIE*, Vol. 9829, pp. 98290O(1-14), Apr. 2016.

K. G. Gallagher, G. J. Mazzaro, A. F. Martone, K. D. Sherbondy, and R. M. Narayanan, "Derivation and Validation of the Nonlinear Radar Range Equation," *Proceedings of the SPIE*, Vol. 9829, pp. 98290P(1-13), Apr. 2016.

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G. J. Mazzaro, "Nonlinear Radar for Locating & Identifying Radio Frequency Electronics," *45-minute seminar*, Department of Electrical & Computer Engineering, University of Alabama, Tuscaloosa, AL, Apr. 2023.

G. J. Mazzaro, K. D. Sherbondy, and K. A. Gallagher, "Detection of Passive-Infrared-Triggered Devices by Nonlinear Radar," *45-minute seminar*, U.S. Army Research Laboratory, Adelphi, MD, June 2018.

G. J. Mazzaro, A. J. Sherbondy, K. A. Gallagher, and K. D. Sherbondy, "Hybrid Acoustic-Electromagnetic Radar for Finding and Identifying Electronic Devices," seminar provided to the *Charleston Chapter of Sigma Xi* at The Citadel, Charleston, SC, Apr. 2018.

G. J. Mazzaro, A. J. Sherbondy, K. A. Gallagher, M. R. Judy, and K. D. Sherbondy, "Nonlinear Radar & Acousto-RF Effects," *45-minute seminar*, U.S. Army Research Laboratory, Adelphi, MD, Aug. 2017.

G. J. Mazzaro, A. F. Martone, K. A. Gallagher, and R. M. Narayanan, "Nonlinear Radar for Remotely Finding and Identifying Handheld Electronics," seminar provided to the *Citadel Student Branch of the IEEE*, Charleston, SC, Apr. 2017.

G. J. Mazzaro, A. F. Martone, and K. A. Gallagher, "Nonlinear Radar for Remotely Locating and Identifying Electronic Devices," seminar provided to the *Charleston Chapter of Sigma Xi* at The Citadel, Charleston, SC, Apr. 2015.

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