



UNLEASH THE POWER OF THE CLOUD DELIVERING ENTERPRISE CAPABILITY TO THE EDGE

MULTI-INT

GEOINT

IMINT

SIGINT

HUMINT

COMINT

With General Dynamics' open cloud architecture, all users, whether remote or collocated with their data and applications, have direct access to the power of the enterprise, including remote exploitation, multi-INT data integration, intelligence and resource management, and real-time motion imagery processing.

Our open cloud architecture enables remote access to mission critical data and applications from a consolidated, shared environment.

GENERAL DYNAMICS Advanced Information Systems

trajectory
2013 ISSUE 1

□ VANTAGE POINT

New themes for 2013 and flexibility in pursuit of excellence.

⊹ | LETTERS

In this issue of *trajectory*, readers offer feedback.

□ INTSIDER

GPS without satellites; industry acquistion; new software.

□ IN MOTION

USGIF working group and workshop updates; *trajectory* wins a Pearl award.

i 🗄 | ELEVATE

UT Dallas' GIS program offers a well-rounded approach to GEOINT.

FESTURES

1 → LOCATION NATION

Mobile GEOINT has changed the way the world thinks about and interacts with place.

By Matt Alderton

UNCONVENTIONAL WEAPONS

We sit down with Jeff "Skunk" Baxter as he tells us how he became a rock star (of defense intelligence).

GEOINT analyst training embraces new technology while maintaining sight of the basics.

By Kristin Quinn

SPECIAL SECTION

33 USGIF MEMBERSHIP DIRECTORY

□ □ | MEMBERSHIP PULSE

L-3 STRATIS drives transformation through innovation.

SS | GEN YPG

Young professionals develop apps for Booz Allen Hamilton, DigitalGlobe, and Tomnod.

■7 | NEED TO KNOW

An introduction to radar imaging by Thomas Ager.

== | HORIZONS

Reading List, Peer Intel, and USGIF Events Calendar.

○○ | APERTURE

The Livehoods project maps and studies city dynamics through social media analysis.

Cover image provided by Maponics. This composite design shows various neighborhoods in San Mateo, Calif., overlaid with Maponics Neighborhood Boundaries. It illustrates the characterization of geofences and other relevant geographies.

TRAJECTORYMAGAZINE.COM



VIDEO
Skunk Baxter plays
"America the Beautiful" at GEOINT 2009.



PODCASTThe National Academy of
Sciences reports on the
future GEOINT workforce.



DOWNLOAD

The digital version of the 2013 USGIF Membership Directory includes a capabilities index.

UNNTAGE POINT

NEW THEMES IN 2013

During a recent trip to England to visit with intelligence leaders from the Ministry of Defence (as well as with U.S. analysts from EUCOM, AFRICOM, and NATO at JAC Molesworth), I was pleased to see copies of *trajectory* at various locations. I also heard from colleagues that topics



like activity-based intelligence (ABI) were being discussed using articles from our magazine as a starting point. Establishing trajectory as a platform to stimulate discussion and foster thought leadership was one of our goals when we launched the publication last year, and it is heartening to see this mission already becoming reality.

In that regard, there are a number of important themes in this issue. The first, our cover story, explores the transformation of location-based services (LBS) facilitated by: the confluence of the ubiquity of precision navigation; the hyper-availability of geospatial information; the increasing sophistication of software to produce and exploit this information; the advent of the computing power to do so quickly; and the acceleration of mobile

computing capabilities. The result is a revolution in the LBS world, or at least an evolution at warp speed. There are important implications here for the defense, intelligence, and homeland security communities, and indeed, the whole of government.

Even a cursory understanding of the impact of emerging technologies like those associated with LBS, and innovative methodologies such as ABI, make it evident that traditional approaches to analyst training need to be revisited. Such discussions are taking place around our collective

communities, and one of our feature stories touches on some of the fundamental pieces of this dialogue. I'm hopeful this article will encourage more serious examination of this topic, as it is critically important to the future of our tradecraft.

Finally, we're thrilled to be getting feedback about our efforts with trajectory. We've shared two responses to the magazine in a new "Letters" department, and we're eager to hear from more readers

Establishing trajectory as a platform to stimulate discussion and foster thought leadership was one of our goals when we launched the publication last year, and it is heartening to see this mission already becoming reality.

and to publish their thoughts for broader consideration.

Another piece of feedback we've received is a desire for more technical information in the magazine. In response, we've added a "Need to Know" department beginning with this issue. This space will provide a brief tutorial on technical aspects of our business, aimed at providing a basic level of understanding to the average reader. We look forward to your suggestions for this new section.

We're having fun with *trajectory*, and enjoying the flexibility to be responsive to suggestions from readers. We're proud of what we've been able to accomplish thus far. Please continue to let us know how we can keep working to make this magazine even better in the future.

> KEITH J. MASBACK | PRESIDENT, USGIF 闰 @geointer

trajectory

USGIF CEO & CHAIRMAN K. Stuart Shea

> PUBLISHER Keith J. Masback

EXECUTIVE EDITOR Jordan Fuhr jordan.fuhr@usgif.org

MANAGING EDITOR Kristin Quinn kristin.quinn@usgif.org

EDITOR Brad Causev bcausey@glcomm.com

ART DIRECTOR Gretchen Kirchner Rund grund@glcomm.com

> AD SALES Jeff Lev jeff.ley@usgif.org

EDITORIAL INTERN Lindsay Tilton lindsay.tilton@usgif.org



Trajectory is the official magazine of the United States Geospatial Intelligence Foundation (USGIF), in Herndon, Va.

HOW TO REACH US

LETTERS AND COMMENTS For comments on trajectory, contact trajectory@usgif.org.

SUBSCRIPTIONS For information on subscribing to trajectory, please sign up online at trajectorymagazine.com.

USGIF MEMBERSHIP For more information on USGIF or becoming a USGIF member, contact 888-MY-USGIF (888-698-7443).

> WEBSITE trajectorymagazine.com

> > **TWITTER** @trajectorymag

PUBLICATION MANAGEMENT



800-641-3912 | GLCOMM.COM



Enabling a safer world

For over 60 years, Cubic has been a component of national security for the United States and its allies. Our company develops the cross-domain information-sharing, system architecture and security solutions that are critical in today's intelligence and homeland security operations. Cubic's XD-10G, validated by the Unified Cross Domain Management Office, is just one example of the products we are creating to allow our customers to retain technological superiority and ensure the integrity of their data, including streaming video. Cubic designs, innovates, manufactures and fields a wide array of technologies for combat readiness, supply chain logistics and national security for the U.S. and allied nations. To learn more about our XD Solutions and other products, go to www.cubic.com/XD-solutions.





KEEPING IN TOUCH

I just finished reading the new trajectory. Like all USGIF communications, this issue educates, informs, and serves as an attractive "info exchange" for any GEOINT professional. And it does so with more excellence and quality than any other publication. But I just wanted to mention another service trajectory provides, at least to the small portion of the readership who, like myself, are now retired from "active service" in the profession. Trajectory provides an important social-level link between us and our still-cleared brethren in government and industry. And in that regard, the winter issue was a treasure, to me at least. Trajectory keeps us in touch with old colleagues, customers, and friends. So thanks for the great magazine that keeps this old photo interpreter informed on 21st-century technologies and practices, while remaining in touch with people from the 20th.

> —Dan Sibbet Haymarket, VA

CLARIFYING TERMS

I read the trajectory article on human geography and thought it missed the mark on its potential and could benefit from some clarification. As of late there is a lot of nuance and confusion with the term "human geography." In recent vears, terms such as sociocultural analysis, human terrain, social science,

and human geography are sometimes misused or used synonymously. To note, the article uses all of these terms with minimal clarification. This adds a level of confusion. There can be tension between the academic and applied communities when there is modification/adoption/misrepresentation of terms that are not communicated effectively. While the applied community is largely struggling with the nuances, we are getting closer to consensus. The academic community struggles with this as well. Conversations in both emphasize foundations, theoretic grounding, and spatial thinking. We move forward with, what I hope will continue, the geospatial revolution resurgence. Understanding the complexities and intricacies of human behavior is a part of success in the geospatial revolution and our general decision-making.

For clarification, the academic community has a longstanding field of "human geography" distinguishing itself from "physical geography." Human geography studies phenomena such as political or cultural structures as they relate to geography. Human geography and its sub-disciplines are the spatial components of many social science disciplines with their

own theories, methodologies, and applications (i.e., human geography contains cultural geography, economic geography, feminist geography, and so on). Human geography classes are taught at many leading universities. There is an increasing cadre of individuals who are taught foundational geography, as there is a clear path to employment when someone has an understanding of geography and Geospatial Information Systems (GIS). Human geography academic research is critical to producing grounded theory that goes beyond a doctoral dissertation. The field is not simply about providing an answer; it's about deriving analytic and theoretical processes for understanding cultural phenomena in this world.

There is not one lead federal agency for human geography, rather, similar to the academic sub-disciplines, many agencies have human geographers and human geography components within. The World Wide Human Geography Data Working Group is one forum, as well as the American Association of Geographers, that brings these individuals together.

We have a long way to go, but at the minimum, people are talking and seeking to understand the role and opportunity for human geography. There are often missed connections between academia and the applied communities, but there are some who work in both communities that I encourage to be ambassadors. I appreciate that the USG, DoD, IC, USGIF, and trajectory are bringing light and fostering dialogue.



We are certainly having many lively discussions! I truly believe this keeps us positively challenging the domain and I hope this current generation delivers grounded change that will become a foundation for future decision makers.

-Elizabeth Lyon Geographer, U.S. Army Corps of Engineers, Engineer Research and Development Center, Topographic **Engineering Center**



SUBMISSIONS

Trajectory welcomes your feedback. Send us a letter at trajectory@usgif.org. Submission constitutes permission to reprint, and letters may be edited for length and clarity.



THE VALUE OF
CHANGING OPEN
SOURCE DATA
INTO ACTIONABLE
INTELLIGENCE.

Knowledge is power—and our innovative open source intelligence collection and exploitation tools help analysts uncover relationships, discover trends, and visualize scenarios. With our expertise, OSINT merges with other intelligence data to alert end users of potential crises, conflicts, and social trends without having to sort through terabytes of raw data. This allows users to focus on the mission at hand instead of data mining. *That's why we're a leader in mission readiness solutions*.

THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN





OCATA transmitter for USAF, White Sands Missile Range.

POSITIONING WITHOUT GPS

USAF purchases ground-based system

Locata Corp. announced the U.S. Air Force selected the company to install the U.S. military's first ground-based LocataNet positioning system at White Sands Missile Range, N.M. The USAF will field Locata's new technology to supply "reference truth" positioning across a vast area of White Sands when GPS is being jammed. According to Locata, this is the only technology in the world that can perform this task.

In a recent USAF technical report, the need for a new non-GPS-based positioning capability was described by the 746th Test Squadron as a key component for the increasingly demanding test and evaluation of future navigation systems for the DoD.

Locata makes it possible for nations, communities, organizations, or companies to deploy their own positioning system-what the company calls "Your Own GPS." The invention also enables locally controlled hot spots to fill in areas where GPS is unreliable or completely unavailable, such as indoors.



APP TEACHES KIDS **GEOGRAPHY**

Spinlight Studio released its latest app, Geography Drive USA, a game designed to teach kids about the 50 U.S. states. In the game, players "drive" across the U.S., answering questions about each state, including capitals, state shapes, state nicknames, postal abbreviations, state flags, rivers, mountains, parks, time zones, historical events, and more. The app is intended for children ages five to 10 years old, and is available for \$4.99 via the Apple App Store.

geoint? got geoint? got geoint? got geoint? got geoint? got geoint? got geoint?



percent of cell phone owners have a smartphone



percent of smartphone owners use geosocial services

NEW GIS APPLICATION

Software enables users to create, edit, and visualize GIS data via Google Earth

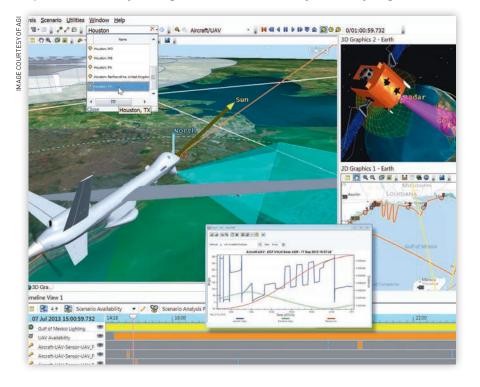
SAIC released its GRGlobe application, a new commercial software to create, edit, and visualize GIS data natively in a Google Earth environment. GRGlobe enables the visualization of spatial data by structuring it into organized layers and overlaying the feature data on a Google Earth globe. GRGlobe provides structure to data to enable GIS functionality for use in government, defense, emergency response, law enforcement, energy, environmental, utility, education, land management, forestry, and more.

Many GIS workflows have been available for years via SAIC's GeoRover software. SAIC re-factored these tools with GRGlobe to offer the same capability in the popular Google Earth environment and provide users with simple tools to generate timely, accurate, and relevant geospatial information. These tools support common coordinate formats, enable users to import from coordinates to visualize this information, and create products from layers and attribute data into popular briefing and GIS formats.

AGI RELEASES STK VERSION 10

Software gets new name and 3D visualization

AGI's Systems Tool Kit (formerly Satellite Tool Kit) version 10 is now available. With this release, AGI has changed the product name to better reflect the software's ability to model, analyze, and visualize complex land, sea, air, and space-based systems. STK's 3D visualization feature is also now available in the free version. STK uses the actual time standard as the foundation for its 3D visualization. This allows users to view systems in simulated historical time, simulated future time, or in real time, with assets updating based on real global conditions. STK 10 was also enhanced to provide broader applicability, with new features pertaining to data, customization, and parallel computing.



ACQUISITION

LOCKHEED ACQUIRES CHANDLER/MAY



Lockheed Martin recently announced the acquisition of UAV manufacturer Chandler/May Inc. However, terms of the agreement remained undisclosed. Chandler/May, with facilities in Alabama and California, will become part of Lockheed's Mission Systems & Sensors business. This acquisition will help Lockheed expand its expertise in the design, development, integration, manufacturing, and support of UAV and C4ISR Systems.

got geoint? got





percent of smartphone owners use automatic location-tagging





PANELISTS at the GEOINT 2012 Symposium discuss Activity-Based Intelligence (ABI).

ABI WORKING GROUP TO HOST FORUM IN MAY

USGIF MEMBERS and the GEOINT Community have created an Activity-Based Intelligence (ABI) Working Group. The ABI Working Group has been established to inform and educate the Community on a common understanding of ABI, as well as to enhance communication among relevant government and contractor circles about the ABI value proposition.

One of the first activities of the working group is to help develop and coordinate an ABI Forum to be held at NGA Campus East in May. More details will be available online at www. usgif.org, but this two-day, classified event is expected to attract a large audience.

Since December, the group has grown rapidly from a dozen members to nearly 70, representing 28 USGIF member companies and eight government organizations.

"The Activity-Based Intelligence Working Group is another great example of the power and agility of USGIF and our members to recognize an emerging need in the Community and turn to it quickly and meaningfully," said Keith Masback, USGIF president. "The rapid growth of the working group is a testament to the importance of its mission and the tremendous potential benefit to the nation."

For individuals or organizations that would like to be involved with the ABI Working Group, contact Jeff DeTroye, working group chair, at abildusgif.org.

USGIF TRADECRAFT SUBCOMMITTEE MATURES

ANOTHER FANTASTIC SUCCESS story has sprung out of the USGIF Technical Committee. After a few years of great work, the Tradecraft Subcommittee's mission and activities

> have increased and warranted an upgrade to full-fledged committee. In light of this change, the subcommittee is now renamed the USGIF Tradecraft and Professional Development Committee.

The committee will focus on tradecraft and training. Specifically, it will strive to capture what the workforce does on a regular basis and how to do it better, while also keeping an eye on current and future requirements. By examining the practical applications and ramifications, the committee hopes to better define the tradecraft.

The Tradecraft and Professional Development Committee also plans to play a large role in current and future training requirements. The group has for the past several years been involved in discussions surrounding analyst training, which is now emerging as USGIF's Professional GEOINT Certifica-

tion efforts in parallel with NGA's GEOINT analyst certification initiatives. The committee will use any other opportunities to help train and educate the workforce.

USGIF GOES TO DAYTON

Based on the success of last year's technical workshop at ADF-Colorado near Denver, USGIF is returning to Denver for another workshop, and also expanding the program to the National Air and Space Intelligence Center (NASIC) in Dayton, Ohio.

An unclassified day of government briefings, industry presentations, and research and development demonstrations at the University of Dayton Research Institute April 30 will offer attendees an opportunity to discuss some of the technologies and solutions being developed in the Dayton area. This day will feature a variety of U.S. Air Force programs from AFRL, AFIT, LCMC, and NASIC.

The following day, May 1, a classified presentation focused mainly on NASIC will allow for nearly 500 attendees to see up close NASIC's unique mission. Tours of the facility and desk-side presentations will complement a full day's agenda of keynotes, panels, and briefs.

More information about registration and the agenda can be found at www.usgif.org/events.



HARRY "ED" MORNSTON, director of NGA-Denver, addresses GEOINTeraction Tuesday attendees during USGIF's Technical Workshop in Denver.



ODNI GEOINTERACTION DRAWS RECORD CROWD



WINSTON BEAUCHAMP, director of the mission integration division within the Office of the Director of National Intelligence (ODNI), addressed a packed house Jan. 8 at GEOINTeraction Tuesday, USGIF's first event of 2013.

Beauchamp said he has learned a lot since taking this new position four months ago following a long tenure with the National Geospatial-Intelligence Agency (NGA). He also emphasized the value added by the DNI focus on intelligence integration.

"[Integration is] a truly a noble goal and I think it's worthy of our best efforts," Beauchamp said.

Although the Intelligence Community has made progress toward integration and demonstrated flexibility and resiliency in light of changing threats and budget cuts, Beauchamp said there is still much to be done.

"While we are not where we want to be yet, if we hadn't made this hardright turn two years ago, we'd be in trouble," he said.

Beauchamp said he has also witnessed a "relentless focus on analysis driving the mission."

He added as resources are often allocated to the top handful of countries, it's important to consider how the Community can provide warning and best respond to new threats with a global focus. In this fast-paced environment, Beauchamp said, many analysts are turning to new methodologies that are anticipatory in nature, such as activity-based intelligence (ABI) to make sense of large quantities of data.

"Folks are moving in that direction on a variety of fronts and for a variety of different mission areas," he said. Looking ahead, Beauchamp said the Intelligence Community Information Technology Enterprise (IC-ITE), the cloud-computing environment being designed for use by all intelligence agencies, will begin to take hold and draw users and missions away from stovepiped architectures.



Trajectory bested four other finalists in the category of Strategy: Best New Launch or Relaunch to win Gold at the Custom Content Council's 10th annual Pearl Awards celebration in New York City. The award was presented on Nov. 5, 2012, to USGIF's partner GLC. The CCC is the leading association for the custom publishing industry in the U.S., and is focused on promoting the growth and vitality of this dynamic marketing discipline. Pearl Awards recognize excellence in custom media in the areas of design, editorial, and strategic initiatives in print and digital.



BE A PART OF THE ONLY ORGANIZATION DEDICATED TO PROMOTING THE GEOSPATIAL **INTELLIGENCE TRADECRAFT**

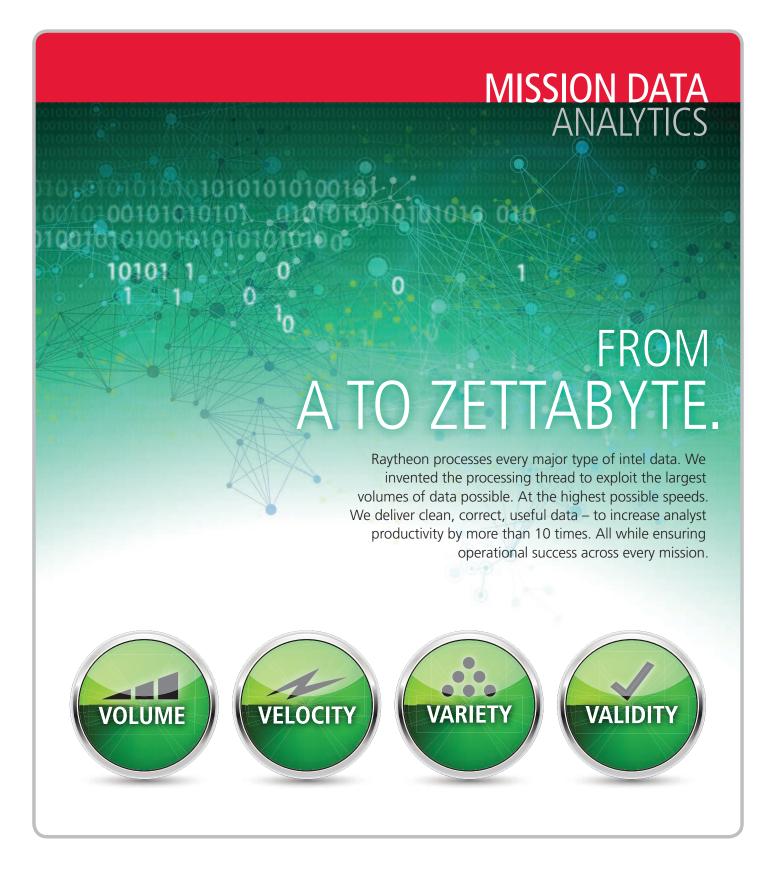
INDIVIDUAL & SUSTAINING MEMBERSHIP PROVIDES UNIQUE OPPORTUNITIES

- · Interaction with defense, intelligence and homeland security professionals
- Influence on key issues affecting the GEOINT Community
- Subscription to trajectory the official publication of USGIF
- · Educational programs and career development with access to USGIF job board and career fair
- Access to senior defense, intelligence and homeland security leadership
- · Enjoy member discounts and networking opportunities
- · Substantial event discounts at:
 - GEOINT Community Week
- GEOINT Symposium
- NGA Tech Showcase (East & West)
- Workshop Series

INTERESTED IN BECOMING A MEMBER?

Call 888-MY-USGIF, visit www.usgif.org/membership or email membership@usgif.org to learn more about how a membership in the United States Geospatial Intelligence Foundation can support you or your organization's mission!







Raytheon

Customer Success Is Our Mission

A SOCIAL APPROACH

The GIS program at UT Dallas incorporates many academic disciplines

> **NE MIGHT EXPECT** to find the geospatial information science program at the University of Texas at Dallas housed within the School of Natural Sciences and Mathematics-but

Located within the School of Economic, Political and Policy Sciences, the geospatial information sciences (GIS) program at UT Dallas explores not just the technical side of the subject area, but also its applications within the social sciences.

"There are few [GIS] programs in the country that can say they are housed in a social sciences school," said Denis Dean, Ph.D., dean of the School of Economic, Political and Policy Sciences. "Here at UT Dallas, we offer a well-rounded approach to geospatial intelligence. We pair our strengths in the technical aspects of spatial statistics, geo-computation, and remote sensing with the strengths that a social science school offers. For example, we try to get our students into courses in public administration and public policy, which relate to [applications] like infrastructure protection."

In 2009, UT Dallas became the third academic institution in the nation to achieve USGIF accreditation for a GEOINT or GIS program. The 20 Ph.D. students, 50 graduate and certificate students, and 55 undergraduates who are enrolled in the UT Dallas GIS program receive instruction from faculty who are experts in the field, Dean said.

Among the most notable faculty members is Brian J.L. Berry, Ph.D. His contributions to urban and regional research helped spark geography's social-scientific revolution of the 1960s and gained him a place among the most cited geographers of the past 25 years. Today, Berry works one-on-one with Ph.D. students and has some strong insights on the future of geospatial intelligence.

"As I see it, the major developments are going to be a continuation of more and better sensors of a variety of kinds, which will [create] data environments that are richer and richer," Berry said. "Some of the more interesting developments will come in new and improved methods



A GROUP OF STUDENTS from around the world participate in a class exercise as part of an international spatial filtering conference conducted by UT Dallas faculty, with support from the National Science Foundation.



PROFESSOR BRIAN J. L. BERRY, Lloyd Viel Berkner Regental Professor, leads a discussion in an advanced geography class at UT Dallas.

of data mining that are fully cognizant of both the requirements and capabilities of spatial analysis."

Berry also referenced the rapid emergence of other fields, such as game design and gaming.

"I think that there will be a marriage of gaming technologies, spatial analysis, and the need for intelligence so that there is a much deeper understanding of the nature of spatial interdependencies, and change, and greater anticipatory capabilities," he said.

Berry also noted that the fastest growing undergraduate and master's program at UT Dallas is a degree in arts and technology, which concentrates on education in gaming technologies.

"We are already discussing ways in which we can link up with that relatively new and very rapidly developing program," he said, further emphasizing the GIS program's inclusion of other disciplines.

Dean said other prominent GIS faculty members include Fang Qui, Ph.D., and Daniel Griffith, Ph.D. Qui's latest research and development efforts combine light detection and ranging (LiDAR) and hyperspectral imagery.

Griffith helped pioneer a technique called eigenvector spatial filtering, which is a sophisticated way of analyzing remotely-sensed data. The filtering technique can be used to process raw data acquired from satellites or aerial photography to identify what is in those images based on not just spectral characteristics, but also spatial patterns.

"[Griffith's] work is really revolutionizing some of the processing in remotely-sensed imagery that we are going to see in the future," Dean said.

Students in the program have the opportunity to work alongside faculty members like Griffith and Qui on their respective research and development efforts. For some, that has meant working with Qui in collaboration with local governments for a project dealing with the urban forest in the Dallas-Fort Worth area. The project involved using remotely-sensed imaging and data to identify individual trees through their species, health, and growth characteristics.

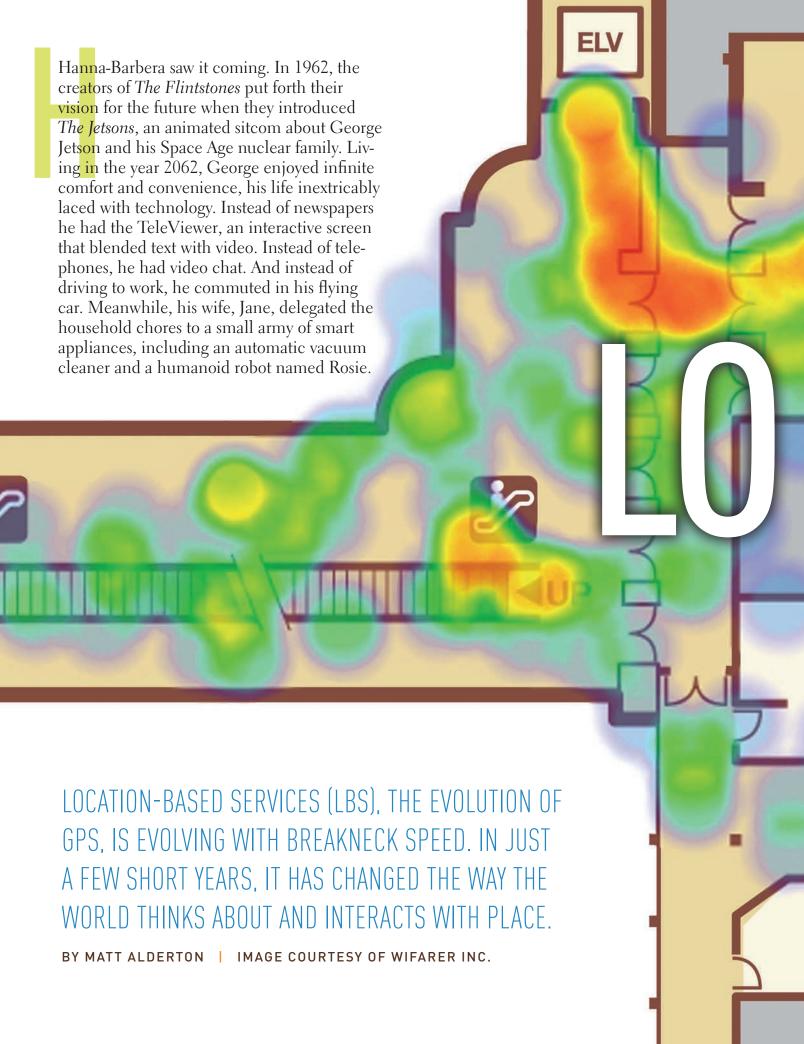
Other hands-on student experiences include opportunities to solve real-world problems within the oil and gas sector, aerospace industry, and environmental areas. For example, students have worked with Raytheon to develop technologies which first responders to large natural disasters can use to learn about an unfolding disaster in order to deploy resources effectively.

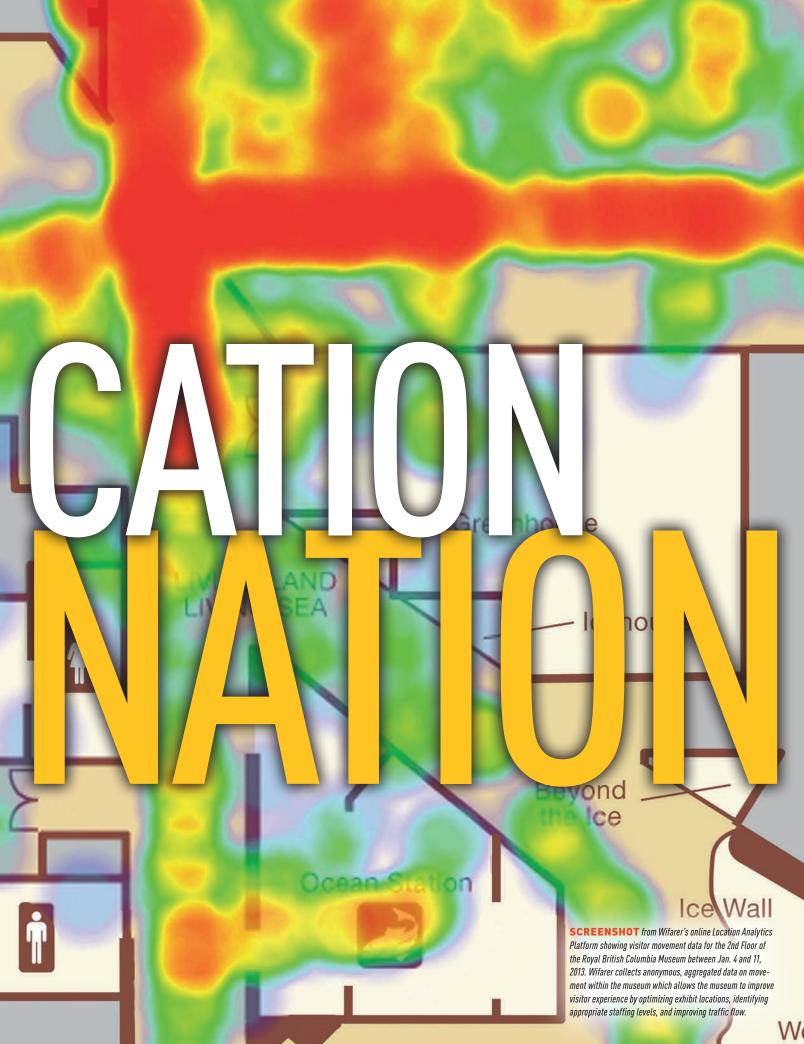
"It's a very exciting time [for our students] to be involved in this field," Dean said. "Hold on to your hats, because it's only going to get more exciting as time goes on." # BY KATHLEEN HAGAN

We set BIG Data free.

Unleash the full potential of your data. We can help.







Just 50 years from The Jetsons' epoch, the world still lacks flying cars. However, it has TeleViewers in the form of iPads, video chat courtesy of Skype, and even a robot vacuum thanks to iRobot's Roomba.

Society now also has location technology, similar to the kind that notified Jane when George was almost home from work, and automatically flew the family car to its destination of choice. An evolution of GPS that's known as location-based services (LBS), this breed of technology is evolving with breakneck speed. In just a few short years, it has changed the way the world thinks about and interacts with location.

"Every single new 21st-century data source contains location," said Simon Thompson, director of global business solutions at GIS software company Esri. "This is creating massive amounts of data about people ... and what you're now seeing is quants moving from financial services and Wall Street into marketing, real estate, and [other] areas in order to tell you what you can get by mining all this data."

Thompson describes the simultaneous proliferation of social media,

location-aware technology, and mobile device usage (SoLoMo) as a perfect storm of geospatial potential.

William Hanna and Joseph Barbera fantasized about such potential with The Jetsons. Science fiction writer Arthur C. Clarke, on the other hand, outright predicted it: "Perhaps in 30 years the orbital relay system may take over all the functions of existing surface networks and provide others quite impossible today," Clarke, author of 2001: A Space Odyssey, wrote in a letter to his friend, Andrew G. Haley, in 1956. "For example, the three stations in the 24-hour orbit could ... make possible a position-finding grid whereby anyone on earth could locate himself by means of a couple of dials on an instrument about the size of a watch ... It might even make possible worldwide personto-person radio with automatic dialing. Thus no one on the planet need ever get lost or become out of touch with the community, unless he wanted to be. I'm still thinking about the social consequences of this!"

The social consequences are stunning-particularly in the context of the mobile web, which becomes more

bloated each day with cutting-edge applications capable of collecting, analyzing, and utilizing location data. With immediate benefits for individuals and businesses, and promising applications in government and defense, LBS is poised to turn one's physical coordinates into a digital key that unlocks a new era of personalized commerce even a Jetson would envy.

EXPONENTIAL GROWTH

Since the dawn of the iPhone in 2007, smartphone ownership has spread exponentially. In 2012 alone, smartphone ownership among American adults rose to 46 percent from 35 percent the year before, according to the Pew Research Center's Internet & American Life

Growing equally fast are mobile apps. The share of adult cellphone owners who had downloaded an app nearly doubled from 22 percent in 2009 to 38 percent in 2011, according to Pew. Taking into account adults whose phones came pre-loaded with apps, more than 50 percent of all U.S. adult cellphone owners now have apps on their phones many of them location-enabled. In



enhanced with location analytics.

fact, the number of U.S. adults who get location-based information on their smartphones has nearly doubled in the last year, growing from 23 percent in 2011 to 41 percent in 2012, according to Pew.

"This is a space that's heating up a lot right now ... there's an instinct that [LBS] is going to be a really big deal for smartphones in the same way that GPS was a really big deal for [navigation]," said Dan Ryan, founder and CTO of indoor positioning company ByteLight. "In the future, you can imagine a situation where you walk into a retail store and your phone leads you to a particular product. Or maybe you pull out your phone in front of an exhibit you like at a museum and it pushes you some content about that exhibit. The whole idea of geospatial-aware computing has everything to do with making computing more relevant and more useful."

Relevance means context, according to Thompson, who says LBS is evolving beyond "location" - latitude and longitude-to accommodate "geography" and "place."

"Your geography is your distance from a location, how far you've traveled to get there and whether it's your home location or your place of business," Thompson explained. "Place is who is here and what they are doing. If I know at this location there happens to be a cinema that's part of an outdoor mall, I now have a whole contextual understanding of the people who are there and why they might be there."

ANYWHERE IS POSSIBLE

For consumers and businesses alike, SoLoMo represents a technological Uturn, according to Thompson, who says the Great Recession catalyzed a social and economic movement from "global" to "local."

"Location has become a mechanism to enable hyperlocal business intelligence," Thompson said. "A business that wants to grow in a slow-growth economy has a couple of choices: It can expand its footprint and hope to reach the mass market, which is the Coke and Pepsi model, or it can be very, very focused on operating in the most profitable areas and locations ... We're moving away from living in clone towns where

we're given the same shops and the same media and the same merchandise. Historically, mass-merchant brands used technology to out-compete small brands and local businesses, but now those local businesses can exploit and use technology in exactly the same way, so we're seeing a renaissance of local flavors."

SoLoMo isn't just localizing commerce. It's also localizing information, according to Charlie Davies, director and cofounder of British LBS company iGeolise.

"When the Internet began, it was all about how amazing it was that you could read content no matter where you were in the world," Davies said. "That spreading of content was great because it disengaged people from their actual environment. LBS has helped re-engage people in and around their local area. As a result, the Internet that was supposed to break away local boundaries is now securing them."

Simply put: After two decades of retreating into the virtual world, people are using LBS to rediscover the physical one.

"The moment you get in your car and drive somewhere, you are by definition bound to your physical environment in a way you're not when you're surfing your iPad," said Lise Murphy, vice president of marketing at Wifarer Inc., a Canadian provider of indoor positioning technologies. "That's an undeniable aspect of being human. You live in a specific place and you go to specific locations. So why not develop apps and technology to enhance your experience in physical

The technological possibilities are just as infinite as the number of physical spaces one can visit. For instance, location-based apps already exist for:

■ Socializing: Social media platforms like Foursquare, Facebook, Twitter, and Yelp allow location sharing among friends, family, and acquaintances.

PRIVACY, PLEASE

According to the Pew Research Center's Internet & American Life Project, privacy is a major concern for mobile app users, 57 percent of whom have either uninstalled an app or avoided installing one because of concerns about sharing personal information. The risks are especially fraught when the information in question is location, raising concerns about stalking and surveillance.

For that reason, the Federal Trade Commission (FTC) included location in "Marketing Your Mobile App: Get It Right from the Start" (www.business.ftc.gov/documents/ bus81-marketing-your-mobile-app), its guide to ethical mobile app development, published in September 2012.

"It's important to get users' affirmative OK before you collect any sensitive data from them, like medical, financial, or precise geolocation information," state the FTC quidelines.

The guidelines, however, are just that: guidelines.

"Courts are starting to look at this issue, but there haven't been a lot of cases yet with respect to location information," said Kevin Pomfret, director of the Centre for Spatial Law and Policy. "The FTC has broad authority to protect consumer privacy, but they haven't moved directly into the location privacy area yet. Congress is looking at developing laws that would regulate how you can collect and use location information, but they haven't passed any. So, there's still a lot of uncertainty."

In the absence of location-specific laws and regulations, it's up to app developers to self-police in the area of privacy, which a majority are doing by requiring users to opt in to location sharing, anonymizing the location data they collect, and reporting location analytics only in aggregate.

"There are natural privacy concerns and we need to be better at overcoming people's fears about the use of information while safeguarding their privacy," said Simon Thompson, director of global business solutions for Esri. "That's an area I think we'll really develop in the next 18 months."

The result is a geosocial community that allows people to simultaneously exchange information about locations and spontaneously congregate.

Navigation: Navigation is the primary use for GPS in mobile apps. Now, a new wave of technology is helping people navigate based on travel time instead of distance. iGeolise, for instance, allows smartphone users to select their mode of transport—car, public transit, or bicycle—then search locations based on proximity. For example, five minutes instead of five miles. The technology is being used in apps to help workers find jobs close

MUST-HAVE

HIGHLIGHT: Highlight uses Facebook data to show friends, friends of friends, and people with similar interests who are located around you. If you're at the airport, for instance, your phone will notify you if an old friend from high school is waiting for a flight at the gate next to yours. Also try Banjo.

HERE ON BIZ: Ideal for business travelers, Here on Biz synchronizes users' location with LinkedIn in order to show nearby professionals who are also using the app, facilitating impromptu networking at the convention center or even the hotel bar. Also try Unsocial.

FOREVERMAP: ForeverMap uses data from the OpenStreetMap project—the so-called "Wikipedia of maps"—to provide online and offline access to detailed maps of cities, states, countries, and continents. It includes routes for cars and pedestrians, while allowing users to search for points of interest around them. Also try Nokia's HERE Maps.

WAZE: Waze is a communitybased traffic and navigation app that provides real-time updates from other users. With the ability to report traffic accidents, road hazards, and more, the best route to take is just a download away.

SHOPKICK: Shopkick is a location-based shopping app that awards points, called "kicks," when users physically visit a retail location. Consumers who save up their kicks can use them for rewards at their favorite merchants.

to home; travelers locate restaurants near their hotel; and retailers discover customers near their store.

- Indoor Wayfinding: Indoor navigation is a compelling proposition, particularly in sprawling venues like convention centers, stadiums, airports, hospitals, shopping malls, and museums. Because GPS typically isn't suited for indoor use, several companies are developing alternative solutions. Wifarer and Meridian, for example, utilize venues' existing WiFi networks to determine a smartphone's indoor location. ByteLight, on the other hand, has designed special LED light bulbs that are equipped with location transmitters. With Bytelight, when your smartphone's camera "sees" the light, it knows where you are, even in areas that lack WiFi. In all three cases, the technology gives users turn-by-turn directions—to the restroom, a vending machine, an exit, or even a specific product or service, such as the cereal aisle at a local grocery store or the baggage claim at a foreign airport.
- Exploration and Engagement: The same technology that allows users to navigate venues can also allow users to engage with them. Meridian, for example, has worked with New York's Metropolitan Transportation Authority (MTA) to create an app for the New York City subway system, which is home to more than 200 works of contemporary art. Using the MTA's app, commuters and visitors can browse the art, learn about the artists, and get directions to their favorite works.
- Notifications: Apps also can deliver location-relevant offers and alerts. Using the concept of geofencing, whereby a digital "fence" is drawn invisibly around a neighborhood, district, region, or venue, such as Cowboys Stadium in Dallas or SoHo in Lower Manhattan. Apps powered by GIS companies like Geologi and Maponics can detect when you've entered a given area and send relevant notifications to your smartphone. For example, a shopping list when you arrive at the grocery store or a coupon for the Gap when you pass by it on your lunch break. Using "geotriggers" in combination with custom geofences, users can even program their phone to wake them up

when they get to their bus stop, or to turn on the lights when they're almost home from work.

GOING PUBLIC

Although location-based apps have yet to gain widespread adoption in government and defense, the applications are just as vast in the public as in the private sector, according to Bhavin Shah, vice president of marketing and business development for Polaris Wireless, which provides wireless location solutions in three verticals: enterprise, emergency response, and law enforcement.

"The [location-based] technologies that are being developed right now have unlimited potential," Shah said.

Forward thinkers in the DoD have already recognized such potential. In 2011, for instance, the National Geospatial-Intelligence Agency (NGA) introduced its own app store featuring mobile apps for national security. Called the GEOINT Applications Storefront, or the GAS Station, it currently features around 100 apps, though NGA envisions there will eventually be thousands. Likewise, the U.S. Army in 2010 launched an "Apps for the Army" applicationdevelopment challenge, which yielded 53 mobile apps, 25 of which were certified for Army use. The Army Software Marketplace followed, of which a beta version was launched in March 2012, with 12 mobile training apps for soldiers to use on smartphones or tablets.

Elsewhere in the public sector, the nature of government means adoption of mobile apps in general—and locationbased apps, in particular—still lags.

"Government agencies are being left behind because the sophistication doesn't keep pace with the laws and mandates they have to adhere to," Shah said. "As a result, a police officer can do 20 more things on his iPhone than he can with the old Motorola two-way radio device he still carries around at work."

Along with legacy systems and laws, public-sector obstacles include fragmentation—government agencies deploy technology disparately and inconsistently—and security: Most commercial solutions aren't yet secure enough for sensitive military and government applications.











"The whole idea of geospatial-aware computing has everything to do with making computing more relevant and more useful." — Dan Ryan, founder and CTO of ByteLight PHOTO COURTESY OF BYTELIGHT

BYTELIGHT'S indoor location-based information is used to operate a personal exploration rover via iPad at the Mars Yard exhibit of the Museum of Science, Boston.

Once those barriers are overcome, LBS will be primed to deliver on a larger scale a wealth of public safety and national security benefits, many of which already are being tested by early adopters. Using geofencing and indoor location services, for instance, law enforcement agencies with a special warrant could track criminals in a given area; the U.S. military could optimize base layout and logistics; emergency personnel could better and more quickly locate victims in a disaster zone; and local governments could issue real-time alerts to citizens about road closures, inclement weather, and public services.

PRODUCT PLACEMENT 2.0

We've all heard of return on investment, but because they yield location analytics, geospatially enabled apps promise a "return on location" for both consumers and enterprises.

Businesses, for instance, can more effectively target their products and services to the people that actually want them by recording where and when consumers check in, where they navigate to within a location, and how long they spend there.

"It doesn't matter if it's a Walmart, a Target, a bank, or a car dealership; everyone's changing their business model to ... [match] the right people to the right product in the right place," Thompson said.

LBS also allows businesses to create new revenue streams by selling in-app advertising and identifying more business opportunities.

"One of our customers is a stadium," said Jeff Hardison, vice president of marketing and business development at Meridian. "We noticed that everyone at the stadium was searching for a water fountain [within the venue's app]. The management of the stadium had no idea [water] was in such demand. So they started selling bottled water next to the water fountains."

In early 2012, Foursquare completed an internal project that illustrates perfectly the value of location analytics: Using geofences supplied by Maponics, engineers analyzed Foursquare check-ins from across New York City to determine the character of places people were frequenting in various neighborhoods. Based on that analysis, they built profiles of each neighborhood for the purpose of comparison.

"Williamsburg and West Bronx are a very close neighborhood character match," explains Paul Gallagher, vice president of marketing and product development for Maponics. "If you're an advertiser who has a really good match with people in West Bronx, this allows you to say, 'Williamsburg is probably a good place for me to find the same type of buyer I'm trying to reach."

Next, Foursquare did the same analysis in San Francisco and several other

U.S. cities. As a result, one could ascertain that the San Francisco equivalent of New York's East Village is the Mission Dolores neighborhood.

"If I have a product that's doing well in this local market, this allows me to see what global markets that's applicable to," Gallagher said.

The analysis is equally advantageous to consumers, who receive offers and experiences tailored to their interests in exchange for sharing their location.

"The consumer is inundated with information," Gallagher continued. "Whether it's emails or web articles or RSS feeds, there's just way too much information out there to make sense of it. People don't want to have to sift through it anymore. They want to receive only the information that's most relevant to them, and without being asked what that is. Without coming off as being Big Brother, [LBS] enables companies, businesses, and government agencies to leverage geographic data to read the consumer's mind and provide them with information that meets their needs in a timely fashion."

As location-based apps migrate further into government and defense, the needs being met won't just be social and commercial. Equally, they'll be civic and military, transforming the technology into a force for public good.

"The technology exists," Shah said. "Now the question is: How do we convert it into real-time actionable intelligence for government?"

The answer remains to be seen. However, one thing is clear: Despite the dystopian predictions of many a science fiction novelist, location technology won't further detach us from the physical environment. Rather, it will reunite us with it.

"Looking back at the last 15 to 20 years, we started interacting more with the world through our desktop computers, tethered to our home or office," Hardison concluded. "There on some level was less fascination with the physical world because the digital world was so exciting. Now, the physical world is interesting again because we can use our smartphones and other technologies to learn more about what's around us."



PERCENT OF **SMARTPHONE OWNERS USE LOCATION-BASED SERVICES**

SOURCE: FLOWTOWN AND PEW RESEARCH CENTER



TO BE CONTINUED

Check out part 2 of this story in the next issue of trajectory, which will look at the use of mobile GEOINT in government.





MANY OFTEN WONDER how Jeff "Skunk" Baxter, famed lead guitarist for the Doobie Brothers and Steely Dan, also came to be a well-known figure in the Intelligence Community, particularly in the areas of missile defense and GEOINT. Following a meeting with the USGIF Young Professionals Group at GEOINT 2012 in October, Baxter took the time to sit down with trajectory managing editor Kristin Quinn and tell his story. It's a journey that began with a mudslide, some magazine subscriptions, and an impromptu missile defense paper, leading to a life that Baxter describes as beyond his wildest dreams.

Where would you say your journey from the music industry into the defense world first began?

In 1994, I wrote a paper about how AEGIS, which is a U.S. Navy system originally designed to defend American carrier battle groups, might be modified to do theater missile defense.

So, you just one day decided to sit down and write the paper?

Pretty much. I had some input from a couple friends, one of whom mentioned a capability to track the space shuttle with a certain kind of radar, which happened to be the same kind of radar on which the U.S. Navy's AEGIS system is based. I asked a friend to do some math for me to test my hunch that the same radar could track a missile warhead. Then I wrote a paper based on that knowledge and gave it to Congressman Dana Rohrabacher, who then gave it to

I took Tom Ager's radar course at NGA. Not long after, I was introduced to John Lauder over at the NRO through B.M. "Dusty" Rhoades, and then I started doing some consulting for the NRO. He got me involved with NIMA at just about the time General Clapper came over to head up NIMA and morph it into NGA. They were looking for somebody who approached problem solving from a different point of view. I didn't have some of the knowledge that those folks did, but I also didn't have some of the constraints, and it's been an honor and a privilege to work with the folks at NGA.

What initially sparked your interest in these topics and led you to write the paper?

I was reading a lot of trade magazines, especially Aviation Week and Jane's Defense. Much of the information I gained from that I was applying in the I think so, being that I am a bit of a diode-head, as are most guitar players. Guitar players are all about stuff to plug in to other stuff, searching for new and different sounds. I have a self-taught technology background because I learned how to repair and design guitars and electronics myself. You stick a knife in a toaster and immediately learn which way the electrons go. Same with trying to apply what I know of the art of music to the art of intelligence analysis. I found that, at least for some people, because I hadn't grown up in the IC or DoD culture, they felt I had something to offer in terms of a different point of view about approaching and solving problems in the intelligence world, and being able to come to some non-typical conclusions.

What makes you passionate about national security? Is it a matter of patriotism?

I love my country. I've traveled around the world and seen what the alternatives are, most of which are not very pretty. I've been to some of the best places you can go. I've also been to some of the most horrifying places in the world. When you see what the real world is really like, you come back and get off the airplane and kiss the ground, and want to preserve this country and what it stands for. That a nation could be built on the concept that individual freedom is the most important function of a society and government is unheard of in most places on this planet and in the history of mankind. Having been a musician in the U.S. means I have the freedom to make and play the music I want to. I have a friend who was an ambassador, and when he was growing up behind the Iron Curtain he told me about the improvisation police. If they came into a venue and heard you playing a guitar solo that was not on the original record, they could shut you down and arrest you, because you were exercising freedom of ideas, breaking the mold, thinking outside the accepted norm. Many people in this country don't realize that kind of thing was and still is a reality. I also remember reading about how the Taliban was cutting the hands off musicians in Afghanistan, took that a bit personally, and thought, "It's time to step up." Many of my friends

"People like the Taliban aren't afraid of bullets. They are scared to death by something that represents freedom of thought and expression. That makes art a pretty potent weapon."

> the vice chairman of the House Armed Services Committee (HASC), who asked, "Is this guy from Raytheon or Boeing?" Dana said, "No, he's a guitar player for the Doobie Brothers." So, I guess that piqued his interest. The next thing I know I was offered an interesting position to be the chairman of the Civilian Advisory Board for Ballistic Missile Defense for the HASC.

How did your interest in defense technology progress after writing the paper?

I got more and more into it because the people I was working with gave me opportunities to be involved—to help with system design, understand different ways to approach the architecture and do some Red Teaming. I realized I had an inherent understanding of radar, because radar is really just music on steroids—a fact that was underscored for me when

musical instrument business. At the time, back in the late '70s and early '80s, the companies that designed musical instruments and video and audio recording equipment were just beginning to apply digital technologies for music recording and musical instrument design. Up until then, nearly everything was being recorded in an analog format, but the Defense Department and the government were exploring technologies to do things digitally instead of analog. As I began to see some of the technologies that were emerging, especially in areas like data storage, new data-processing algorithms based on digital technology-and having been somewhat of a computer geek anyways-I saw opportunities to translate some of that technology into the commercial world.

Is it safe to say that you approach problems from a more artistic angle?

in the music business have asked me how they can participate and support the DoD and the IC. I tell them they do not necessarily have to get involved directly (although some have, with great results-folks like Dan Avkrovd, Nils Lofgren, and Gary Sinise, to name a few), but that every time they play a note or sing a lyric they are striking a blow for freedom. People like the Taliban aren't afraid of bullets. They are scared to death by something that represents freedom of thought and expression. That makes art a pretty potent weapon.

Were you entirely self-taught in defense technology?

I certainly was and am a bit of a computer geek. Back in the late '60s and early '70s, there was no way to learn about computers other than having one and spending time with other like-minded folks. In the late '70s, we'd had bad rains where I was living in L.A., and an older neighbor's house flooded with mud so I helped him shovel it out. Afterward, he invited me into his study and I saw all these pictures of airplanes and missiles on the wall—it turned out he was one of the guvs who had invented the Sidewinder missile. As a gift for helping him clean out his house, he gave me a subscription to Aviation Week and to Jane's Defense. It was amazing. It gave me an opportunity to dive into and learn about the cutting edge of what was going on in military and aviation. It was like taking a course in military technology.

Why do you believe GEOINT is important?

After my experiences at NIMA and NGA, I share the vision that pretty much all intelligence is geospatially based. Everything happens somewhere. Everything happens someplace. Whether or not that someplace is a physical point, a point in space, or even on a network—it's all about location. I believe GEOINT is the perfect common denominator that all the "INTs" can relate to.

What have you learned from your position about diversity in the Intelligence Community?

I've been fortunate to work with and learn from some amazing people in the Intelligence Community. Some folks



SKUNK BAXTER (center). Chris Tucker (left). and Brian Hibbeln (right) stop by the Young Professionals Lounge in the exhibit hall at the GEOINT 2012 Symposium to share advice and experiences.

would posit that when you walk into this thing with a background of making hit records, that experience doesn't really prepare you to be able to contribute to the IC. But early on, I met some people who took a chance and said, "You know what, it's time for a different perspective, and we'll take a shot." We have a saying in the music business that "everyone loves you when you play Carnegie Hall, but you really know who your friends are when you are playing the clubs." I will always appreciate the folks who gave me the chance to get involved in this new part of my life. I believe art plays a large role in creating the best analytic product, and artistic capabilities relates to one's culture. Some cultures do certain things better than others, some have niches of expertise, and they all certainly have different perspectives. Monolithic cultures have a tendency to analyze monolithically. Because America is such a melting pot, we have the advantage of analytic teams with backgrounds from many different cultures. That gives the U.S. a tremendous advantage. It means the IC can approach a problem from a number of facets and levels of experience. That's the way you deliver the best product. The cultural diversity in the Intelligence Community is the secret weapon for the U.S.

Where are you right now and what's down the road for you?

I have been blessed with an opportunity

to make a difference. My life has been beyond my wildest dreams. Being a "rock star" in the '60s, '70s, and '80s-life doesn't get any better, unless you're Louis XIV or something. I appreciate why I was able to have the success that I've had because of being born in the U.S. In the past 15 years or so being involved with the IC, a whole new set of challenges opened up to me and, as a result, I set some new goals, one of which is to support USGIF and the Intelligence Community in growing and becoming all that it can be in an increasingly complex, dangerous, and rapidly-changing world. I'm seeing major cultural, technological, and fundamental changes for the better in the Intelligence Community. Leveraging concepts like virtual reality, immersive analytical environments, breakthroughs in neuroscience, unconventional methodologies, gaming platforms, revolutionary ways to deal with data, and more, is the way of the future for the IC. I believe that the analyst is still the center of the IC universe, and I am excited to see and hopefully play a part in how all that shakes out. And when I finally leave this mortal coil—or when it's time to just go read books and build guitars again — I hope I leave it a little bit better than when I came and fulfill the expectations of the people who gave me the opportunity to be a part of this very special group of folks known as the IC. ■

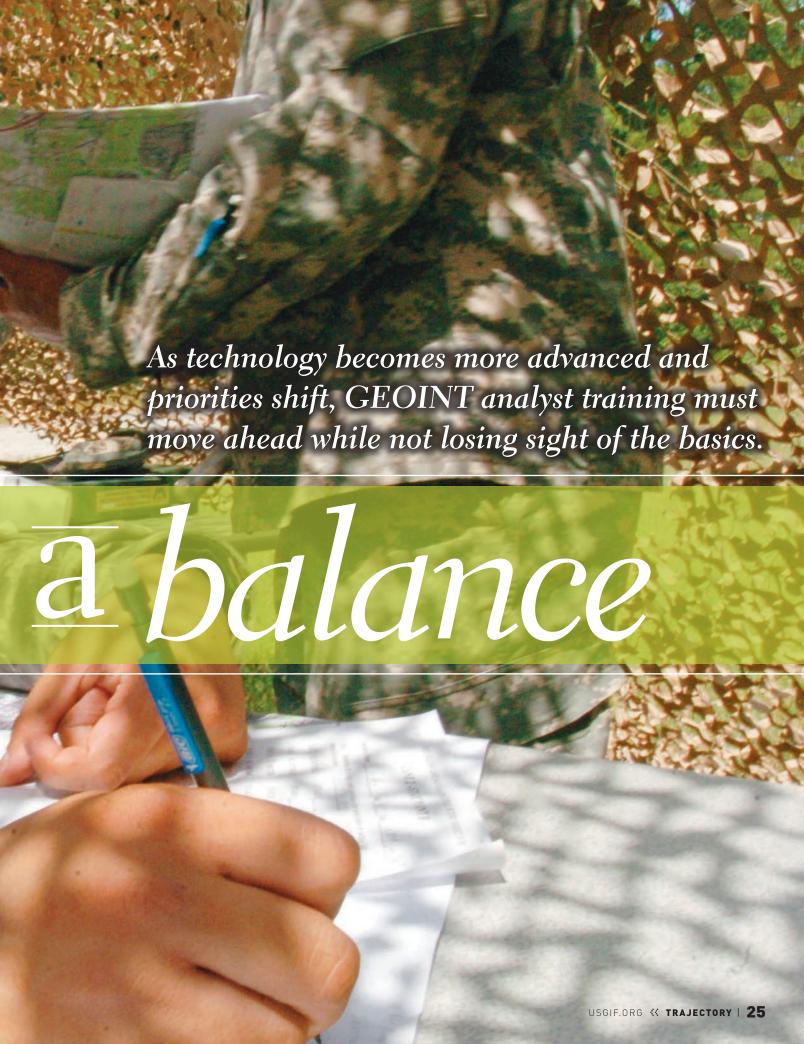
"Is this guy from Raytheon or Boeing?"

"No, he's a guitar player for the Doobie Brothers."

111111111111111111111







Pentagon leaders have been discussing certification and training of all intelligence analysts, to include geospatial intelligence analysts, for several years.

The first step toward establishing a certification program has to do with job and task analyses. Initially, the list of tasks describing what it means to be a GEOINT analyst, spanning duties from an apprentice to journeyman, included a staggering 600 items.

Although this list has since been whittled down to a more efficient approximation of 75 skills that would comprise an "über analyst" and take the length of a career to accrue, it points to the breadth of the challenge that comes with training a GEOINT analyst.

The amount of available data is expanding daily with the advent of resources such as full-motion video (FMV), new and diverse phenomenology such as LiDAR and multispectral, and

open source information derived from social media. New technologies such as cloud storage architectures, high-speed processing, and complex algorithms have also revolutionized the analyst profession over the last decade. The data deluge and a shift in analytic methodology toward activity-based intelligence (ABI) and multi-INT strategies present new challenges for analysts as well.

As a result, the role of GEOINT analyst has grown to cross all disciplines and multiple work roles within the Intelligence Community, and now goes far beyond plotting an event on a map or producing a geospatial product. However, many of the technologies presenting new challenges for training GEOINT analysts may simultaneously be a part of the solution. Changing technologies also highlight the importance of going back to the basics when necessary.

CROWD-SOURCING TRADECRAFT

Lt. Col. Randy Reynolds is the U.S. Army's GIS Officer with Army Headquarters at the Pentagon, and served as the assistant commandant for military training and education at NGA College until May 2011.

Reynolds predicts it's not necessarily how analysts are trained, but what they will be trained in, that will change as they come to rely more on cloud computing, integrated technologies, and

multi-INT strategies.

Reynolds points to the need to increase geospatial analysts' awareness of what other disciplines do and how they do it. But more pressing, he hopes to see a change in policy and culture when it comes to how and with whom data is shared.

"In the future, it's going to become even more important that we develop across the IC those policies that allow discoverability, and then teach people what those processes are."

Revnolds said the Army is also concerned with maintaining skill

sets as geospatial analysts return from Afghanistan. The Foundry Program, part of the Army's Intelligence Readiness Operations Capability (IROC), is addressing this need by standing up intelligence training centers around the country. The centers provide analysts the opportunity to keep their skills sharp by producing deployable products or gathering intelligence on areas that are not current theaters of operation.

Other Pentagon intelligence leaders echoed Reynolds' sentiments Nov. 15 at an intelligence education and training conference in Fairfax, Va. Kip Brailey, the Intelligence Community chief learning officer with the Office of the Director of National Intelligence, said one of his biggest tasks is coordinating training and knowledge sharing across the Community.

The 17 individual intelligence agencies often develop 17 different courses in one subject, according to Brailey, meaning that an intelligence officer on rotation to four agencies will often have to sit through four "flavors" of training.

"We have to figure out ways to take the best training and make it available to everyone in the IC," Brailey said.

Jim Bridgham, training lead with the National Geospatial-Intelligence Agency's (NGA) Denver Office, said NGA has been using aspects of ABI for the past year. This allows students to incorporate actions from many intelligence disciplines, and capitalize on the other organization's training methods and delivery systems.

NGA anticipates employing the Integrated Analytic Environment (IAE), which is based on the Joint Worldwide Intelligence Communications System as opposed to the NGA desktop, into its training model. IAE allows users to find applications within other disciplines that can be applied to their own. For example, an analyst who is used to studying satellite images can use IAE to gain information on ships.

"IAE potentially allows us to further incorporate our focus on activity-based intelligence, recommending analysts look beyond a specific intelligence discipline to incorporate information from other, potentially nontraditional sources," Bridgham said.





TRANSFORMING UNSTRUCTURED DATA

The Institute for the Study of Violent Groups (ISVG) at the University of New Haven is teaching students how to take unstructured data in the form of media reporting, social media, and unclassified government documents, and apply a methodical process to turn it into structured data.

Carlo Pecori is the program manager for the institute, which collects data on silent extremists, violent extremism, and transnational organized crime.

"We're teaching them not only how to use these cutting-edge tools, but this whole concept that in order to use these tools you have to have data, and data on a lot of these threats is hard to come by in an organized manner," Pecori said.

For instance, although a student may be able to aggregate 100 news article on violence in Somalia, it won't be very useful unless that reporting can be turned into data points.

data that is virtually untapped because of the way it is formatted, according to Pecori. ISVG always begins with specific time and location when structuring data, followed by up to 1,200 possible variables in its database. Pecori hopes providing students with an apprecia-

There is a tremendous volume of open source

tion for the value of open source intelligence, as well as the skills to apply it, will help them in their future careers. Although the DoD and Intelligence Community have advanced systems for structured data, the open source intelligence discipline is still burgeoning in the government.

"When these students go on to maybe work for the DoD, Intelligence Community, or law enforcement, they will have an understanding of what's available in open source intelligence," Pecori said. "They can say, 'Well, I have SIGINT, GEOINT, and all of this other information being funneled to me, but what does OSINT say?"

IAE is a relatively new capability, according to Eric Hooton, NGA's Western CONUS regional manager for IT services. Development is continuing at a rapid pace, and the most recent drop in January allows more community-wide use compared to earlier versions that were tailored to a specific capability.

Harry "Ed" Mornston, director of NGA-Denver, said IAE would soon become the analysis and production environment where all analysts work if they want to have full access to the most current integrated intelligence across the IC.

"Training on the Integrated Analytic Environment is going to be exceptionally important for analysts," Mornston said. "And the sooner we can start with that, the better off we're going to be as a fully integrated community."

Mornston noted that in order to create an integrated community, the importance of collaboration needs to become a part of basic analytic training.

"Analysts who want to be more of a community officer and a community analyst are going to need to start earlier than they currently do and become even more familiar with other IC agencies' training and tradecraft," Mornston said.

Rick Barrowman, technical executive with NGA-Denver, said storing data on the cloud allows analysts to educate one another.

"From a training and tradecraft perspective, you're almost crowd-sourcing the tradecraft, because it's no longer done on a single machine. It's done on that virtual environment of the cloud and other people have access to it," Barrowman said.

Dr. Eileen Preisser, director of the Air Force GEOINT Office at NGA Campus East, said sharing is essential to add a level of peer review to analysis.

"The social networking of analysts is key to tradecraft, and we're going to have to teach people to do this better in the future," Preisser said. "That's new in the analytic process because of ABI. You can now discuss events as they unfold versus once or twice a year at a conference."

SERVICES ALIGN

Chief Warrant Officer William Jones II, chief of the Geospatial Skills Division

within the U.S. Army Engineer School at Fort Leonard Wood, leads the service's geospatial engineer courses, which in January 2012 moved from the NGA College at Fort Belvoir.

Jones reflected on how the course has changed drastically since 16 years ago when he went through training, much of which was still manual and involved using permanent marker on plastic overlay. Today, students use software suites to create overlay for an area of Afghanistan in a matter of minutes - a task that would have taken hours if not days when he was a trainee.

"Now, based on the level of technology and the corresponding high resolution data sets, they're making more accurate products much faster than we ever could have before," Jones said. "And, within the operating environment things are happening much faster."

Brian Daley, who serves as the lead GEOINT trainer and certification team leader for the Office of Naval Intelligence's (ONI) Fleet Intelligence Specialist Team (FIST), said more sophisticated technology means a greater emphasis on training GEOINT analysts

> to handle big data and fuse multiple data layers. This means envisioning what kind of multi-layer products will most benefit customers and ensuring that students have a core knowledge in this area.



APPROXIMATE NUMBER OF SKILLS REQUIRED TO BECOME AN "ÜBER **ANALYST'**

"Everyone's pushing ABI, FMV—the GEOINT of the future. My concern is that it might already be the GEOINT of the past, or it might not be as much of the future as it **ONCE WAS."** -Mark Lownethal, president, Intelligence and Security Academy

Training on the Integrated Analytic Environment is going to be exceptionally important for analysts. And the sooner we can start with that, the better off we're going to be as a fully integrated community." -Harry "Ed" Mornston, director, NGA-Denver

> "We're doing things like shifting trends to certain areas of the world and condensing data," Daley said. "[Students] need to take complex input and create a very easy-to-understand output from it."

Preisser said the Air Force is placing more focus on the people-side of analysis. In October, the Air Force launched a two-week advanced analysis course in conjunction with Angelo State University in Texas to focus on the human dimension of analysis.

"It's changing the education and tradecraft because it's forcing us to look at the more humanistic side of things than we have in the past," Preisser said. "ABI brings back this human component we got away from for a long time."

Daley added that the U.S. services are starting to train more closely than they used to.

"Now, analysts are working in these joint centers, so we're starting to train things in a similar way," he said.

REBALANCING PRIORITIES

Mark Lowenthal, president of the Intelligence and Security Academy, and the former assistant director of Central Intelligence for analysis and production, expresses different concerns.

"Everyone's pushing ABI, FMV—the GEOINT of the future," Lowenthal said. "My concern is that it might already be the GEOINT of the past, or it might not be as much of the future as it once was."

Lowenthal said he fears the analyst community has lost its ability to conduct strategic intelligence analysis on targets such as bases and air or naval fleets since 9/11. As the U.S. rebalances toward the Pacific and begins tracking force development in countries such as China, traditional methods of analysis will be just as important as counterterrorism and counterintelligence has been over the past decade, he said.

"A good analyst will probably need to know both," Lowenthal said. He later added, "It's going to be more important to have a more diverse collection system, and to have analysts who can do not just ABI and FMV, but the old-school happy snaps."

Daley said with conventional warfare, it used to be that an analyst sent to one ship performed the same tasks as an analyst on another.

"Now, there's such a different mission based on where you go," he said. "An analyst sent to PACOM versus CENTCOM has a totally different mission, a different problem set, and different tools."

ONI addresses this challenge by plugging lessons learned from recently

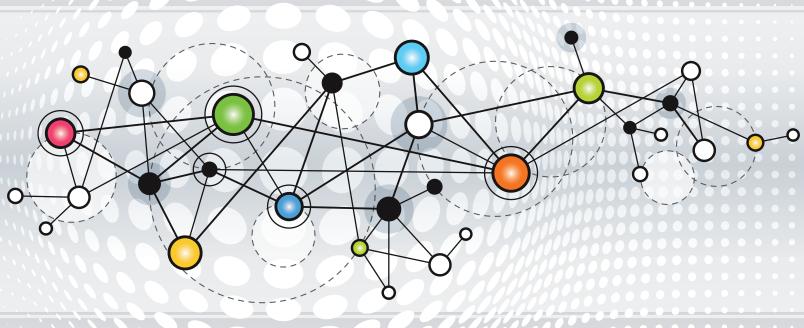


U.S. NAVY

sailors measure the distance between two points on a map in the chart room aboard the aircraft carrier USS Nimitz.



2013 GEOINT COMMUNITY WEEK



MAY 20

USGIF WORKSHOP SERIES MAY 21-22

NGA TECH SHOWCASE EAST MAY 23

USGIF TECHNOLOGY DAY

Held annually in the Northern Virginia area, GEOINT Community Week brings together members from the defense, intelligence and homeland security communities, for a week of networking, classified briefings, technology exhibits and learning workshops.

deployed sailors into the training process, for an on-demand training element, Daley said.

Jones said the Army geospatial schoolhouse also recruits recently deployed soldiers to teach. As operational priorities shift, Jones said the courses have been flexible, by incorporating blocks on topics such as IED analysis.

Students in the geospatial engineering course receive training in both traditional techniques, as well as strategies for asymmetrical warfare using new technologies. However, another concern is that soldiers will atrophy in whatever skills they don't apply in the weeks following training.

"If they're not practicing it in the field, then they will lose it," Jones said. "The challenge is with the units to still maintain that balance between asymmetric and conventional warfare."

Preisser said the Air Force is also beginning to consider how to balance the instant gratification of the ABI environment with long-term second and third phase analysis.

"There are different analytic mentalities," she said. "Some people, because of how their brain works, are really good at "It's great if someone is technologically very smart, but if they can't explain what they're doing or put it into layman's terms for the customer, it doesn't really do much. We always have to be focused on messaging and how you take all of this great technology and apply it."

-Stephen Wood, vice president, DigitalGlobe Analysis Center

tactical and better at crisis management and multitasking. And then there are people who are just better at context and content output."

The Air Force has discussed the possibility of testing analysts to determine what type of analytic missions they are best suited for.

"One of the things you might see in the future is to train people who have proclivities that align better with one of those two areas," she added.

FOCUS ON FUNDAMENTALS

Guillermo Matos, a lead GEOINT analyst with ONI's FIST, warns that technology shouldn't detract from the significance of the human element when it comes to training GEOINT analysts.

"We've gotten so caught up on products and automated systems that do everything," Matos said. "It does not resolve the issue of validation."

Stephen Wood, vice president of the DigitalGlobe Analysis Center, said when

©2013 Accenture. All rights reserved.

When high performance is most critical, Accenture delivers.

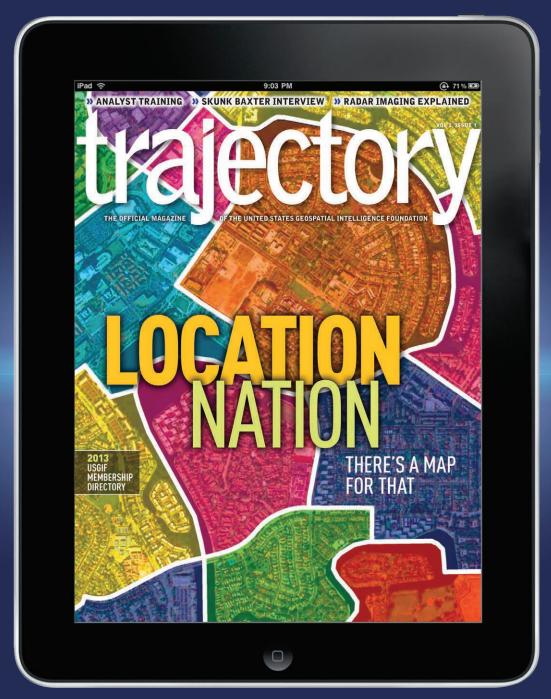
Accenture offers scalable solutions that help drive innovation, lower costs and deliver outcomes for defense and intelligence challenges. For more information, visit us at accenture.com/federal

High performance. Delivered.

consulting | technology | outsourcing

accenture

→ DOWNLOAD →



Download the free *trajectory* tablet app to access enhanced multimedia content







U.S. MARINES

participate in an exercise at Camp Lejeune, N.C.
Service members in the command operations center track and monitor the arriving and departing checkpoints of 10 teams and plot them on a map.



the company is looking for new analysts, it prioritizes skills such as the ability to write well, conduct research, and speak publicly.

"It's great if someone is technologically very smart, but if they can't explain what they're doing or put it into layman's terms for the customer, it doesn't really do much," Wood said. "We always have to be focused on messaging and how you take all of this great technology and apply it."

Despite the prevalence of more sophisticated technology, Mornston said

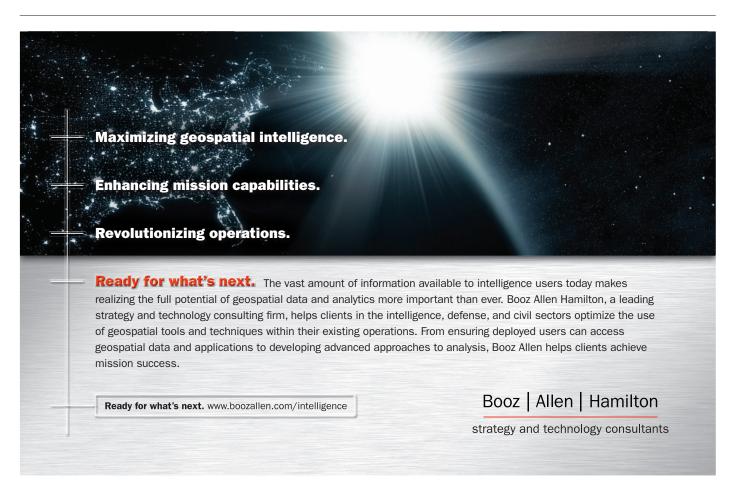
the emphasis on fundamentals should not be lost among the need to pay attention to big data and the IAE.

As analysts are presented with a growing range of capabilities and areas of interest, it will be essential to align training to keep pace with new technologies while maintaining balance by not becoming over-reliant on technology or losing sight of the basics.

"Critical thinking, DNI analytic standards and tradecraft, logic and argumentation, effective writing, source evaluation—we can never forget that those skills are really the foundation that all analysis is built upon," Mornston said.

He added that NGA is currently emphasizing these basics of analysis through initiatives such as a clear writing campaign, analyst certification, and a review of products to ensure they are relevant to the target audience.

"Even with new, exciting techniques," Mornston continued, "an analyst that doesn't have the basics isn't going to be very effective."



Member



DRIVING TRANSFORMATION

L-3 STRATIS INVESTS IN INNOVATION

large company with a small-company approach to solving problems—that's how Bernie Elero describes the culture at L-3 STRATIS, where he has served as chief growth officer and senior vice president for almost two years.

"It's exciting to work within a culture of innovation," he said. "The company is willing to make investments in people and technology resources to help us remain competitive and create solutions for ourselves and our customers."

According to Elero, L-3 was created by bringing together technologies and people to help customers solve their toughest problems. Reston, Va.-based L-3 STRATIS is one of the largest divisions of L-3 and provides cybersecurity, intelligence, and enterprise IT solutions.

L-3 STRATIS customers include the U.S. Departments of Defense, State, Justice, and Homeland Security, as well as U.S. intelligence agencies and select other U.S. federal, state, and local government agencies.

Elero said the division's primary focus in working with its GEOINT customers has been to help them transform.

'To us, transformation means how we help them to implement new technologies—cloud, mobility, and virtualization—with the end goal of driving efficiency," Elero said.

For U.S. Special Operations Command, this entailed implementing a single enterprise information technology solution, which lowered costs and improved performance.



'The real issue is that there is an explosion of data without a corresponding explosion of budget."

— Bernie Elero, L-3 STRATIS chief growth officer and senior vice president

"As we focused on [SOCOM's] needs and implementing their vision, we were able to reduce their per seat cost by nearly 50 percent and transform their IT infrastructure," Elero noted.

In an environment of declining budgets, he said it's imperative that organizations transition their IT operations to a managed services model, which enables centralization of IT infrastructure and reduces the cost and complexity of managing geographically disparate IT functions. L-3 STRATIS has recently been working with Intelligence Community members and other government agencies to set up managed services models in the cloud.

"We have to find ways to help clients solve difficult problems while working with declining budgets," Elero said. "The real issue is that there is an explosion of data without a corresponding explosion of budget. There is an increasing need for speedy transmission, processing, and storage of data, but how do we control the costs?"

Controlling costs is among the many initiatives L-3 STRATIS has invested research and development efforts in, and the division's commitment to collaboration and partnerships makes transformation possible for its customers.

COLLABORATION AND PARTNERSHIPS

L-3 STRATIS hosts a virtual solutions center open to employees and customers around the world, including engineers and developers. Launched in May of last year, the center is a secure, multi-site, integrated research and development environment designed to facilitate the testing and demonstration of new software and information technology solutions.

"Being able to operate in a virtual mode allows engineers and analysts to work collaboratively anywhere in the world in a secure environment," Elero said.

In October of 2012, L-3 officially opened its National Security Solutions Center at the Virginia Tech Research Center in Arlington, Va. This is among the overall efforts the company is establishing with corporations and academic institutions.

"We have many of our engineers co-located at Virginia Tech," Elero said. "There's nothing quite like having them working with university students and professors to strategize about solutions

for our customers.

The company also has research and development agreements with the Massachusetts Institute of Technology, the University of Maryland, and Polytechnic Institute of New York University.

"The point of all these partnerships is bringing the best solutions together for our customers," Elero said. "It's about speed, affordability, and innovation. We bring leadership to that effort." **#** BY APRYL MOTLEY



DURING L-3 CYBER situational awareness operations, employees in the Reston Network Operations Center monitor the health and integrity of the network.



HAVE REDUCED THEIR ENTERPRISE IT COSTS BY



JOIN USGIF To find out more about becoming a member of USGIF, visit www.usgif.org/ membership.

DOWN TO EARTH DATA

Young professionals develop GEOINT apps

Editor's note: The cover story for this issue (pg. 14) explores the explosion of GEOINT-related mobile apps and location-based services in the commercial world. This edition of Gen YPG highlights some young professionals who have led the development of innovative GEOINT apps.

EB APPS like Tomnod Inc.'s Global Insight were meant to draw a crowd. The company builds web apps that take large image sets and host them on the web for many people to view, according to Tomnod CEO Shay Har-Noy, Ph.D.

"We take a crowd-sourcing approach of splitting images up into sections," Har-Nov said. "Crowd-sourcing basically involves engaging total novices with two eyeballs who help to tag the data."

Once tagging is completed, back-end reliability algorithms determine consensus locations and the relevant images can be distributed to mobile platforms. In this way, traditional web apps are used to push information out to the mobile environment.

When Har-Noy's colleagues founded San Diego-based Tomnod in 2010, what appealed to them most was making geospatial information easily accessible to the general public for real-time insight. For example, volunteers used Global Insight to search for a missing plane in Mozambique and to locate the bodies of two friends who went missing while climbing in the Peruvian Andes.

"Because we're not working with experts, there's a huge [responsibility] on us to make the whole application user friendly," Har-Noy said. "We have found there is tight correlation between the intuitiveness of the app and the quality of information that we receive."

Similar thinking went into developing GeoEye's iPad app, Elevating Insight.

"We initially built the app because we the saw the iPad as a great format for interacting with our imagery and data to answer complex questions in a straightforward way," said Todd Bacastow, GeoEye's senior manager of strategic market analysis and a member of the USGIF Young Professionals Group. [GeoEye combined with DigitalGlobe as of Feb. 1, 2013. Todd Bacastow will continue his work within the new organization.]

ELEVATING INSIGHT features an interactive magnifying glass function that allows users to see the detail in GeoEye's high-resolution satellite imagery.

GeoEye provides imagery from company-owned and operated commercial satellites, accompanied by up-to-the-minute geospatial information and analysis about events around the world.

A 2005 graduate of Penn State's College of Information Sciences and Technology, Bacastow joined GeoEye in 2010.

"Developing the app was a way to test technologies while serving a purpose for sales and



TOMNOD INC. FOUNDERS Albert Lin, Luke Barrington, Shay Har-Noy, and Nate Ricklin discuss the future of GEOINT innovation at their office in downtown San Diego.

marketing," Bacastow said. "The collecting of imagery and analysis to provide context shows the breadth of GeoEye's capabilities. At recent tradeshows, the app drew people into our booth and then it was easy for us to start a conversation with them about our services."

While the app served primarily as a marketing tool, Bacastow hopes users will see its practical applications as well.

For example, the app could be used to make resource allocation decisions related to natural disasters.

"It could help decision-makers answer the question, where do I put my people and equipment to mitigate risk or respond to a situation?" Bacastow said. "Our app models how a first responder could use a mobile device to assess the situation."

From Bacastow's standpoint, managing the development of Elevating Insight was a great opportunity to create a truly original app.

"[Developing the app] required someone to take initiative and own it," Bacastow said.

He advises fellow young professionals to find an opportunity that aligns with their company's goals and identify a solution: "That's what allows young professionals to be recognized."

Certainly that's been the case for the mobile apps development team that Peter Spano has led at Booz Allen Hamilton for the last two years. Four of the people on his team of six were under 30.

An associate at BAH since 2008, Spano said initially he "started out all alone on the island of mobile development." However, as the demand for apps increased, so did the size of his team, which primarily develops apps for the U.S. government and DoD.

"For us, this is bigger than creating a piece of software," Spano said. "There's a bigger picture there. Lives are at stake."

He added that the fast-paced nature of mobile app development will likely appeal to younger GEOINT professionals. "What makes mobile app development so exciting, especially for younger generations, is that mobile apps can be created in two to three months, and then you see the direct results from deployment."

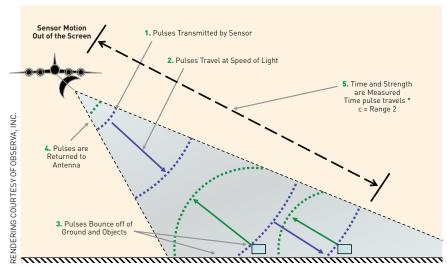
For apps to be deployed successfully, Spano said, "We can't lose sight of the fact that humans are using them. They must be aesthetically pleasing and responsive."

From Spano's perspective, "Mobile app development is still very much a new field. There's so much opportunity. Don't be afraid to be creative and inventive." **BY APRYL MOTLEY**

AN INTRODUCTION TO RADAR IMAGING

What it is and how it works

by Thomas Ager, lead radar engineer for NGA IT Services, Content Integration Division



RADAR PULSES TRAVEL at the speed of light, bounce off of the ground and objects, and return to the antenna.

RADAR IMAGING SYSTEM can be thought of as an echo measurement system. The radar antenna emits thousands of pulses of microwave radiation and measures the characteristics of associated echoes. The radar determines the range between the antenna and the reflecting object, the amplitude of the return wave, and its phase. That is, the radar can determine if the wave returns at its peak or trough, or somewhere in between. These measurements of range, amplitude, and phase are processed together to form images and many other useful products.

The ability to penetrate clouds is the core advantage of radar imaging. Radars emit pulses of microwave energy, which have long wavelengths in comparison to sunlight, and are unaffected by cloudcover, dust, and gas in the atmosphere. Radar is the only remote sensing technology that can almost guarantee collection regardless of weather.

OTHER USEFUL RADAR PROPERTIES

- Sunlight Not Needed: Radar does not need sunlight for illumination; it can be configured to collect images at any time of the day or night.
- Flexible Collection: Radars can be designed with flexible collection capabilities. A single system can support high-resolution imaging over small areas, medium-resolution over medium areas, or low-resolution over large areas.
- Multiple Microwave Bands: Radar imaging supports collection in different wavelength bands. Many systems employ X-band radiation with pulse wavelengths of roughly three centimeters, but other wavelengths are possible. For example, P-band radar has a wavelength of about one meter, which is so long that the energy penetrates vegetation and can be used to image through foliage.
- Controlled Polarization: Radars control the orientation, or polari-

zation, in space of the emitted waves. They are designed to image in specific polarizations, or even in multiple polarizations during the same imaging operation. Images of different polarizations record different reflectance patterns, which may reveal surface structure content, such as crop types or drainage patterns.

- Coherent Illumination: In contrast to the random illumination of sunlight, radar energy is emitted in a controlled manner in which the wave and frequency patterns are consistent. This natural coherence means the radar data can be used to generate special products such as 3D global elevation grids and models of very slight changes in ground-surface structure over time.
- High Resolution: The technique called Synthetic Aperture Radar (SAR) permits high-resolution imaging from any distance.

SAR IMAGING

In the early days of radar imaging, the challenge was to achieve useful resolutions in the range and crossrange dimensions of the image. Good range resolution

relies principally upon the properties of the transmitted waveform. But the early imaging radars, so-called real-aperture radars, had cross-range resolutions of hundreds of meters, and this degraded as the distance between the sensor and the ground increased. While larger antennas improved resolution, it is not possible to build antennas large enough to provide good cross-range resolution for real-aperture radars.

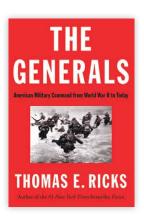
The SAR technique, invented in the early 1950s, overcomes this problem by using the flight direction of the sensor to simulate, or synthesize, a large antenna. The individual transmit and receive cycles of the SAR imaging operation are completed from different locations as the sensor moves. The locations are treated as array elements of a single long antenna strung out along the flight direction. This SAR "trick" uses the long synthesized aperture to achieve fine cross-range resolution while the smaller physical aperture provides for a wide field of view.

Modern space-based commercial SAR systems, such as Cosmo Skymed, RADARSAT2 and TerraSAR-X, orbiting at approximately seven kilometers per second, and imaging for two-and-a-half seconds in high-resolution mode, have a synthetic aperture of 17.5 kilometers. A physical antenna of that size is inconceivable.

THE VALUE OF RADAR IMAGING

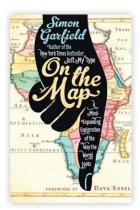
Radar imaging systems can image through almost any weather condition, and they have several other useful remote sensing capabilities. In particular, the precise measurement of phase, which is fundamental to SAR, is simply not available to passive remote sensing systems. Despite the fact that SAR imaging is well outside the human experience, the opportunities it offers are powerful and far-reaching. We look forward to the next generation of scientists, engineers, and innovators to unleash the full potential of a technology that was invented more than 60 years ago.

READING LIST



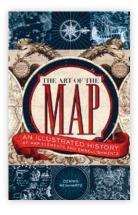
THE GENERALS: AMERICAN **MILITARY COMMAND FROM WORLD WAR II TO TODAY**

by Thomas E. Ricks Ricks sets out to explain why history has been kind to the American generals of World War II, and less kind to the generals of the wars that followed. In part, he describes the story of a growing disconnect between performance and accountability. As one colonel in the book describes it, a general who loses a war today is likely to suffer fewer consequences than a private who loses a rifle.



ON THE MAP: A MIND-**EXPANDING EXPLORATION OF THE WAY THE WORLD LOOKS**

by Simon Garfield This book is a collection of short narratives featuring the history of cartography. Garfield awakened readers to the world of fonts in Just My Type. Now, he delves into the world of maps, exploring their role in evolution, exploration, modern history, and how they reflect the best and worst of what makes us human.



THE ART OF THE MAP: **AN ILLUSTRATED HISTORY OF MAP ELEMENTS AND EMBELLISHMENTS**

by Dennis Reinhartz Here, the history of mapping is told through illustration, highlighting the embellishments on maps, such as monsters, ships, newly discovered flora and fauna, godlike beings, and fantasy descriptions of natives, as well as what these embellishments reveal about the world during the time in which they were created.

PEER INTEL

AGI has hired Jeff DeTroye, a retired CIA officer and former commander of the NRO's Aerospace Data Facility-East, the largest NRO ground station. DeTroye will serve as AGI's vice president for special programs. DeTroye brings almost 20 years of senior executive managerial and leadership experience in both the government and industry, with expertise in management and execution of spaceflight operations, space systems acquisition, and acquisition and operation of complex IT systems.

The SI Organization announced Barry Barlow will join the company as CTO. Barlow recently retired from NGA as director for Online GEOINT Services. Barlow previously served as director of NGA's Acquisition Directorate, where he was responsible for the development and deployment of the National System for Geospatial-Intelligence (NSG) worldwide. He has also served as NGA's chief architect, NGA's chief engineer, and program manager for the NSG.

Wiser Company promoted Eric Nelson to vice president of Intelligence Programs. In addition to his promotion, Nelson will be added to the Wiser Operations Committee. Nelson joined Wiser in 2011 and most recently served as Intelligence Analysis

division manager. Nelson is a retired U.S. Marine Corps allsource intelligence analysis officer. Wiser also announced that Jack Kincaid joined the company as executive vice president of strategic development. Under Kincaid's leadership, Wiser looks to expand its position in the geospatial intelligence, information solutions, and civil solutions markets.

The eastern chapter of the National Geospatial-Intelligence Alumni Association (NGAA) held its first meeting at NGA headquarters in Springfield, Va., Nov. 5, providing alumni with a chance to tour the facility, meet Director Letitia Long, and reminisce with former colleagues. The formal program included the presentation of the NGAA-East Employee Excellence Award to Ronda Schrenk, deputy division chief, Office of Time-Dominant Operations. The program also featured Dr. Larrie Ferreiro, director of research, Defense Acquisition University, who discussed his book, Measure of the Earth. Following the formal program, members saw a demonstration of applications from the NGA GEOINT App Store. The event was the first time many alumni visited the new campus. NGA plans to host spring and fall seminar events each year both at the Springfield, Va., and St. Louis, Mo., campuses.





MARCH

12

GEOINTeraction Tuesday Maggiano's, Tysons, Va.

14

YPG OpenStreetMapping Session USGIF Headquarters, Herndon, Va.

25-26

SAR/EO Training PACOM, Hawaii

MAY

April 30-May 1

Technical Workshop Wright-Patterson Air Force Base, Ohio 8-9

ABI Forum (TS/SCI) NGA Campus East, Springfield, Va.

14

GEOINTeraction Tuesday Maggiano's, Tysons, Va.

20-23

GEOINT Community Week various locations, Northern Virginia

JUNE

4-5

NGA Tech Showcase West & SAR/EO Training NGA Campus West, St. Louis, Mo.

JULY

9

GEOINTeraction Tuesday Maggiano's, Tysons, Va.

18-19

Technical Workshop Denver, Colo.

SEPTEMBER

10

GEOINTeraction Tuesday Maggiano's, Tysons, Va.

OCTOBER

13-16

GEOINT 2013 Symposium Tampa Convention Center, Tampa, Fla.

USGIF

2013 Applications Now Available

USGIF Scholarship Program



USG9F Scho

USGIF

Recognizing Leadership for the Present and Future ...

USGIF is dedicated to assisting promising students interested in the geospatial sciences with scholarship awards to further the advancement of the geospatial intelligence tradecraft. USGIF hopes to inspire students interested in all that GEOINT has to offer.

The Scholarship Program provides the opportunity to invest in the future of this incredibly exciting and relevant field of study.

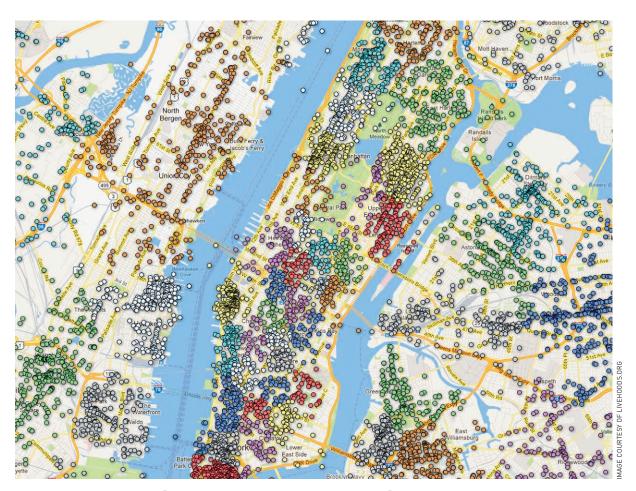
- The Scholarship Program is open to graduating high school seniors, undergraduates, graduates and doctoral students.
- All scholarship recipients are chosen based on their academic and professional excellence in a field related to the geospatial intelligence tradecraft.

For more information on the USGIF Scholarship Program or to apply, please visit usgif.org/education/scholarships

Application Deadline: April 19, 2013

Build the Community | Advance the Tradecraft | Accelerate Innovation

usgif.org



Geotagging Cities

This image of Manhattan is one of seven city maps created by Livehoods, a research project from the School of Computer Science at Carnegie Mellon University, which studies the dynamics of a city by analyzing social media. The Livehoods mission is to map and understand the character of urban areas throughout North America. By combining Google Maps with check-ins from more than 4 million users on popular social media sites such as Twitter and Foursquare, Livehoods analyzes the ever-changing undercurrents that comprise a city, including geography, demographics, economic resources, and cultural habits. Each dot signifies a check-in destination and is assigned a color. A cluster of dots with the same color represents a "livehood," or dynamic area of the city. When clicked on, each livehood has a list of its top five check-in locations, as well as the top five unique things to do in the area. These factors can be monitored to discover how the urban landscape changes over time. With the growing number of location-based apps available on smartphones, Livehoods is just one example of how mobile GEOINT applications are making a splash in the commercial world and have many considering how the same technology can be applied to the defense and intelligence sectors.

To learn more about Livehoods, visit www.livehoods.org.

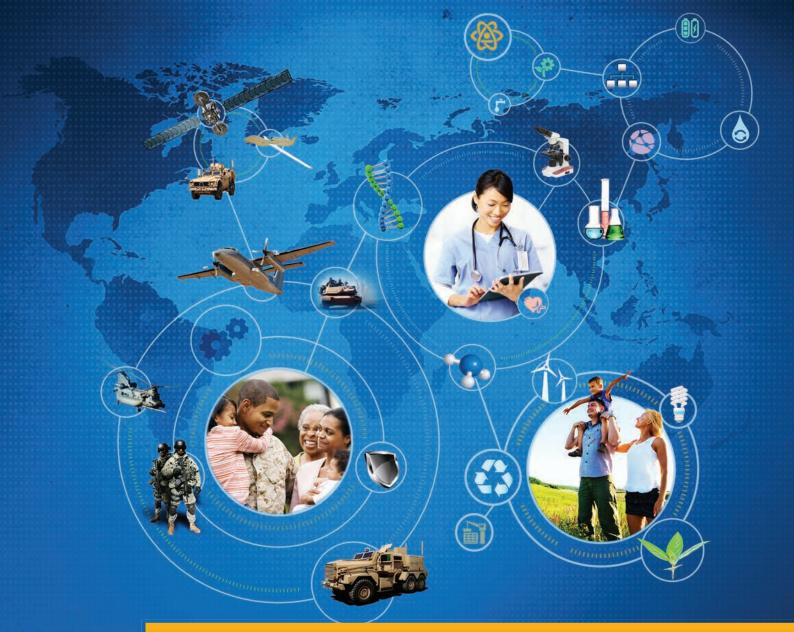
−by Lindsay Tilton

....



At L-3 STRATIS, we help organizations make the technological and cultural changes needed to implement their vision. Our innovative cyber, intel and next generation IT solutions enable your mission, while reducing costs and improving the user experience.

Find out more. Contact GEOINT.STRATIS@L-3com.com or visit www.L3STRATIS.com



Committed to Securing the Future

For Our Families | For Our Communities | For Our World

For over 40 years, SAIC has strived to deliver the innovative solutions that help protect freedom across all domains—air, land, sea and space. We are also passionate about protecting the environment and identifying ways to make energy smarter, cleaner and more reliable. And we are advancing technologies that help improve patient care, reduce cost and enhance public health.

SAIC is committed to protecting freedom for generations to come.

That is how SAIC is securing the future.

For detailed information, visit saic.com/securingthefuture

