



SPECTRUM CHALLENGE

Program Guide

March 19-20, 2014
Arlington, VA



Welcome to the DARPA Spectrum Challenge Final Event!



The DARPA Spectrum Challenge Final Event, being held March 19-20, 2014, in Arlington, Va., represents the culmination of an intense one-year effort by the 18 finalist teams. Of the 90 teams that initially entered the Spectrum Challenge in January 2013, the top 18 participated in the Spectrum Challenge Preliminary Event held September 11-12, 2013.

We are extremely proud of these teams. Their enthusiasm and can-do attitude are contagious, and we are confident that you will enjoy seeing them in action as they showcase their adaptive, software-based radio communications techniques in this Final Event. We want to thank all who have made the Spectrum Challenge possible, especially the supporters and sponsors who have helped the teams reach this important stage. Let the competition begin!

- Dr. Yiftach Eisenberg, DARPA I2O Program Manager

What is the Spectrum Challenge?

Spectrum Challenge teams compete to develop adaptive radio designs that can most effectively operate in congested and contested electromagnetic environments. The Spectrum Challenge is not focused on developing new radio hardware, but instead seeks algorithmic strategies for guaranteeing successful communication in the presence of other radios without explicit coordination.

The Preliminary Event featured a sequence of head-to-head competitions between each team's software radio protocols on a standardized software-defined radio hardware platform. The Preliminary Event served as a valuable learning experience that helped each team discover their strengths, weaknesses and new ideas as they refined their designs for the Final Event.

The Final Event repeats the format of the Preliminary Event except the stakes are much higher: The team whose software most reliably achieves successful communication in the presence of other competing radios could win as much as \$100,000. For more information, visit the DARPA Spectrum Challenge program page at www.darpa.mil/spectrumchallenge.

Agenda

March 19-20, 2014
Arlington, VA



DAY 1 – WEDNESDAY, MARCH 19, 2014

- 0730 – 0830 Registration
0830 – 0900 Welcome and DARPA Spectrum Challenge Overview
0900 – 0920 Keynote Speaker
Mr. Matt Ettus
President of Ettus Research, and National Instruments
Distinguished Engineer
0920 – 1200 Matches and Team Presentations
1200 – 1300 Team Expo
1300 – 1700 Matches and Team Presentations

DAY 2 – THURSDAY, MARCH 20, 2014

- 0830 – 0840 Welcome
0840 – 0900 Keynote Speaker
Dr. Henning Schulzrinne
Chief Technologist of the Federal Communications
Commission
0900 – 1200 Matches
1200 – 1300 Team Expo
1300 – 1320 Keynote Speaker
Mr. Howard McDonald
Branch Chief, Advanced Access Initiatives Branch,
Defense Information Systems Agency – Defense
Spectrum Organization
1320 – 1500 Matches
1500 – 1600 Tournament Finals
1600 – 1630 Break
1630 – 1700 Award Ceremony

Meet the Teams

Buzz Radio



Georgia Institute of
Technology

John Krier

I am a Ph.D. student at Georgia Tech studying wireless communications, radar, and computer science. I am interested in the practical application of software-defined radios in managing spectral resources in wide area networks.

Efficient Spectrum

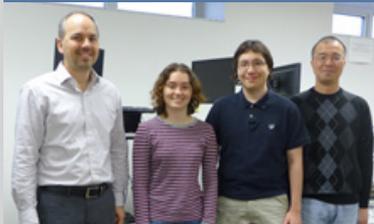


Individual

Roy Thompson (lead)
Mark Chaney

Efficient Spectrum is composed of Roy Thompson and Mark Chaney, and is based in Northern Virginia. Roy and Mark have over 20 years of combined professional experience developing high performance real-time digital signal processing systems, but are participating in the DARPA Spectrum Challenge as individuals with no official affiliation.

Gator Wings



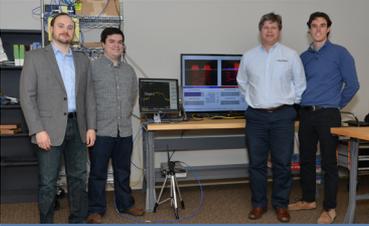
University of Florida

Tan F. Wong (lead)
John M. Shea

Hannah L. Mellott
Benjamin J. Landers

Tan Wong and John Shea are UF professors who have worked together on communications research for 15 years. Ben Landers and Hannah Mellott are M.S. and B.S. students in the ECE department who also work as programmers for a local company. The team enjoys programming radios in their spare time....

GTRI



Georgia Tech Research
Institute

Bob Baxley (lead)
Andy Henshaw
Ethen Trehwhitt
Sean Nowlan

Chris Valenta
Ryan Westafer
Jeff Hodges
Brett Walkenhorst

Team GTRI is a group of research faculty members from the Georgia Tech Research Institute. We represent a diverse set of skills spanning signal processing, communications theory, GNU Radio, and software-define radio. Our Wreck Waveform is a home-grown set of adaptive radio and jamming mechanisms for the GNU Radio framework.

KPE

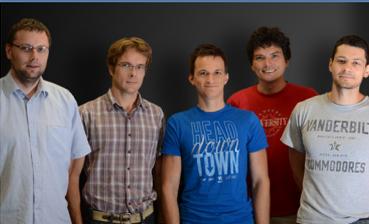


Independent

Kevin Rosenberg, M.D. (lead) Daniel C Appel
Camella Rosenberg Manu T S
Paul Rosenberg

KPE started as the work of Kevin Rosenberg, a practicing triple board-certified physician who continues his lifelong engineering passion as software and embedded hardware consultant. Glad to work with anyone wishing to learn, KPE has had contributions at various times from students with a variety of backgrounds.

MarmotE



Vanderbilt University, ISIS

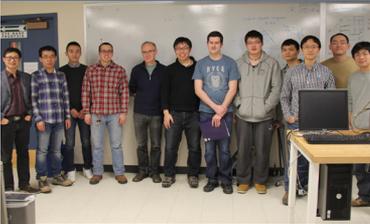
Peter Volgyesi (lead)
Miklos Maroti
Peter Horvath

Sandor Szilvasi
Benjamin Babjak

Team MarmotE was formed at the Institute for Software Integrated Systems, Vanderbilt University by researchers and graduate students with common interest in software-defined radios and spectrum sharing technologies. The goals of the DARPA Spectrum Challenge are well aligned with our ongoing research directions sponsored by the NSF NeTS and CPS programs.

Meet the Teams

Northwestern Wildcats



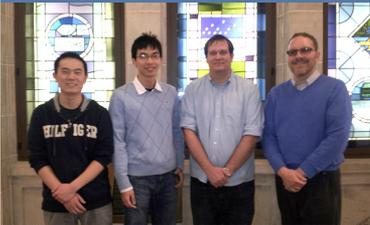
Northwestern University

Dongning Guo (lead)
Xu Chen
Binnan Zhuang
Fei Teng
Ryan Keating
Zhiyi Zhou
Tsung-Yi Chen

Brock Burdyl
Cheng Chen
Mingjun Li
Xu Li
Motoki Mizoguchi
Ben Honig

Team Northwestern Wildcats consists of faculty and students from the EECS Department at Northwestern University and visitors who share the love of Communications and Information Theory as well as wireless technologies. Wireless is fun! Go Wildcats!

Notre Spectrum



University of Notre Dame

J. Nicolas Laneman (lead)
Bertrand Hochwald
Ding Nie

Mingming Cai
Dirk Van Bruggen

Notre Spectrum consists of 5 team members (3 students, 2 faculties) from the University of Notre Dame. We focus on the robustness and simplicity of the wireless transmission strategies that have high throughput.

Orange Wireless Warriors



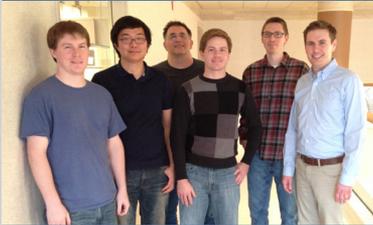
Syracuse University

Biao Chen (lead)
Kapil Borle

Fangfang Zhu
Yu Zhao

The Orange Wireless Warriors is an academic team consisting of three doctoral students, Kapil Borle, Fangfang Zhu, and Yu Zhao, and faculty advisor Biao Chen. They are all affiliated with the Communication Lab in the Department of Electrical Engineering and Computer Science of Syracuse University.

Team Purdue



Purdue University

Andrew Marcum (lead)
Andrew Balmos
Joon Young Kim
Stephen Larew

Alex Layton
Sooyoung Hur
Professor Jim Krogmeier
Professor David Love

Team Purdue is comprised of ECE graduate students and professors. All members are actively researching topics in communications and signal processing. Before the challenge, the USRP had primarily been used for undergraduate research (5+ years). Given skills obtained from the challenge, the USRP will be employed in future graduate research.

Team Spartans



San Jose State University

Ritchie Buenviaje (lead)
Poonam Agale
Anaam Ansari

Prof. Robert
Morelos-Zaragoza
Koushalya Ramakanth
Prof. Birsen Sirkeci

Team Spartans is comprised of two professors and four current and former master's candidate graduate students from the SJSU Electrical Engineering department. By applying their varied expertise to the challenge, each member was instrumental in the design, development, and testing of the team's SDR solution.

Tennessee Tech Telecom

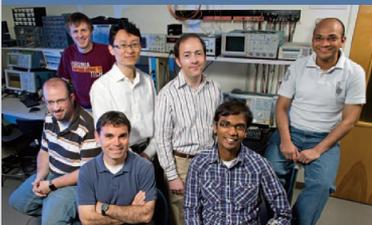


Tennessee Tech University

Dr. Adam L. Anderson (lead)
Brett Witherspoon

Dr. Anderson is an assistant professor at Tennessee Tech University; Brett is an undergraduate student at TTU soon to start in a PhD program somewhere. Both are software-defined radio enthusiasts at both the amateur and academic levels.

VT-CogRad



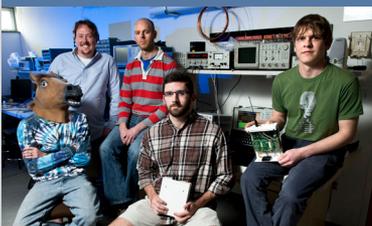
Virginia Polytechnic Institute
& State University

Dr. R. Michael Buehrer
(lead)
Dr. Jung-Min “Jerry” Park
Dhiraj Amuru

Daniel Jakubisin
Vireshwar Kumar
Jeffrey Poston
Jason Snyder

The VTCogRad team comes from Wireless @ Virginia Tech, one of the largest university wireless research groups in the United States. Wireless @ Virginia Tech is recognized for its pioneering work in software defined radio (SDR) and cognitive radio

VT-Hume



Hume Center at Virginia Tech

Dan DePoy (lead)
Dr. Joe Gaeddert
Chris Jennette
Marc Lerch

Dr. Bob McGwier (advisor)
Dr. Charles Clancy (advisor)
Mitch Davis (honorary)

The VT-Hume Spectrum Challenge team consists of current and former graduate students that represent the Virginia Tech Hume Center for National Security and Technology. We are advised by Dr. Bob McGwier and Dr. Charles Clancy.

wasabi



Independent

Marc Newlin (lead)

Marc Newlin is a self-taught hacker from Seattle with a proclivity for learning new technologies and solving difficult problems. The DARPA Spectrum Challenge was his introduction to software defined radio, an expertise he looks forward to developing further. He previously competed in the DARPA Shredder Challenge, finishing in third place.

Wireless Infidels



NYU Polytechnic School of Engineering

Fraida Fund (lead)
Oner Orhan
George Kyriakou

Shivendra Panwar
(Faculty Advisor)

The Wireless Infidels are PhD students in electrical engineering. Fraida's background is in wireless networking testbeds - she operates an ORBIT-like testbed at NYU (on a smaller scale). Oner's research interests include wireless communications, information theory, and energy harvesting. George studies techniques for efficiently sharing a wireless medium.

WSL-NEU



Northeastern University

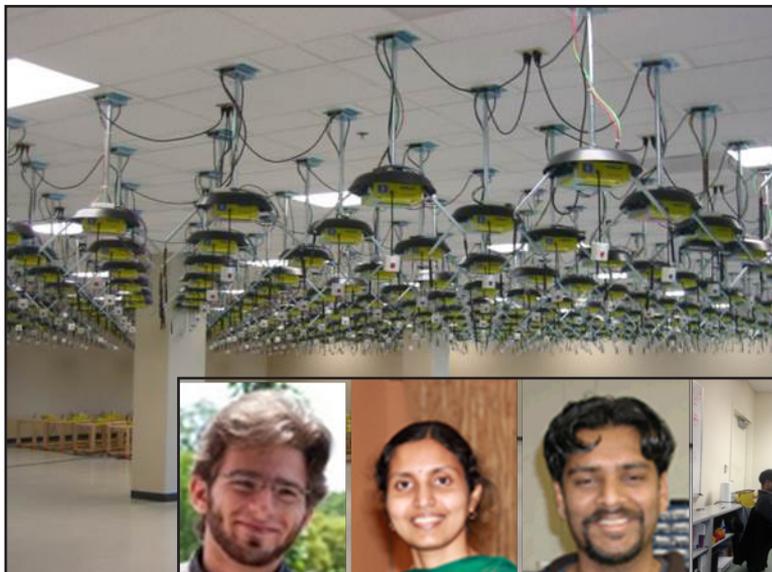
Guevara Noubir (lead)

Bishal Thapa
Triet Dang Vo Huu

The WSL-NEU Team of Northeastern University research focuses on scalable and secure wireless systems. Guevara Noubir a Professor at Northeastern, Bishal Thapa a PhD graduate of NEU currently research scientist at BBN, and Triet Vo Huu a current PhD student have a combined 30 years of expertise in wireless research.



Rutgers Spectrum Challenge Team



Team Members:

Ilya Chigirev
Prasanthi Maddala
Shridatt Sugrim
Nilanjan Paul

Mike Sherman
Chris Rose
Wade Trappe
Ivan Seskar

ORBIT website

<http://www.orbit-lab.org/wiki/DSC#DARPASpectrumChallenge>

Email

challenge@orbit-lab.org

DARPA Spectrum Challenge Team



Team Members:

Kiely Wilkerson

Kevin Barone

Sandy Quantrille

Yiftach Eisenberg

Jon Schepps

Chris Glaze

Esko Jaska (not shown)

Spectrum Challenge Website

<http://dtsn.darpa.mil/spectrumchallenge/Default.aspx>

Email

spectrumchallenge@darpa.mil



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