

Dr. Gregory J. Mazzaro

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 faculty of the Department of Electrical & Computer Engineering at The Citadel. In the Spring of 2024, he was promoted to the rank of Professor.

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 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.

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 I*, and *Electrical Laboratory II*.

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

Professor of Electrical Engineering, The Citadel, *Charleston, SC*, 2024–present
Engineering Consultant, Defense Engineering Services, *Ladson, SC*, 2024–present
Associate Professor of Electrical Engineering, The Citadel, *Charleston, SC*, 2018–2024
Engineering Consultant, General Technical Services, *Wall Township, NJ*, 2022–2024
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

Electromagnetic Fields, Electrical & Computer Eng. Dept., The Citadel, 10 semesters
Electrical Laboratory II, Electrical & Computer Eng. Dept., The Citadel, 9 semesters
Electrical Laboratory I, Electrical & Computer Eng. Dept., The Citadel, 8 semesters
Antennas & Propagation, Electrical & Computer Eng. Dept., The Citadel, 8 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, 5 semesters
Principles of Electrical Engineering, Elec. & Comp. Eng. Dept., The Citadel, 4 semesters
Electric Circuit Analysis II, Electrical & Computer Eng. Dept., The Citadel, 4 semesters
Electrical Laboratory III, Electrical & Computer Eng. Dept., The Citadel, 2 semesters
Communications Engineering, Electrical & Computer Eng. Dept., The Citadel, 2 semesters
Signals & Systems, Electrical & Computer Eng. Dept., The Citadel, 1 semester
Introduction to Engineering, School of Engineering, 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, 5 semesters
Electromagnetic Compatibility, Electrical & Computer Eng. Dept., The Citadel, 2 semesters

Digital Communications, Electrical & Computer Eng. Dept., The Citadel, 2 semesters
advisor, student projects/research

senior design capstone project, Electrical & Computer Eng. Dept., The Citadel, 2023-24:
 J. Aiken, D. Calhoun, R. Huckaby, F. Vogel -- lightning detection and mapping system

graduate independent study, Electrical & Computer Eng. Dept., The Citadel, 2023-24:
 J. Rasure, “Adjustable-Back-Short Waveguide-to-Coaxial Adapter” (Spring 2024),
 “Millimeter-Wave Pyramidal Horn Antenna Design” (Fall 2023)

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

advanced-placement research, Academic Magnet High School, North Charleston, SC:
 J. B. Benton, “Effect of Medium... on the Generation of a Stable Plasma Arc”, Mar. 2022

summer doctoral research internship, U. S. Army Research Laboratory, May-June 2021:
 A. Bouvy, “A Dual-Band Patch Antenna... for Nonlinear Radar Applications”
 published in the proceedings of the *2022 USNC-URSI National Radio Science Meeting*

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 and 2023-24
member, committees at The Citadel

college-wide

Undergraduate Curriculum Committee -- 2017-18, 2018-19, 2019-20 (chair), 2021-24
Faculty Senate -- 2022-24
Faculty Innovative Instructional Technology Mini-Grant Reviews -- Fall 2023
Search Committee, Dean of the School of Engineering -- 2021
Curriculum & Instruction Committee -- 2015-16, 2016-17
Faculty Awards Committee -- 2014-15, 2015-16

School of Engineering -- Probationary Review

Spring 2024: Dr. Bolborici, Dr. Dávila-Montero
Spring 2023: Dr. Integlia
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, Plumlee, Righter
Fall 2019: Drs. Washuta, Ragan

Department of Electrical & Computer Engineering

Lawton-Ellis Teaching Award Selection Committee -- 2018–21, 2023–24
Scholarship Selection Committee -- 2014–20, 2021–24 (chairman)
Search Committee, Department Chairman -- Spring 2020: selected Dr. Mark McKinney
Search Committee, New Faculty Members
Fall 2024: hired Dr. Shobhit Aggarwal
Spring 2023: hired Dr. Valentin Bolborici
Spring 2022: hired Dr. Sylmarie Dávila-Montero
Summer 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

“Harmonic Radar Scanner for Electronics” (provisional application filed 2023-06-21)
“Multi-Mode Nonlinear Junction Detector”

conference chairman

SPIE Defense & Commercial Sensing

2024 -- Radar Sensor Technology XXVIII, National Harbor, MD (10 sessions, 39 papers)

2023 -- Radar Sensor Technology XXVII, Orlando, FL (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

“Applications and Exploitation Techniques I,” RST XXVIII, National Harbor, MD, 2024

“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

technical program committee member / paper reviewer

ASEE Southeastern Section Conference, Marietta, GA, Mar. 2024

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

ScienceDirect Digital Signal Processing -- Mar. 2024

SPIE Journal of Applied Remote Sensing -- Nov. 2023

IEEE Trans. on Aerosp. & Electr. Systems -- May 2021, Aug. 2021, Dec. 2022, Sept. 2023

IEEE Aerospace & Electronic Systems Magazine -- July 2023
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

Professional Engineer -- registered in South Carolina, license # 42043, Nov. 2023

passed Principles & Practice of Engineering exam, North Charleston, SC, Oct. 2023

passed Fundamentals of Engineering exam, Boston, MA, Apr. 2004

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

attendee

“Course Modalities,” Center for Excellence and Innovation in Teaching, Learning and Distance Education -- The Citadel, Oct. 2023

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

volunteer / departmental representative

South Carolina Science Olympiad -- The Citadel, Charleston, SC

2024 -- “Wind Power” event -- written exam and fan-blade electricity-generation test

2023 -- “WiFi Lab” event -- written exam and prototype-antenna wireless-connection test

chaperone, Ethics-in-Engineering Case Competition, Bethesda, MD

sponsored by The Lockheed Martin Corporation -- 2 trips -- Feb. 2023 and 2024

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

Senior Leadership Integration Seminar, Santee Cooper -- Oct. 2023

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, 2021-24

Recognition / Honors

local news / media

Post & Courier, article by John Ramsey, published 6-July-2023

“At The Citadel, research finds new way to see buried bombs”

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 (116)

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.

Conference Proceedings (69)

G. J. Mazzaro, K. L. Skenes, and T. A. Wood, "Growth of Student Awareness Within a Discipline-Agnostic Introduction-to-Engineering Course," accepted to the *ASEE Annual Conference & Exposition*, Portland, OR, June 2024.

G. J. Mazzaro, K. L. Skenes, and T. A. Wood, "Mini-Laboratory Activities to Reinforce Counter-Intuitive Principles in a Senior-Undergraduate Course on Electromagnetic Compatibility," presented at the *ASEE Southeastern Section Conference*, Kennesaw, GA, Mar. 2024.

T. A. Wood, K. L. Skenes, and G. J. Mazzaro, "The Eclectic Reader for Introduction to Engineering," presented at the *ASEE Southeastern Section Conference*, Kennesaw, GA, Mar. 2024.

B. Perez, C. Martinez, T. Pierson, G. Mazzaro, and D. Kotz, "Evaluating the Practical Range of Harmonic Radar to Detect Smart Electronics," presented at the *IEEE Military Communications Conference*, Boston, MA, Nov. 2023.

B. Perez, T. Pierson, G. Mazzaro, and D. Kotz, "Identification and Classification of Electronic Devices Using Harmonic Radar," presented at the *IEEE International Conference on Distributed Computing in Smart Systems and the Internet of Things*, Coral Bay, Cyprus, June 2023.

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.

- K. I. Ranney, G. J. Mazzaro, K. G. Gallagher, A. F. Martone, K. D. Sherbondy, and R. M. Narayanan, "Instantaneous, Stepped-Frequency, Non-Linear Radar Part 2: Experimental Confirmation," *Proceedings of the SPIE*, Vol. 9829, pp. 98291P(1-6), Apr. 2016.
- G. J. Mazzaro, A. F. Martone, K. A. Gallagher, R. M. Narayanan, and K. D. Sherbondy, "Maximizing Harmonic-Radar Target Response: Duty Cycle vs. Peak Power," *Proceedings of IEEE SoutheastCon 2016*, Norfolk, VA, Mar. 2016.
- K. A. Gallagher, R. M. Narayanan, G. J. Mazzaro, K. I. Ranney, A. F. Martone, and K. D. Sherbondy, "Moving Target Indication with Non-Linear Radar," *Proceedings of the IEEE Radar Conference*, pp. 1428-1433, May 2015.
- G. J. Mazzaro, K. A. Gallagher, A. F. Martone, K. D. Sherbondy, and R. M. Narayanan, "Short-Range Harmonic Radar: Chirp Waveform, Electronic Targets," *Proceedings of the SPIE*, Vol. 9461, pp. 946108(1-12), Apr. 2015.
- K. A. Gallagher, G. J. Mazzaro, A. F. Martone, K. D. Sherbondy, and R. M. Narayanan, "Filter Selection for a Harmonic Radar," *Proceedings of the SPIE*, Vol. 9461, pp. 94610A(1-11), Apr. 2015.
- K. A. Gallagher, G. J. Mazzaro, K. I. Ranney, Lam H. Nguyen, K. D. Sherbondy, and R. M. Narayanan, "Nonlinear Synthetic Aperture Radar Imaging Using a Harmonic Radar," *Proceedings of the SPIE*, Vol. 9461, pp. 946109(1-11), Apr. 2015.
- K. I. Ranney, K. A. Gallagher, K. D. Sherbondy, A. F. Martone, G. J. Mazzaro, and R. M. Narayanan, "Instantaneous, Stepped-Frequency, Nonlinear Radar," *Proceedings of the SPIE*, Vol. 9461, pp. 946122(1-8), Apr. 2015.
- E. R. Eisenach and G. J. Mazzaro, "Evaluation of an Ultra-Wideband Diplexer for Simultaneous UHF and X-Band Operation using Modulated Gaussian Pulses," *Proceedings of IEEE SoutheastCon 2015*, Ft. Lauderdale, FL, Apr. 2015.
- G. J. Mazzaro, K. A. Gallagher, A. F. Martone, and R. M. Narayanan, "Stepped-Frequency Nonlinear Radar Simulation," *Proceedings of the SPIE*, Vol. 9077, pp. 90770U(1-10), May 2014.
- K. A. Gallagher, G. J. Mazzaro, K. D. Sherbondy, R. M. Narayanan, and A. F. Martone, "Automated Cancellation of Harmonics using Feed-Forward Filter Reflection for Radar Transmitter Linearization," *Proceedings of the SPIE*, Vol. 9077, pp. 907703(1-10), May 2014.
- A. Martone, K. I. Ranney, G. J. Mazzaro, and D. M. McNamara, "Spectrum Sensing Techniques for Nonlinear Radar," *Proceedings of the SPIE*, Vol. 9077, pp. 90770D(1-11), May 2014.
- K. A. Gallagher, R. M. Narayanan, G. J. Mazzaro, and K. D. Sherbondy, "Linearization of a Harmonic Radar Transmitter by Feed-Forward Filter Reflection," *Proceedings of the IEEE Radar Conference*, pp. 1363-1368, May 2014.
- G. J. Mazzaro, A. F. Martone, and M. B. Higgins, "RF Device Detection using Nonlinear Radar," *Proceedings of the 59th Annual Meeting of the MSS Tri-Service Radar Symposium*, June 2013.

- G. J. Mazzaro and A. F. Martone, "Multitone Harmonic Radar," *Proceedings of the SPIE*, Vol. 8714, pp. 87140E(1-7), May 2013.
- A. F. Martone, K. Ranney, A. Hedden, D. McNamara, and G. Mazzaro, "Cognitive Processing for Nonlinear Radar," *Proceedings of the SPIE*, Vol. 8714, pp. 87140H(1-10), May 2013.
- B. R. Phelan, M. A. Ressler, G. J. Mazzaro, K. D. Sherbondy, and R. M. Narayanan, "Design of Spectrally Versatile Forward-Looking Ground-Penetrating Radar for Detection of Concealed Targets," *Proceedings of the SPIE*, Vol. 8714, pp. 87140B(1-10), May 2013.
- G. Mazzaro, A. Martone, D. McNamara, and M. Higgins, "Nonlinear Radar Responses of RF Devices to Continuous Waves and Switched Tones," *58th Annual Meeting of the MSS Tri-Service Radar Symposium*, Boulder, CO, June 2012.
- A. Martone, G. Mazzaro, D. McNamara, and M. Higgins, "Intermodulation Distortion Signatures for Nonlinear Radar," *58th Annual Meeting of the MSS Tri-Service Radar Symposium*, Boulder, CO, June 2012.
- K. Ranney, D. Liao, K. Sherbondy, L. Nguyen, G. Kirose, F. Koenig, G. Mazzaro, G. Smith, and K. Kappra, "Scattering Phenomenology of a Relevant In-Road Target," *58th Annual Meeting of the MSS Tri-Service Radar Symposium*, Boulder, CO, June 2012.
- K. Sherbondy, K. Kappra, G. Kirose, F. Koenig, G. Mazzaro, L. Nguyen, K. Ranney, G. Smith, M. Felton, K. Gurton, and C. Tran, "Fusion of Radar and Polarimetric IR for Buried Target Detection," *58th Annual Meeting of the MSS Tri-Service Radar Symposium*, Boulder, CO, June 2012.
- G. J. Mazzaro, "In-Situ Permittivity Measurements using Ring Resonators," *Proceedings of the SPIE*, Vol. 8361, pp. 836111(1-14), Apr. 2012.
- G. Mazzaro, K. Sherbondy, A. Sullivan, W. Folks, and J. McKenna, "Dielectric Characterization of HME-Based IEDs and In-Theater Soils for Ultra-Wide Band (UWB) Ground Penetrating Radar (GPR) Performance Predictions," *MSS Battlespace Acoustic and Seismic Sensing, Magnetic & Electric Field Sensors*, Washington, DC, Oct. 2011.
- A. Sullivan, K. Sherbondy, C. Le, and G. Mazzaro, "RF Signature Characterization of Emplaced Homemade Explosives," *MSS Battlespace Acoustic and Seismic Sensing, Magnetic & Electric Field Sensors*, Washington, DC, Oct. 2011.
- G. Mazzaro, K. Sherbondy, G. Smith, and J. Hu, "Portable Ring Resonator Permittivity Measurement System," *57th Annual Meeting of the MSS Tri-Service Radar Symposium*, Monterey, CA, June 2011.
- A. Martone, G. Mazzaro, D. McNamara, and M. Higgins, "Nonlinear Radar Stand-Off Techniques for RF Device Detection," *57th Annual Meeting of the MSS Tri-Service Radar Symposium*, Monterey, CA, June 2011.
- D. McNamara, E. Burke, D. Vance, C. Fazi, A. Martone, G. Mazzaro, B. Stanton, and M. Higgins, "Active Control of Remote Controlled Improvised Explosive Devices (RCIEDs)," *57th Annual Meeting of the MSS Tri-Service Radar Symposium*, Monterey, CA, June 2011.

- G. J. Mazzaro, M. A. Ressler, and G. D. Smith, "Attenuation of Front-End Reflections in an Impulse Radar using High-Speed Switching," *Proceedings of the SPIE*, Vol. 8021, pp. 802121(1-13), Apr. 2011.
- K. Ranney, L. Nguyen, F. Koenig, G. Kirose, A. Martone, G. Mazzaro, K. Sherbondy, C. Tran, and K. Kappra, "Side-Looking Image Formation with a Maneuvering Vehicle-Mounted Antenna Array," *Proceedings of the SPIE*, Vol. 8021, pp. 80211W(1-11), Apr. 2011.
- G. J. Mazzaro and A. F. Martone, "Switched-Tone Nonlinear Radar for Remotely Characterizing RF Devices," *Government Microcircuit Applications and Critical Technology Conference 2011*, Orlando, FL, Mar. 2011.
- G. J. Mazzaro, K. I. Ranney, and A. F. Martone, "Remote Identification of RF Devices by Long-Tail Resonance," *56th Annual Meeting of the MSS Tri-Service Radar Symposium*, Orlando, FL, June 2010.
- A. Martone, M. Ressler, G. Mazzaro, C. Fazi, D. McNamara, F. Koenig, and E. Burke, "Nonlinear Radar for RF Device Detection," *56th Annual Meeting of the MSS Tri-Service Radar Symposium*, Orlando, FL, June 2010.
- K. Sherbondy, K. Ranney, F. Koenig, L. Nguyen, G. Mazzaro, G. Smith, G. Kirose, C. Tran, T. Martone, and M. Ressler, "SIRE Radar Performance Assessment Against EFPs," *56th Annual Meeting of the MSS Tri-Service Radar Symposium*, Orlando, FL, June 2010.
- G. J. Mazzaro and K. I. Ranney, "Characterization of RF Front-Ends by Long-Tail Pulse Response," *Proceedings of the SPIE*, Vol. 7669, pp. 76690X(1-8), Apr. 2010.
- G. J. Mazzaro, M. B. Steer, and K. G. Gard, "Time-Frequency Effects in Wireless Communication Systems," *Government Microcircuit Applications and Critical Technology Conference 2010*, Reno, NV, Mar. 2010.
- G. J. Mazzaro, K. G. Gard, and M. B. Steer, "Low Distortion Amplification of Multisine Signals Using a Time-Frequency Technique," *IEEE MTT-S International Microwave Symposium Digest*, June 2009, pp. 901-904.
- G. Mazzaro, M. Steer, K. Gard, A. Melber, and M. Pollack, "Characterization of Radio-Frequency Front-Ends Using Switched-Tone Probes," *Government Microcircuit Applications and Critical Technology Conference 2009*, Orlando, FL, Mar. 2009.
- M. B. Steer, N. M. Kriplani, K. G. Gard, J. Hu, and G. J. Mazzaro, "The Origins and Modeling of Co-Site Interference in Military and Commercial Radios," *Government Microcircuit Applications and Critical Technology Conference 2009*, Orlando, FL, Mar. 2009.
- M. B. Steer, G. Mazzaro, J. R. Wilkerson, and K. G. Gard, "Exploiting Device-Circuit-Field Interactions in the Time-Frequency Domain," *Government Microcircuit Applications and Critical Technology Conference 2008*, Las Vegas, NV, Mar. 2008.
- G. Mazzaro, M. Steer, K. Gard, K. Ranney, K. Kappra, and A. Walker, "Remote Electronic Device Detection Using Switched-Tone Probes," *Government Microcircuit Applications and Critical Technology Conference 2008*, Las Vegas, NV, Mar. 2008.

M. Steer, G. Mazzaro, J. Wilkerson, K. Gard, and A. Walker, "Time-Frequency Effects in Microwave and Radio Frequency Electronics," *2007 International Conference on Signal Processing and Communication Systems*, Gold Coast, Australia, Dec. 2007.

Technical Reports & others (33)

G. J. Mazzaro and D. M. McNamara, "Stepped-Frequency Distributed Radar for Through-the-Wall Sensing: Resolution of Moving Targets by Orthogonal Antenna Pairs," *U.S. Army Research Laboratory Technical Report*, No. 9627, Jan. 2023.

G. J. Mazzaro and K. A. Gallagher, "Viruses Illuminated by Radio Frequencies: A Review of Openly Published Literature," *U.S. Army Research Laboratory Memorandum Report*, No. 1069, Jan. 2023.

G. Mazzaro, K. Gallagher, K. Sherbondy, and K. Salik, "Nonlinear Junction Detection vs. Target Orientation," *U.S. Army Research Laboratory Technical Report*, No. 9374, Jan. 2022.

G. J. Mazzaro, K. A. Gallagher, K. D. Sherbondy, and A. K. Salik, "Through-the-Wall Detection of Nonlinear Junctions," *U.S. Army Research Laboratory Technical Report*, No. 9229, June 2021.

G. Mazzaro, K. Salik, K. Gallagher, and K. Sherbondy, "High-Gain, High-Linearity Multi-Band Transceiver for Nonlinear Junction Detection," *U.S. Army Research Laboratory Technical Report*, No. 9140, Feb. 2021.

G. Mazzaro, K. Gallagher, D. Harvey, K. Salik, and K. Sherbondy, "Unintended Radio Frequencies Emitted by Swept Receivers: Passive Direct-Connect and Near-Field Wireless-Listen Experiments," *U.S. Army Research Laboratory Technical Report*, No. 9134, Jan. 2021.

G. Mazzaro, K. Gallagher, D. Harvey, K. Salik, and K. Sherbondy, "Stimulation of Unintended Emissions from Radio-Frequency Electronics: Modulation of an Internal Carrier Frequency by an External Tone," *U.S. Army Research Laboratory Technical Report*, No. 9109, Nov. 2020.

G. Mazzaro, K. Gallagher, A. Harrison, G. Kirose, and K. Sherbondy, "Back-to-Back Diplexers for Nonlinear Junction Detection," *U.S. Army Research Laboratory Technical Report*, No. 9087, Sept. 2020.

G. Mazzaro, K. Gallagher, K. Sherbondy, and B. Knapp, "Highly Linear Transceiver for a Portable Nonlinear Junction Detector," *U.S. Army Research Laboratory Technical Report*, No. 8957, May 2020.

G. Mazzaro, K. Gallagher, K. Sherbondy, and J. Owen, "Design of a Reconfigurable Transceiver for a Nonlinear Junction Detector," *U.S. Army Research Laboratory Technical Report*, No. 8849, Nov. 2019.

G. J. Mazzaro, K. A. Gallagher, and K. D. Sherbondy, "Measurement of the Acoustic-Radar Response of Electronics and Metals by Excitation with a Modal Thruster in a Transverse Electromagnetic Cell," *U.S. Army Research Laboratory Technical Report*, No. 8625, Jan. 2019.

G. J. Mazzaro, K. A. Gallagher, and K. D. Sherbondy, "Detection of Passive-Infrared-Triggered RF Devices by UHF Nonlinear Radar: Harmonics vs. Intermodulation," *Journal of DoD Research & Engineering*, Dec. 2018.

K. Ranney, K. Gallagher, G. Mazzaro, and S. Freeman, "Passive, Device-Centric, Synthetic Aperture Radar Imaging," *U.S. Army Research Laboratory Technical Report*, No. 8297, Feb. 2018.

G. J. Mazzaro, A. J. Sherbondy, M. R. Judy, and K. A. Gallagher, "Detection of Metallic and Electronic Radar Targets by Acoustic Modulation of Electromagnetic Waves," *U.S. Army Research Laboratory Technical Report*, No. 8076, July 2017.

G. J. Mazzaro, A. J. Sherbondy, K. I. Ranney, and K. D. Sherbondy, "Conversion of Radio-Frequency Pulses to Continuous-Wave Sinusoids by Fast Switching and Narrowband Filtering," *U.S. Army Research Laboratory Technical Note*, No. 0783, Sept. 2016.

S. F. McGowan, G. J. Mazzaro, K. D. Sherbondy, and R. M. Narayanan, "Harmonic Phase Response of Nonlinear Radar Targets," *U.S. Army Research Laboratory Technical Report*, No. 7513, Oct. 2015.

G. J. Mazzaro, K. I. Ranney, K. A. Gallagher, S. F. McGowan, and A. F. Martone, "Simultaneous-Frequency Nonlinear Radar: Hardware Simulation," *U.S. Army Research Laboratory Technical Note*, No. 0691, Aug. 2015.

G. J. Mazzaro, K. A. Gallagher, A. R. Owens, K. D. Sherbondy, and R. M. Narayanan, "Ultra-Wideband Harmonic Radar for Locating Radio-Frequency Electronics," *U.S. Army Research Laboratory Technical Report*, No. 7256, Mar. 2015.

D. McNamara, D. Haugh, D. Wolf, R. Harris, D. Guy, M. Ressler, A. Harrison, C. Fazi, M. Higgins, and G. Mazzaro, "Whistler Developmental System Version 3.0," *U.S. Army Research Laboratory Technical Report*, No. 6688, Nov. 2013.

G. J. Mazzaro and K. D. Sherbondy, "Combined Linear & Nonlinear Radar: Waveform Generation and Capture," *U.S. Army Research Laboratory Technical Report*, No. 6427, Apr. 2013.

G. J. Mazzaro and J. M. Wetherington, "Intermodulation Distortion Measurements using Analog Cancellation," *U.S. Army Research Laboratory Technical Report*, No. 6370, Mar. 2013.

G. J. Mazzaro, A. F. Martone, and D. W. Vance, "Harmonic and Multitone Radar: Data on Current Threats," *U.S. Army Research Laboratory Technical Report*, No. 6315, Feb. 2013.

A. Martone, D. McNamara, G. Mazzaro, and A. Hedden, "Cognitive Nonlinear Radar," *U.S. Army Research Laboratory Memorandum Report*, No. 0837, Jan. 2013.

G. J. Mazzaro and A. F. Martone, "Harmonic and Multitone Radar: Theory and Experimental Apparatus," *U.S. Army Research Laboratory Technical Report*, No. 6235, Oct. 2012.

J. M. Wetherington and G. J. Mazzaro, "High Dynamic Range Measurement System using Analog Cancellation," *U.S. Army Research Laboratory Technical Report*, No. 6234, Oct. 2012.

G. J. Mazzaro and K. D. Sherbondy, "Permittivity Measurements on Homemade Explosives using Ring Resonators," *U.S. Army Research Laboratory Technical Note*, No. 0482, Apr. 2012.

G. Mazzaro, G. Smith, G. Kirose, and K. Sherbondy, "Effect of Cold Temperature on the Dielectric Constant of Soil," *U.S. Army Research Laboratory Technical Note*, No. 0479, Apr. 2012.

G. Mazzaro, K. Sherbondy, G. Smith, M. Ressler, and R. Harris, "Portable Ring-Resonator Permittivity Measurement System: Design & Operation," *U.S. Army Research Laboratory Technical Report*, No. 5993, Apr. 2012.

G. Mazzaro, M. Ressler, G. Smith, and F. Koenig, "Attenuation of Spurious Impulses from an Ultra-Wideband Radar: A High-Speed Switch for the Synchronous Impulse Reconstruction (SIRE) Frontend," *U.S. Army Research Laboratory Technical Report*, No. 5750, Sept. 2011.

G. J. Mazzaro and K. D. Sherbondy, "Ring-Resonator Permittivity Measurements at ALC, July 2011," *U.S. Army Research Laboratory Technical Note*, No. 0443, Sept. 2011.

B. Stanton, F. Koenig, G. Mazzaro, M. Ressler, K. Sherbondy, and G. Smith, "Ultra Wideband (UWB) Synchronous Impulse Reconstruction (SIRE) Radar Upgrade Assessment Field Experiment," *U.S. Army Research Laboratory Technical Report*, No. 5531, Apr. 2011.

G. J. Mazzaro, "Time-Frequency Effects in Wireless Communication Systems," *Ph.D. Dissertation*, North Carolina State University, Raleigh, NC, Oct. 2009.

G. J. Mazzaro, "Analysis and Simulation of the Effects of Atmospheric Turbulence on Optical Wave Propagation," *M.S. Thesis*, State University of New York, Binghamton, NY, May 2006.

Invited Talks

G. J. Mazzaro, "What is Research? An Introduction to Graduate Education," *45-minute seminar* provided to ELEC 206 (Sept. 2023) and ELEC 422 (Jan. 2024).

G. J. Mazzaro, "Introduction to Ultra-Wideband and Nonlinear Radar," *2-day seminar*, U.S. Army Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, and Reconnaissance Center (C5ISR) Research and Technology Integration (RTI) Directorate, Ft. Belvoir, VA, July 2023.

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, "Technical Communication: A Research Engineer's Point-of-View," *45-minute seminar* provided to COMM 260, Apr. 2021.

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.

G. J. Mazzaro, A. F. Martone, and K. A. Gallagher, "Using Radar to Locate and Identify RF Electronics," seminar provided to the *Coastal South Carolina Section of the IEEE*, Charleston, SC, Dec. 2014.

G. Mazzaro, K. Sherbondy, B. Phelan, and F. Koenig, "Introduction to Stepped-Frequency Radar," *90-minute seminar*, U.S. Army Research Laboratory, Adelphi, MD, June 2013.

G. J. Mazzaro and A. J. Sullivan, "Dielectric Characterization of Materials & Electromagnetic Modeling of UWB GPR for Buried HME Detection," *MSS Tri-Service Radar Symposium, Counter-IED workshop*, Boulder, CO, June 2012.

M. Higgins, G. Mazzaro, A. Martone, D. McNamara, D. Vance, "REDLINE and Sensitive RF Overview," *MSS Tri-Service Radar Symposium, Counter-IED workshop*, Boulder, CO, June 2012.

M. Higgins, M. Berry, G. Mazzaro, and B. Nelson, "The Army Research Laboratory REDLINE Program," *Directed Energy Systems Symposium*, Gaithersburg, MD, Apr. 2012.

G. J. Mazzaro, "Nonlinear Radar Concepts," *RF Signal Processing & Modeling Branch briefing*, U.S. Army Research Laboratory, Adelphi, MD, Jan. 2012.

M. Steer, J. Wilkerson, G. Mazzaro, and J. Wetherington, "Passive Intermodulation Distortion in Microwave Systems," *Fall Meeting of the IEEE Microwave Theory & Techniques Society and Antennas & Propagation Society*, Bergen, Norway, Oct. 2011.

G. J. Mazzaro, K. D. Sherbondy, G. D. Smith, R. W. Harris, and A. J. Sullivan, "Characterization of Dielectric Materials using Ring Resonators," *U.S. Army Research Laboratory Technical Advisory Board laboratory demonstration*, Adelphi, MD, May 2011.

M. Steer, J. Wilkerson, and G. Mazzaro, "Passive Intermodulation Distortion and Managing Co-Site Interference," *14th Annual Landmine & Buried Explosive Object Detection Research Review Meeting*, Washington, DC, Feb. 2011.

G. Mazzaro, K. Sherbondy, and J. Hu, "Portable Ring-Resonator Permittivity Measurement System," *USNC-URSI National Radio Science Meeting*, Boulder, CO, Jan. 2011.