GREGORY L. CHARVAT
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EDUCATION

MICHIGAN STATE UNIVERSITY — **EAST LANSING, MI**

Doctorate of Science in Electrical Engineering — August 2007
Dissertation: G. L. Charvat, "A Low-Power Radar Imaging System." Ph.D. Dissertation, Dept. of Electrical and Computer Engineering, Michigan State University, East Lansing, MI, 2007.

Masters of Science in Electrical Engineering — December 2003
Masters Thesis: G. L. Charvat, "A Unique Approach to Frequency-Modulated Continuous-Wave Radar Design." East Lansing MI: A thesis, submitted to Michigan State University, 2003, in partial fulfillment of the requirements for the degree of Master of Science.

Bachelor of Science in Electrical Engineering — May 2002
Capstone Project: An L-Band UWB Impulse Radar System.

BOOK

G. L. Charvat, *Small and Short-Range Radar Systems,* CRC Press, Publication date March 21, 2014.

http://www.amazon.com/Short-Range-Practical-Approaches-Electrical-Engineering/dp/143986599X

"This book is absolutely unique in its focus on hands-on construction and demonstration of a variety of small, low-power, short-range radar systems. It is supported by extensive online support resources: measured data sets, MATLAB® analysis software, additional documentation, and demonstration videos. With the aid of this book, anyone with basic electronic circuit skills can construct and operate their own small radar systems and demonstrate essential radar techniques, from such basic operations as moving target detection and speed measurement to sophisticated imaging methods. …It is no exaggeration to say that no other book compares with this one. "
—Dr. Mark A. Richards, Georgia Institute of Technology, Atlanta, USA

"The book is applications-oriented with just enough information, delivered at just the right points, to give the reader a straightforward, clear understanding and appreciation of radar for practical applications. I can think of no other texts that specifically apply conventional radar theory to general short-range problems. ...This book is a great reference, one that should be on every radar designer's bookshelf."
—Prof. Carey Rappaport, Northeastern University, Boston, Massachusetts, USA

"This textbook fills a large void by providing real world examples of Doppler, ranging, and synthetic aperture radar systems along with extensive examples of radar sensitivity and design parameters. Its coverage of fundamental radar principles in a form directly accessible to students is unique, and provides a needed hands-on based approach to the subject."
—Dr. Philip Erickson, Principal Research Scientist, MIT Haystack Observatory, Westford, Massachusetts, USA

"I wish I had a book like this when I was developing short-range radars. …The best feature of this book is the wealth of practical information in the form of block diagrams, circuit diagrams, and measurement results that help the reader understand how to turn the theory of small radars into practice. "
—Prof. Daniel Fleisch, Wittenberg University, Springfield, Ohio, USA

BOOK SERIES

Gregory L. Charvat Series on Practical Approaches to Electrical Engineering, CRC Press. Titles include:

Albert Sabban, *Low Visibility Antennas for Communication Systems*.

Juha Vierinen, *Practical Software Defined Radar Remote Sensing*.

PATENTS

MICHIGAN STATE UNIVERSITY and THE DOW CHEMICAL COMPANY — EAST LANSING, MI
"Harmonic Wireless Transponder Sensor and Method" — January 2007
US Patent No.: 7,145,453

BUTTERFLY NETWORK INC. — GUILFORD, CT
"Transmissive Imaging and Related Apparatus and Methods" — 2013
US Patent No.: 20,130,116,561

BUTTERFLY NETWORK INC. — GUILFORD, CT
"Transmissive Imaging and Related Apparatus and Methods" — 2013
US Patent No.: 2,013,059,0358

Others in application process.

COURSES

G. L. Charvat, D. Staelin, A. J. Fenn, B. Perry, *Build a Small Radar System Capable of Range, Doppler, and SAR Imaging [PI.80s].* (Massachusetts Institute of Technology: MIT Professional Education Program), August 2011.
http://web.mit.edu/professional/short-programs/courses/radar_systems.html

Charvat, Gregory L., Jonathan H. Williams, Alan J. Fenn, Steve Kogon, and Jeffrey S. Herd. *RES.LL-003 Build a Small Radar System Capable of Sensing Range, Doppler, and Synthetic Aperture Radar Imaging, January IAP 2011*. (Massachusetts Institute of Technology: MIT OpenCourseWare), http://ocw.mit.edu (Accessed 23 Oct, 2011). License: Creative Commons BY-NC-SA. http://ocw.mit.edu/resources/res-ll-003-build-a-small-radar-system-capable-of-sensing-range-doppler-and-synthetic-aperture-radar-imaging-january-iap-2011/index.htm

JOURNALS

G. L. Charvat, L. C. Kempel, E. J. Rothwell, C. Coleman, and E. L. Mokole, ``A through-dielectric ultrawideband (UWB) switched-antenna-array radar imaging system" *IEEE Transactions on Antennas and Propagation*, Vol. 60, No. 11, November 2012, pp. 5495-5500.

G. L. Charvat, J. E. Peabody, J. Goodwin, and M. Tobias, ``A real-time through-wall imaging system" *MIT Lincoln Laboratory Journal*, June 2012.

G. L. Charvat, L. C. Kempel, E. J. Rothwell, C. Coleman, and E. L. Mokole, ``A through-dielectric radar imaging system," *IEEE Transactions on Antennas and Propagation*, vol. 58, Issue 8, pp. 2594-2603, August 2010.

T. S. Ralston, G. L. Charvat, S. G. Adie, B. J. Davis, S. Carney, S. A. Boppart, ``Interferometric synthetic aperture microscopy microscopic laser radar," *Optics and Photonics News*, Vol. 21 No. 6, June, 2010.

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G. L. Charvat, L. C. Kempel. "Synthetic Aperture Radar Imaging Using a Unique Approach to Frequency-Modulated Continuous-Wave Radar Design." *IEEE Antennas and Propagation Magazine*, February 2006.

MAGAZINE ARTICLES AND COLUMNS/GUEST BLOG POSTS

G. L. Charvat, "Radar Imaging in your Garage: Synthetic Aperture Radar," Guest Post, Hackaday, March 17, 2014.
http://hackaday.com/2014/03/17/radar-imaging-in-your-garage-synthetic-aperture-radar/

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G. L. Charvat, "Transceiving with an R-390A," QST Magazine "Hints and Kinks" Column, March 2014.

G. L. Charvat, "Try Radar for your Next Project," Guest Post, Hackaday, February 24, 2014.
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G. L. Charvat, J. Goodwin, M. Tobias, J. Pozderac, and J. Peabody "A real-time through-wall radar system using a time division multiplexed (TDM) multiple-input multiple-output (MIMO) antenna array; measured results and performance" Atlanta, GA: IEEE Radar Conference, May 2012.

G. L. Charvat, A. J. Fenn, and B. T. Perry "The MIT IAP radar course: build a small radar system capable of sensing range, doppler and synthetic aperture radar (SAR) imaging" Atlanta, GA: IEEE Radar Conference, May 2012.

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L. Zong, G. L. Charvat, L. C. Kempel. "Automated Method for Characterizing Temperature Dependent Dielectric Materials." Atlanta Georgia: Antennas Measurement Techniques Association conference, October 2004.

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G. L. Charvat, C. McGruder III. "Ionosphere Observing High Frequency Radar System." NASA/TSU Research Symposium, March 23, 2001.

G. L. Charvat, C. McGruder III. "Ionosphere Observing High-Frequency Radar System." NASA URC-SC Conference, April 7-10, 2000.

G. L. Charvat. "Ionosphere Observing High-Frequency Radar System." University Undergraduate Research and Creative Activity Forum, Michigan State University, March 31, 2000.

G. L. Charvat, C. McGruder III. "Ionosphere Observing High-Frequency Radar System." NASA URC-SC Conference 1998.

SEMINARS

G. L. Charvat. "Small and Short-Range Radar Systems" IEEE Life Affinity Chapter, March 19, 2014.

G. L. Charvat. "From trash-picking to startup," Regional Leadership Development Conference, Society of Hispanic Professional Engineers, March 9, 2013.

G. L. Charvat, B. T. Perry, J. P. Kitchens. "The MIT IAP 2012 radar course: build a small phased array radar system capable of imaging moving targets," The Boston Chapters of the IEEE Life Members, AES, and Signal Processing Society, May 34, 2012.

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G. L. Charvat. "Design and fabrication of high-fidelity vacuum tube audio-frequency power amplifiers," MIT Haystack Observatory, February 3, 2010.

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G. L. Charvat. "Low-cost, high-resolution, X-band laboratory radar system for synthetic aperture radar applications," Michigan State University Chapter of the IEEE, January 31, 2007.

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S. Becker, “Early curiosity leads to a lifelong engineering pursuit,” Audio Express Magazine, October 2013, pp. 29-32.
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