

RIVERSIDE RESEARCH

wavelengths



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COE Insider

2016 Independent Research and Development & Strategic Initiative Projects

The 2016 project selection process was one of the most competitive in years. Several high-value proposals from across the enterprise totaling over \$10M in potential investment opportunities were received. This led the Investment Review Board to evaluate each respective proposal very carefully. The Board determined that the three following projects would best align with Riverside Research’s corporate strategies and the high probability of scientific/engineering impact.

Riverside Research is pleased to offer these new capabilities as they will have an immediate impact on current development efforts and will foster future advancements and collaborations.

Owning the Technical Baseline
Prototype and development of tools to minimize the total cost of ownership and maximize performance of legacy sensors

Advanced Plasma Research
Development and experimentation of plasma-based propellants, thrusters, and metamaterials

Neuromorphic Computing for Energy Efficient Agile Air Force Platforms
Research methods to enable on-platform intelligent decision making/sensor perception through multi-sensor/Multi-INT data and information fusion

2015 IRAD & SI Project Outcomes and Summaries
In the next few Wavelengths issues, we will be including brief summaries of the 2015 IRAD & SI projects. Each issue will focus on an IRAD & SI project and its respective COE.

2015 IRAD & SI Projects	COE	Wavelengths Issue
Quantitative Ultrasound (QUS) analysis of Exact Imaging Data	Biomed	March
QUS and Quantitative Photoacoustics (QPA) in Dense Stochastic Media and Self-normalizing Hybrid QUS-QPA in Soft Tissues	Biomed	March
Advanced Defense Optical Systems (ADOS) Initiative	EM	April
Adaptive laser Systems for Medical and Defense Applications	EM	April
Plasma Lab Strategic Initiative	EM	April
Computer Network Monitoring Advanced Concept Technology Demonstrator (ACTD)	Cyber	May
Critical Infrastructure Protection ACTD	Cyber	May
Cyber Effects on UAVs ACTD	Cyber	May
Adaptation of Neurosynaptic Cognitive Computing Technology for ISR Applications	ISR	June
iMMERSE NP (Next Phase)	ISR	June
Sustainment Forecast Modeler	ISR	June
eVision	ISR	June

Biomed COE

2015 IRAD & SI Outcomes and Summaries

Quantitative Ultrasound Analysis of Exact Imaging Data



Imaging of prostate cancer (PCa) cannot be done reliably by any current clinical method. Magnetic-Resonance-Imaging (MRI) methods provide the best imaging of PCa, but it is still prone to error, very expensive, time consuming, and is often poorly tolerated by patients. The methods of tissue typing Riverside Research has developed—using quantitative ultrasound (QUS) for analyzing ultrasound echo signals—offer promise for providing great improvements in imaging PCa, and it can be performed at a low cost in brief, non-invasive examinations that are well-tolerated by patients. Combined with the ground-breaking, high-frequency, ultrasonic, prostate-imaging technology developed by Exact Imaging, a significant breakthrough in prostate imaging seems possible.

This IRAD & SI project utilized high-frequency ultrasound data and matching histologically determined tissue-type data acquired from trans-rectal needle biopsies performed to detect and grade PCa. These biopsies are being performed in clinical trials seeking FDA approval for marketing and selling the Exact Imaging prostate scanner in the US. This project is specific to PCa and will benefit the approximately one million men in the US who are candidates for prostate biopsies each year.

To learn more about this project, contact **Dr. Ernest Feleppa**, Director, Biomed and Biomed COE Chair, efeleppa@riversideresearch.org.

QUS and Quantitative Photoacoustics in Dense Stochastic Media and Self-normalizing Hybrid QUS-QPA in Soft Tissues

QUS in dense media is a new research field and scientists are beginning to understand the theoretical implications as well as the clinical implications. A better understanding of QUS in dense tissue could pave the way toward better tissue-typing tools using non-invasive ultrasound and could therefore advance diagnostics ultrasound significantly. QPA in dense media has never been studied or modeled. This IRAD & SI project permitted the Biomed COE to begin researching this theoretical investigation.

Development of forward and inverse theoretical QUS models were completed and successfully applied to experimental and simulated data. QPA and hybrid QUS-QPA theoretical models were developed. The first step is to test the dense QUS models on experimental human data such as those we collect from dissected human lymph nodes. Current lymph-node methods use classical (i.e., sparse-scatterer) models and may prove to be inaccurate compared to our new models for dense media. Therefore, our new dense QUS models potentially can improve our ability to detect small, but clinically important, cancerous regions in lymph nodes. The next step, which could be performed simultaneously with the first step, would be to test the QPA and hybrid QUS-QPA approaches in appropriate dense tissue-mimicking phantoms.

To learn more about this project, contact **Dr. Jonathan Mamou** (Biomed), jmamou@riversideresearch.org.

COE



IT



ISR COE

Technical Workshop Featuring Hewlett-Packard's CogX Cognitive Computing Platform

The ISR COE hosted a technical workshop featuring Hewlett-Packard's (HP) CogX Sense-making Research Initiative on 26 February at the Dayton Research Center (DRC). CogX is a research effort at HP Laboratories to create a generalized framework for running machine-learning algorithms as well as convolutional deep neural networks in multiple GPU environments without substantial developer involvement. The research platform enables sophisticated reasoning, learning, and adaptation inspired by the principles of human cognition.

Attendees from the National Air and Space Intelligence Center (NASIC), Air Force Institute of Technology (AFIT), Air Force Research Lab (AFRL), and the University of Dayton (UD) learned why CogX research matters to the Intelligence Community (IC) and how this research is undergoing proof-of-concept demonstrations in Advanced Sciences and Technologies (AS&T) offices throughout the IC.

9th Annual Military Radar Summit



Peter Beer

On 29 February–2 March, Director of Technology Development, R&D, **Peter Beer** and **Farhaan Razi** (RAD) attended and presented at the 9th Annual Military Radar Summit in Arlington, VA. The annual summit brought together industry and government agencies to collaborate and discuss recent advances and challenges in the radar field.

Peter and Farhaan presented “Minimizing Total Cost of Ownership and Maximizing Systems Performance in Legacy Systems,” a topic that led into one of the 2016 Riverside Research IRAD & SI projects, “Owning the Technical Baseline.” The problem is quite significant, and there are several obstacles to overcome when resolving it. Riverside Research’s IRAD & SI initiative is providing a solution by using big data architectures and frameworks. The big data framework is used to reduce processing times and extract additional insights from the various data sources not previously apparent. The IRAD & SI team developed tools to assess the functional, design, and performance baselines of a system to determine the understanding of the technical baseline. In addition, the team combined the relationships between the areas to provide predictive analytics of key performance parameters important to the sensor stakeholders. Name the 2016 IRAD & SI projects. Submit your answer here.



Farhaan Razi

“The ability to understand and own the technical baseline is critical to solving this problem. It will provide the necessary tools and data to the stakeholders to minimize total cost of ownership while maximizing system performance.”
—**Farhaan Razi** (RAD)

EM COE

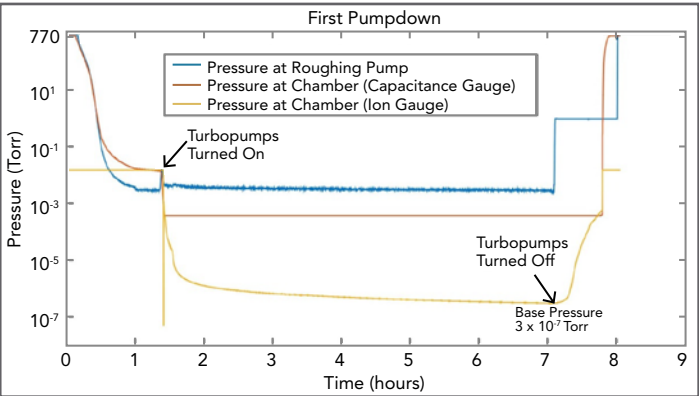
Plasma Research Team Conducts Successful Performance Acceptance Test on Plasma Vacuum Chamber

The plasma research team performed acceptance testing on the large plasma vacuum chamber recently installed in the Riverside Research Open Innovation Center (OIC).

The operational vacuum test was conducted over the course of eight hours, and the chamber ultimately achieved a base pressure of 3.1×10^{-7} Torr, which is one billion times lower than the standard atmospheric pressure that surrounds us on a typical day. This pressure corresponds to an altitude of approximately 200 miles above sea level, which is midway between the 100-300 mile altitudes low earth orbit satellites typically fly. The graph below provides details of the successful vacuum test.



Plasma Chamber



Pressure Log of the Test

“This new capability enables Riverside Research to perform advanced research and development in plasma physics and space applications. It will support ionospheric and space plasma environments, hypersonic plasma environments, space propulsion, plasma-magnetic field interactions, dusty plasmas, and plasma-based material processing applications.”
—**Dr. Jeffrey Pursel**, Director, Open Innovation Center & Electromagnetics Research



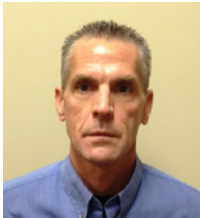
Employee News

February New Hires

ARS



Stacey Davis
Dayton, OH
Project Support
AFIT/LS



Jeff Dixon
Dayton, OH
Data Researcher



Pat Lichtenberger
Colorado Springs, CO
Senior Systems
Administrator



Kelly Skinner
Dayton, OH
Information Systems
Engineer

IDS



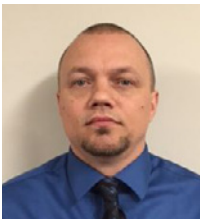
Brian Bacher
Dayton, OH
Software Engineer



Kaushal Dhar
Centreville, VA
Remote Sensing Analyst



Julia Stadel
Centreville, VA
Software Developer



Bob Decker
Dayton, OH
Facility Manager

MAD

PGM

Employment Tenure Milestones

10 Years



John Mitchell
Patrick AFB, FL
Member of the
Research Staff
RAD
Start Date: 02.01.2006



Klaes Wandland
Dayton, OH
Member of the
Research Staff
IDS
Start Date: 02.22.2006

5 Years



Tiffany Flannery
Dayton, OH
Program Manager
ESS
Start Date: 02.03.2011



Rusty Hammer
Dayton, OH
MASINT Systems
Engineer
IDS
Start Date: 02.28.2011



Steve Yantko
Dayton, OH
Member of the
Research Staff
BD
Start Date: 02.14.2011

Honors & Awards



L to R: Mike Gauder and Mike Nelson

Mike Nelson, Director, IDS, presented **Mike Gauder** (IDS) with a Quarterly Performance Award for his expert services as a project manager and technical SME in support of the Remote Data Review Station (RDRS) project and outstanding support of GSM's Global Sensor Integration on Networks (GSIN) initiative. Mr. Gauder's relentless focus, impeccable composure, and ability to communicate effectively with both technical analysts and leadership are instrumental to the success of these initiatives.



L to R: Ben Gnau and Mike Nelson

Mike Nelson also presented **Ben Gnau** (IDS) with a Quarterly Performance Award for his excellent technical leadership of the delivery of the OPIR exploitation tool suite Palette 9.4.1. With Mr. Gnau's guidance, total team attitude, and interactive communication, the project was delivered with zero defects as well as an improved process for tracking and managing product features and needs.

On 1 February **Jerry Do Vale**, Director, RAD, awarded **Brian O'Connor** (Contracts), **Amy Karnehm** (Finance), and **Tim Ramsey** (HR) with Quarterly Performance Awards for their commitment to the Radar Assessment and Development team in expanding and retaining all of their programs for 2015.

Brian was recognized for his outstanding contracts and proposal support and commitment. Amy was recognized for her outstanding finance and proposal support and commitment. Tim was recognized for his outstanding accomplishments in recruiting and commitment.



L to R: Irene Smith, Director of Contracts; Brian O'Connor; and VP for R&D Dr. Frank Falco



L to R: Jerry Do Vale, Amy Karnehm, and Sumit Patel (Finance)



L to R: Jerry Do Vale and Tim Ramsey

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L to R: Mike Nelson, Director IDS; Deb Montanaro; VP for Programs Joel Rieman

Deb Montanaro (IDS), **Marilyn Camacho** (Contracts), **Mallory Jahn** (Finance), **Chandra Singh** (Contracts), and **Rita Kalsi** (Finance) were awarded Impact Awards on 29 February for their contributions as part of the NASIC Contract Closeout Team. They worked diligently for more than two years to eliminate the backlog in NASIC Task Order closeouts, and established a robust process to assure prompt future Task Order closeouts. The Team's efforts have resulted in a system that routinely closes out Task Orders in less than 60 days—a model for DOD Intelligence Community acquisition.



L to R: Mike Nelson, Marilyn Camacho, and Joel Rieman



L to R: Irene Smith, Director of Contracts; Chandra Singh; Mike Cade, CFO; Rita Kalsi; and Nancy Kenney, Corporate Controller



L to R: Mike Nelson, Mallory Jahn, and Joel Rieman

AFRL's Avionics Cyber Mitigations and Protections Team Receives Director's Cup Team Award 2015

The Avionics Cyber Mitigations and Protections Team, Sensors Directorate, Air Force Research Laboratory (AFRL) received the Director's Cup Team Award 2015 for their outstanding efforts. The Team is comprised of Riverside Research ESS personnel **Brian Krumheuer**, **Ben Ausdenmoore**, **David Dozer**, **Adam Kouse**, **Brad Hagan**, and **Scott McLaughlin**, government team members, and personnel from various government contracting companies.



L to R: Brian Krumheuer, Ben Ausdenmoore, David Dozer, Adam Kouse, Brad Hagan, and Scott McLaughlin

You can submit content for the newsletter to wavelengths@riversideresearch.org

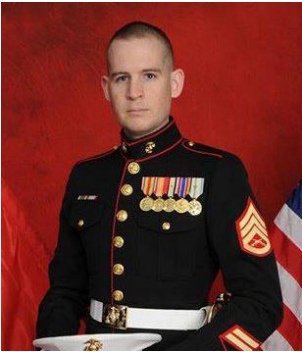
AFRL's MESA Team Receives the 2015 Air Force Research Laboratory Classified Program Management Team of the Year Award

Mark Brant, **Scott McLaughlin**, **Dr. Stephen Wraizen**, **Robert Groves**, **Michael Rettig**, and **Kevin Jones-Evans**, AFRL Microelectronics and Embedded Systems Assurance(MESA), were presented with the 2015 Air Force Research Laboratory Classified Program Management Team of the Year Award for their expertise, enthusiasm, dedication, and contribution to making AFRL an outstanding organization.



L to R: Mark Brant, Scott McLaughlin, Stephen Wraizen, Robert Groves, Michael Rettig, and Kevin Jones-Evans

Professional Achievement



GySgt Sam Bolling

Sam Bolling (EMG) was selected for promotion to Gunnery Sergeant in the United States Marine Corps (USMC) Reserves. While serving in the USMC Reserves, Sam is a Staff Non-Commissioned Officer in charge of the Production & Analysis Detachment of 17 Marines based in Quantico, VA. He is responsible for their training and readiness and oversees their support to the missions of both the Marine Corps Intelligence Activity Enterprise Operation Center and Geospatial Intelligence Division. At Riverside Research, Sam serves as the Measurement and Signature Intelligence (MASINT) Functional Team Lead.

Congratulations on your promotion, GySgt Bolling!

Personal Accomplishment

On 17 February, **Richard Wallace** (EMG) successfully defended his doctorate dissertation “*Application Execution Optimization in Heterogeneous, High-Performance Computing Environments*” at Complutense University in Madrid, Spain, passing Summa Cum Laude for a doctorate in Computer Architecture. Due to various exterior challenges and obstacles, Richard has been working on his doctorate for over 26 years. “I’d been bucked off three times before I could make my eight seconds, but by the good Lord, I kept right on getting back on that horse,” said Richard.

Congratulations, Dr. Wallace! Your personal dedication and ambition paid off.



Dr. Wallace and his sister, Julie at the Royal Holloway in London

Family News

On 11 March **Jake Schierloh** (HR) climbed 14,114 feet to propose to his girlfriend, Gigi Mocker. Popping the question at the summit of Pikes Peak will surely inspire your significant other to say, “Yes!”

With Jake and Gigi’s spontaneous personalities and both of their families in town, 29 March was the perfect date for a spur-of-the-moment wedding!

Congratulations on your wedding Mr. and Mrs. Schierloh.



Jake Schierloh and Gigi Mocker at the summit of Pikes Peak



Gigi and Jake Schierloh during their wedding ceremony

Celebrations

CRO Celebrates National Chili Day

Every month the Centreville Research Office (CRO) celebrates a “National __” day. National Chili Day was celebrated on 25 February. CRO enjoyed a delicious lunchtime chili cook-off with four chili contestants: **John Ploschnitznig** “JP” Director, Modeling and Application Development; **Ray Howell** (MAD); **Eric Lawson** (MAD); and reigning champ, **Chris Cunningham** (MAD). Everyone had a chance to cast their vote for their favorite chili. It was a tough call, but after tallying the votes, it was revealed that Eric Lawson took over this year with his award-winning vegetarian chili. Congratulations on the triumphant win to all the veggivores! Thanks to all who participated by bringing in chili, chips, and toppings.



Eric Lawson, winner of the chili cook-off



Michelle Dawson, Chirag Patel, Ryan McEvoy, Kaylee Oh, and Christopher Cunningham enjoying the Chili

Travel

Rental Car Travel Reminders

Due to a recent dispute between an employee and a rental car agency, a few rental car reminders are listed below:

- Rental cars should always be re-fueled before returning to the rental agency
- Riverside Research does not reimburse the fuel purchase option

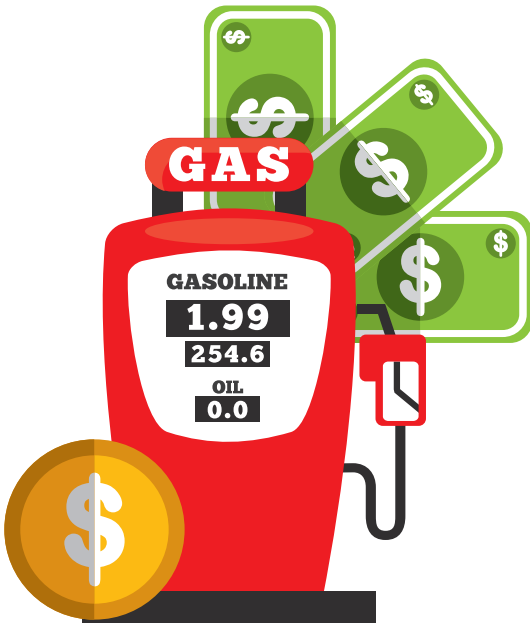
An employee recently rented a car from Avis and was given inaccurate re-fueling information by the rental car agent. This caused a dispute of fuel charges.

When the employee arrived at Avis to pick up the rental car, the agent informed the employee that if the car was driven less than 75 miles, the traveler did not need to fill up the gas tank before returning the car. The employee drove less than 75 miles, therefore did not fill up the gas tank. As a result, over \$13 was added to the bill.

The employee is disputing the additional charge, citing the Riverside Research prohibition of using a fuel purchase option as the reason why they won’t accept the \$13 charge. Generally, the fuel purchase option and fee are agreed to at the time of rental. The fuel purchase option can range up to \$70.

To avoid future disputes, employees should always fill up the gas tank before returning the car, no matter how many miles were driven or the instructions provided by the rental agency.

Please contact **Dave Junkins** if you have questions or need further information: djunkins@riversideresearch.org; 212.502.1741



Timecard Tips

Please find the helpful timecard tips below to ensure all employees are timecard compliant:

- Complete your timecard daily, but no later than 10:00 AM the following working day.
- Only enter job codes for those you are charging. Do not automatically enter potential job codes when you start a new timecard.
- If you enter a job code, but do not have any hours for it by at the end of the two-week period, please remove that job code from your current timecard.
- The horizontal job code lines reflect the jobs for the two-week timecard period. As a reminder, you do not have to charge hours to job codes during both weeks, but at least one week should have hours charged to each job code.

If you have timecard questions or need further assistance, please submit a ticket to jamis@riversideresearch.org.

COE



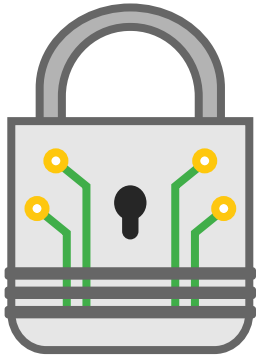
IT



IT

How Much is Our Data Worth?

Hackers recently struck Hollywood Presbyterian Medical Center, but they didn't steal anything. Instead, they performed a virtual-kidnapping by encrypting files critical to running the hospital's information technology systems. The kidnapping impacted patient care in the form of missed appointments, delayed lab testing, and created a chaotic environment for the medical staff. And then they asked for money. After three weeks of operating without crucial computer programs, the hospital called in digital forensics experts to find a solution to the problem and release the files. In the end and at the recommendation of the FBI, the Los Angeles hospital paid a \$17,000 ransom to restore its systems. It is estimated that loss of productivity and resources due to a cyber-attack costs a medium-sized company \$21K per hour in evaluation and restoration efforts. In this case, the \$17K was a small price to pay to regain normal operations.



Consumer computers running commercial software continue to be frequent targets for ransomware. While it's long-been presumed that Apple computers were relatively immune to external threats, the news broke recently of the first ransomware targeting Macs, increasing the targeted environment and demonstrating the continued evolution of sophistication. Because only a fraction of ransomware attacks are reported to federal authorities, it's hard to say exactly how big the problem is, but the one certainty is that it's growing. The extortionists writing this code are getting more creative and sophisticated, and a crop of frightening ransomware tools with names like Locky and CryptoWall have plagued businesses and consumers alike over the past year. It's become the hottest hacking trend to date in 2016.

Locky, a new family of ransomware that recently emerged in the last few weeks has quickly made a mark for itself, accounting for an estimated 16.5% of the over 18 million attacks collected. Computer security companies say it has become the most common type of ransomware being distributed through spam messages that typically have either Office macros or Javascript attachments. The Riverside Research IT team is investigating the methodology used to deploy ransomware and devising countermeasures to prevent its intrusion into our corporate network. We're accomplishing that by identifying internal users of macros and Javascript, with the intention to then create an environment in which those applications can be safely executed.

Our employees are our biggest asset in the fight against cybercrime. Being vigilant about the cyber environment both at home and at work, scrutinizing emails more closely, and reporting suspicious email activity makes you the front line of defense in our fight against becoming a victim of cyber-vandalism. Employing good security practices in all aspects of electronic communications will hone your skills and heighten your awareness toward the daily threats lurking in cyberspace.



Enterprise News

Riverside Research Board of Trustees Welcomes Mr. Theodore York



Theodore York

Mr. Theodore York was elected to the Riverside Research Board of Trustees effective 1 March. Mr. York has many years of leadership experience, primarily in the electrical components and equipment industry. He was the former President of the Burndy Corporation, Executive Vice President of Framatome Connectors International, and President of Saber Equipment Corporation.

Visit the Riverside Research website to read the full [press release](#) about Mr. York and/or his [biography](#).

A Warm Welcome to Dr. Steven Omick, New President and Chief Executive Officer



Dr. Steven Omick

Dr. Steven Omick has been appointed as the new Riverside Research President and Chief Executive Officer. Dr. Omick brings over 28 years of research and executive leadership experience within the private sector in addition to the defense and intelligence industry.

Prior to joining Riverside Research, Dr. Omick was the President of Applied Communications Sciences (ACS), a leading provider of research in cyber security, advanced networking, data analytics, machine learning, mobility, and radio frequency communications. Preceding ACS, Dr. Omick was the President and CEO of Rincon Research Corporation, a leading provider of digital signal processing products and engineering services for the US Government Intelligence Community.

Visit the Riverside Research website to read the full [press release](#) about Dr. Steven Omick.

"Dr. Omick brings a wealth of knowledge that will facilitate his seamless transition to Riverside Research. We are confident his technical acumen and business background will serve him well as he leads the company on its successful path into the future."
—Thomas Pitts, [Riverside Research Chairman of the Board](#)



Don't know how to submit your Wavelengths news? There are now multiple ways to ensure your news is published in Wavelengths. Anyone can submit content to the Wavelengths team at wavelengths@riversideresearch.org. All content is subject to the approval of your supervisor and the Office of the President. You can also submit based on the information below:

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Quiet Contest

All enterprise employees have the opportunity to win branded items or a restaurant gift card by searching for the hidden question within this issue. Send your answer to: wavelengths@riversideresearch.org.

Congratulations, **Curtis Neiderer** (RAD)! Curtis was the February Quiet Contest winner.

February Question:
Riverside Research recently converted to a new Information Technology Service Management (ITSM) tool. What is the name of the tool?

February Answer:
During the month of February, Riverside Research converted from a previous helpdesk tool to Footprints Service Core, an Information Technology Service Management (ITSM) tool from BMC.



Curtis Neiderer

Guide to Common Enterprise Acronyms

AIR	Airborne Reconnaissance Systems Directorate
ARS	Applied Research Solutions
Biomed	Biomedical Engineering
BOT	Board of Trustees
COE	Center of Excellence
Cyber	Cyber Research
EM	Electromagnetics
EMG	Emerging Programs & Support Directorate
ESS	Engineering & Support Solutions Directorate
IDS	Intelligence & Defense Solutions Directorate
IRAD & SI	Independent Research and Development & Strategic Initiative
ISR	Intelligence, Surveillance, and Reconnaissance
MAD	Modeling & Application Development
PGM	Programs
OTP	Office of the President
RAD	Radar Assessment & Development
R&D	Research & Development



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