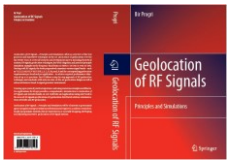
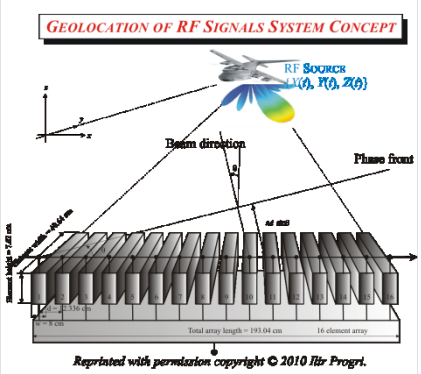
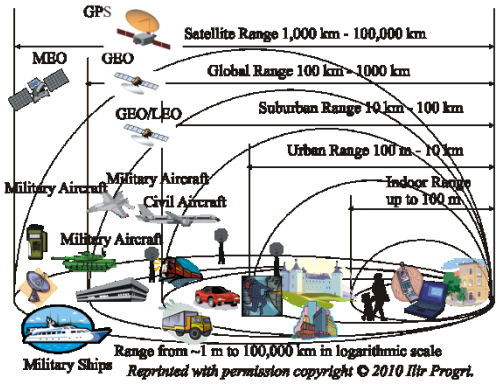


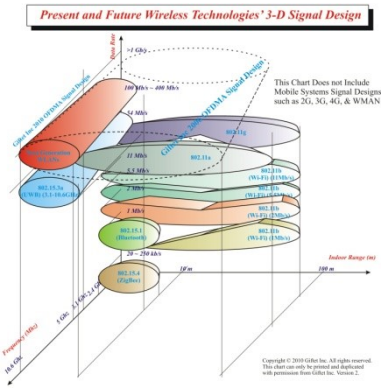
Geolocation of RF Signals: Principles and Simulations

Giftet® Geolocation of RF Signals: Principles and Simulations

ISMICT 2016, Sunday, Mar. 20, 2016 9:00 AM to 12:00 PM: Half Day Tutorial
Worcester, Massachusetts, USA







TARGET AUDIENCE FOR TUTORIAL

The principle simulation examples which are discussed in a great detail in this tutorial offer invaluable insights, all in one source for the beginner, the experienced, expert analysts and professionals: RF engineers, system engineers, design engineers, signal processing engineers etc.

TUTORIAL ABSTRACT: [1 PARAGRAPH]

GEOLOCATION of RF Signals: Principles and Simulations offers an overview of the best practices and innovative techniques in the art and science of geolocation for *communication and localization for medical information in military applications* over the last twenty years. It covers all research and development aspects including theoretical analysis, RF signals, geolocation techniques, key block diagrams, and practical principle simulation examples in the frequency band from 100 MHz to 18 GHz or even 66 GHz. Dr. Progri reveals the research and development process by demonstrating how to understand and explain geolocation of RF signals from basic diagrams to the final principle simulation examples and make recommendations for the future final products of geolocation of RF signals. Starting with RF signals, the tutorial progressively examines various signal bands – such as VLF, LF, MF, HF, VHF, UHF, L, S, C, X, Ku, and, K and the corresponding geolocation requirements per band and per application – to achieve required performance objectives of up to 0º precision. Next follows a step-by-step approach of RF geolocation techniques and concludes with notes on state-of-the-art geolocation designs as well as advanced features found in signal generator instruments. The tutorial also includes the best mathematical techniques employed for geolocation of RF signals at 100 MHz to 18 GHz or even 66 GHz.

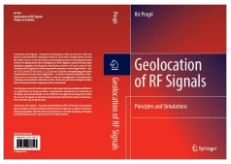
OUTLINE OF THE TUTORIAL:

1. Introduction to *Geolocation of RF Signals (GRFS): Principles and Simulations for Communication and Localization for Medical Information in Military Applications* (new this year)
2. Requirements for Description of GRFS Systems for *Communication and Localization for Medical Information in Military Applications* (new this year)
3. RF Signals (emphasis on *Communication and Localization for Medical Information in Military Applications*) (new this year)
4. Adaptive Array Algorithms for GRFS Systems (new this year)
5. Best Recursive Linear Algorithms for Adaptive Array Processing (new this year)
6. Adaptive Array Beamforming for Interference Mitigation for GRFS Systems
7. Recognition, timeliness and agility of *Geolocation of RF Signals (GRFS): Principles and Simulations* (new this year)

Giftet Inc.
5 Euclid Ave. Apt. 3
Worcester, MA 01610

Contact: Ilir Progri
Tel./Fax 508-791-3304
iprogri@verizon.net

www.giftet.com



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Geolocation of RF Signals: Principles and Simulations

DETAILED SUMMARY: [2-3 PARAGRAPHS]

The main purpose of this tutorial is to research, investigate, and propose the navigation, communications, and geolocation properties, requirements, and capabilities of several candidate radio frequency (RF) signals in the entire frequency band of 100 MHz to 18 GHz in open outdoor, suburban, urban, and indoor environments and also in closed indoor environments for communication and localization for medical information in military applications. In order to accomplish this effectively we will:

(1) introduce the best state of the art geolocation of RF signals techniques in Chap. 1 (new content this year);

(2) address the Part 1. requirements of systems for geolocation of RF signals in part 2;

(3) extensively describe RF signals in the desired frequency spectrum of 100 MHz to 66 GHz in part 3 (new content this year);

(4) description of the blind geolocation of RF signals for communication and localization for medical information in military applications in part 4 in great details (new content this year);

(5) address the computation complexity for successfully achieving the desired objectives in signal processing starting with recursive algorithms such as Cholesky and MGSO in part 5 (new content this year);

(6) address the recursive generalized eigen-value solution in part 5 (new content this year);

(7) address parallel architecture implementation in parts 5 and 6; (Entirely new content this year)

(8) investigate certain applications of geolocation of RF signals systems which includes signal suppression and interference mitigation applications starting with a GPS adaptive temporal selective attenuator in part 6 (new content this year);

(9) an adaptive spatial temporal selective attenuator in part 6 (new content this year);

(10) an improved adaptive temporal selective attenuator in part 6 (new content this year);

(11) conclude our tutorial with a discussion on recognition, timeliness and agility of *Geolocation of RF Signals (GRFS): Principles and Simulations* (new this year) in part 6.

MENTOR BIOGRAPHY:

Dr. Ilir Progri is a world renowned *pioneer leading authority* in Geolocation/GPS/GNSS/Global Wireless Communications in all aspects of significantly improved signal specifications, simulation, software development, and implementation.

He has: (1) *two pioneer book publications*, *one patent*, *six world class tutorials*, and over *eighty five* published referred journal/magazine articles, conference publications, tutorials, etc. in all aspects of geolocation, RF geolocation, geo-intelligence, and geo-reference systems; (2) received recognition by over *two hundred and three* publications: (a) *eleven* book authors; (b) *thirty-three* peer review IEEE journal paper and/or magazine article author(s); (c) *three* peer review IEE or IET journal paper and/or magazine article author(s); (d) *eighteen peer-review* Navigation/JGPS/springer/Wiley/ Hindawi/ PIERS Online J. Papers and/or Magazine Articles ; (e) *forty five* peer review other journal paper and/or magazine article author(s); (f) *sixteen* peer review newsletter article author(s); (g) *ten* patent inventors; (h) *eighteen* Ph.D. dissertation student scholars; (i) *ten* M.S. thesis student scholars; and (j) *thirty-nine* conference proceedings authors; i.e., *eighty one percent from high quality peer review publications* from scientists of US, Canada, Australia, UK, Finland, France, Italy, Germany, Russia, China, Croatia, Japan, Spain, Switzerland, Singapore, Korea, Taiwan, Hong Kong, Egypt, etc.

He is currently the Chairman, CEO, and President of Giftet Inc. [www.giftet.com]. He is a FRIN, SM IEEE, and MION.

REFERENCES (INCLUDING ANY PREVIOUS STUDENTS):

1. **Progri, I.,** *Geolocation of RF Signals—Principles and Simulations*, Tutorial IEEE MILCOM'14, Baltimore, MD, Nov. 2014, http://www.milcom.org/.
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4. **Progri, I.,** *Geolocation of RF Signals—-Principles and Simulations*, 1st ed., New York, NY: Springer Science and Business Media, LLC, 330 pp., Jan. 2011 [Online http://www.springer.com/engineering/electronics/book/978-1-4419-7951-3].
5. **Progri, I.,** *Geolocation of RF Signals*, Tutorial 17 IEEE RadarCon'09, Pasadena, CA, May 2009.
6. Also on Facebook: https://www.facebook.com/GeolocationOfRfSignalsPrinciplesAndSimulations

Giftet Inc.
5 Euclid Ave. Apt. 3
Worcester, MA 01610

Contact: Ilir Progri
Tel./Fax 508-791-3304
iprogri@verizon.net

www.giftet.com