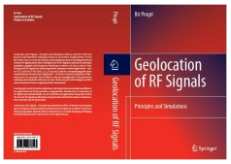
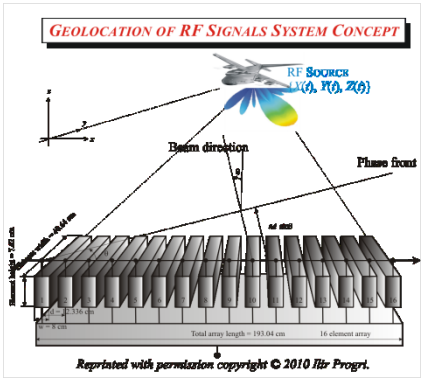
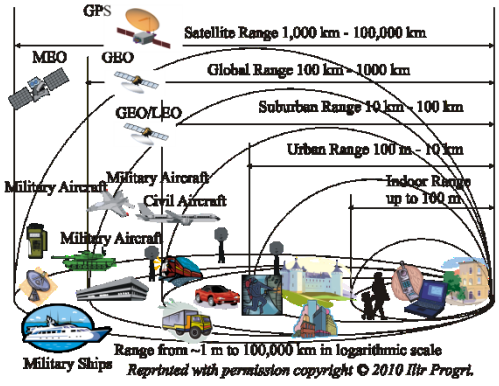


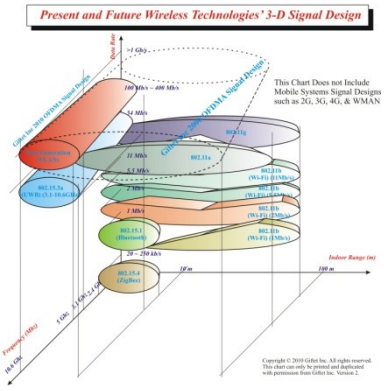
Geolocation of RF Signals: Principles and Simulations

Giftet® Geolocation of RF Signals: Principles and Simulations

IEEE HC 2015, Oct. 17, 2015: 9:00 AM – 9:45 AM + 15 min Q&A Keynote Address
575 Memorial Drive, Cambridge, MA 02139, USA







TARGET AUDIENCE FOR KEYNOTE

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.

KEYNOTE 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 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 0^{o} 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 KEYNOTE:

1. Introduction to *Geolocation of RF Signals (GRFS): Principles and Simulations*
2. Requirements for Description of GRFS Systems
3. RF Signals (emphasis on Wireless Communications)
4. Adaptive Array Algorithms for GRFS Systems
5. Best Recursive Linear Algorithms for Adaptive Array Processing
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)

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

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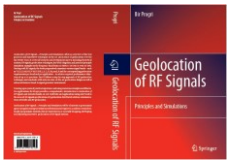

frequency band of 100 MHz to 18 GHz in open outdoor, suburban, urban, and indoor environments and also in closed indoor environments. In order to accomplish this effectively we will:

(1) introduce the best state of the art geolocation of RF signals techniques in chapter 1;

(2) address the Part 1. INTRODUCTION TO GEOLOCATION OF RF SIGNALS 3 requirements of systems for geolocation of RF signals in part 2;

(3) briefly describe RF signals in the desired frequency spectrum of 100 MHz to 66 GHz in part 3;

(4) description in great detail of the blind geolocation of RF signals in part 4;

(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;

(6) address the recursive generalized eigen-value solution in part 5;

(7) 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;

(8) an adaptive spatial temporal selective attenuator in part 6;

(9) an improved adaptive temporal selective attenuator in part 6;

(10) 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.

KEYNOTE 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 six* 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;(j) *one* Diploma of Engineer student scholar; and (k) *forty-one* conference proceedings authors; i.e., *eighty 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. He is the Editor-in-Chief (EIC) & Scientific Editor of the Journal of Geolocation, Geo-information and Geo-intelligence of http://www.giftet.com/uploads/3/5/1/1/3511542/giftet_jg3.pdf.

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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

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