

Colan Graeme Matthew Ryan

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SUMMARY

- More than eight years' experience in antenna and RF engineering research
- Experienced in microwave circuit simulation, fabrication, and characterization
- Demonstrated communication ability in technical writing, academic tutoring, and youth engagement

EDUCATION

Current **Ph.D. Candidate in Electrical Engineering (Expected 2015) (G.P.A 3.9/4.0)**

University of Toronto, Canada

- Thesis topic: Multi-band Microwave Devices using Transmission-Line Metamaterials

December 2008 **M.A.Sc. Electrical Engineering (G.P.A 3.9/4.0)**

Royal Military College of Canada, Canada

- Thesis topic: A Wideband Transmitarray Using Double Square-Ring Elements

December 2006 **B.A.Sc. Electrical Engineering (Microwave/Photonics Co-op option) (G.P.A 4.0/4.0)**

University of Ottawa, Canada

- Capstone project: A Low-noise MEMS-based Voltage-Controlled Oscillator

WORK EXPERIENCE

January 2009- Present

Research Assistant and Ph.D. Candidate, Dept. of Electrical and Computer Engineering, University of Toronto

I am a research assistant developing novel antennas and microwave circuits using transmission-line metamaterials. The goal of my work is to enable multi-band or broadband operation and to reduce device size while still using low-cost, printed-circuit technology. I have presented my research to technical audiences at both national and international engineering conferences and have many publications in peer-reviewed academic journals.

As part of my research and studies, I have taken multiple courses on microwave component and antenna design and electromagnetic analysis. I have worked on printed antennas, filters, couplers, and transistor amplifiers using commercial software such as Ansys HFSS, Agilent ADS/Momentum, and MATLAB; I have extensive hands-on fabrication experience using both circuit board plotters and photolithography clean rooms.

Finally, I supervise access to our research group's labs and fabrication facilities. I assist external users in producing and measuring their components in our anechoic antenna chamber, our microwave test lab, and our lithography and milling labs.

April 2007 – Present**Co-founder, MEMwave, Inc.**

I am the Vice-President of MEMwave Inc., a company specializing in the design of small antennas and RF systems for portable radio devices. Our company has been awarded a United States patent for a reconfigurable multi-band antenna using an RF-MEMS switch. My primary role was the development, analysis, and testing of new antennas for mobile devices. I also act as the company accountant and prepare corporate tax forms and returns.

September 2009 – Present**University of Toronto Teaching Assistant (ECE110/ECE320/ECE524)**

I am a teaching assistant conducting both tutorials and laboratories at the graduate and undergraduate levels where the topics covered include microwave engineering, electromagnetics, and introductory electrical engineering. I run weekly tutorials and laboratories, conduct cumulative review classes, and grade and provide feedback on student work. I have also lectured in graduate classes as a substitute for absent professors.

May – August 2006 (Co-op Position)**NSERC Undergraduate Student Researcher, Carleton University, Department of Electronics**

I jointly developed a MEMS-based reconfigurable antenna using ADS Momentum and CST Microwave Studio. I jointly obtained a patent on this invention and co-founded MEMwave to commercialize the research.

September – December 2005 (Co-op Position)**Systems Group, Edgewater Computer Systems**

My role in the Systems Group was to conduct system integration tests and troubleshoot hardware components using spectrum analyzers and digital oscilloscopes.

May – June 2004 & January – April 2005 (Co-op Position)**Database Programmer, Office of the Information and Privacy Commissioner of Canada**

I was a database and web programmer responsible for developing a department-wide intranet and database system using SQL Server, ASP-ADO, HTML, and VBScript.

SKILLS

Electrical Engineering & Electromagnetics

- Electromagnetic and RF circuit simulation: Ansys HFSS, Agilent ADS/Momentum, Cadence, and CST Microwave Studio
- Microwave device fabrication: photolithography, LPKF automated milling processes
- Microwave device testing: Power Network Analyzer, antenna anechoic chamber (both near- and far-field with NSI and 959 Spectrum software tools)

Computers

- Programming languages : MATLAB, C, SQL, ASP-ADO

Communication

- Strong record of publications in peer-reviewed academic journals and of oral presentations at international engineering conferences
- Six-years' experience as a teaching assistant in various graduate and undergraduate electrical engineering courses

Languages

- English (fluent written/oral), French (working proficiency), German (limited working proficiency)

PEER-REVIEWED JOURNAL PUBLICATIONS

- [1] C.G.M.Ryan and G.V.Eleftheriades, "Single- and dual-band transparent circularly polarized patch antennas with metamaterial loading," *IEEE Antennas and Wireless Propagation Letters* (in press).
- [2] C.G.M.Ryan and G.V.Eleftheriades, "Two compact, wideband, and decoupled meander-line antennas based on metamaterial concepts," *IEEE Antennas and Wireless Propagation Letters*, vol. 11, pp. 1277-1280, November, 2012.
- [3] C.G.M. Ryan and G. V. Eleftheriades, "Multiband microwave passive devices using generalized negative-refractive-index transmission lines (invited paper)," *International Journal of RF and Microwave Computer-Aided Engineering*, vol. 22, no. 4, pp. 459-468, July 2012.
- [4] C.G.M.Ryan and G.V.Eleftheriades, "Design of a printed dual-band coupled-line coupler with generalised negative-refractive-index transmission lines," *IET Microwaves, Antennas, and Propagation*, vol. 6, no. 6, pp. 705-712, April 2012.
- [5] C. G. M. Ryan, M.R. Chaharmir, J. Shaker, J. R. Bray, Y.M.M. Antar, and A. Ittipiboon, "A wideband transmitarray using dual-resonant double square rings," *IEEE Transactions on Antennas and Propagation*, vol. 58, no. 5, pp. 1486-1493, May 2010.

PEER-REVIEWED CONFERENCE PUBLICATIONS

- [1] C.G.M.Ryan and G.V.Eleftheriades, "A single-ended all-pass generalized negative-refractive-index transmission line using a bridged-T circuit," 2012 IEEE MTT-S International Microwave Symposium, Montreal, Canada, June 17-22, 2012.
- [2] C.G.M.Ryan and G.V.Eleftheriades, "A wideband metamaterial meander-line antenna," European Conference on Antennas and Propagation (EuCAP), Prague, Czech Republic, March 26-30, 2012.
- [3] C.G.M.Ryan and G.V.Eleftheriades, "A printed dual-band coupler using generalized negative-refractive-index transmission-lines," IEEE MTT-S International Microwave Symposium, Baltimore, USA, June 5-10, 2011.
- [4] C.G.M.Ryan and G.V.Eleftheriades, "A dual-band leaky-wave antenna based on generalized negative-refractive-index transmission lines," 2010 International Symposium on Antennas and Propagation, Toronto, Canada, July 11-17, 2010.
- [5] C. G. M. Ryan, M.R. Chaharmir, J. Shaker, J. R. Bray, Y.M.M. Antar, and A. Ittipiboon, "A broadband transmitarray using double square ring elements," 13th Int. Symposium on Antenna Technology and Applied Electromagnetics, Banff, AB, 2009.

PATENTS

- [1] V. Narasimhan and C. Ryan, "Reconfigurable multi-band antenna and method of operation of a reconfigurable multi-band antenna," United States patent no. 8,339,328, issued December 25, 2012.

NON-PEER-REVIEWED CONFERENCE PRESENTATIONS

- [1] V. Narasimhan, C. Ryan, and R. N Tait, "Using MEMS capacitive switches in reconfigurable antennae," Exhibition presentation at the 5th Canadian Workshop on MEMS and Microfluidics, Montreal, QC, August, 2007.

AWARDS

- University of Toronto Doctoral Completion Award (2013)
- Best Student Paper competition finalist in *2012 European Conference on Antennas and Propagation* for "A Wideband Metamaterial Meander-Line Antenna"
- Queen Elizabeth II/Slemon Scholarship in Science and Technology (2012)
- NSERC Canada Graduate Scholarship- Doctoral (2009)
- NSERC Canada Graduate Scholarship- Masters (2007)
- Ontario Graduate Scholarship-Declined (2007)
- NSERC Undergraduate Research Award (2006)
- University of Ottawa Merit Scholarships (2005, 2006)
- 1st place and Environmental Awareness Award at 2005 Canadian Engineering Competition for research and presentation on clean energy
- 2nd place at 2004 Ontario Engineering Competition for research and presentation on commercial space travel
- Chancellor's Scholarship for University of Ottawa's Faculty of Engineering (2002)

INTERESTS

I have a strong interest in teaching and mentoring which extends beyond my duties as a teaching assistant. I am active in several martial arts and spent several years as an assistant Taekwondo instructor where I led classes for both children and adults. I also volunteer at the University of Toronto's 'Open-House' days where I conduct information sessions and lab tours for prospective students. Finally, I serve as a regular reviewer for three different academic journals.

REFERENCES

Available upon request