Q&A with Virginia Tech’s Tim Sands
In-Q-Tel’s Matt Strottman on AI and Machine Learning
CGI Federal’s Tim Hurlebaus

Big Data, Big Opportunities

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Kate Doerksen is an entrepreneur. An innovator. And a victim of patent trolls. Her startup company, Ditto, is exactly the kind of vulnerable small business patent trolls prey on. Each year patent trolls extort billions of dollars by suing or threatening to sue entrepreneurs and innovators big and small. Troll lawsuits forced Kate to lay off employees and pay for lawyers instead of investing in new products. It’s time to shut down the patent troll extortion racket.
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Celebrating Innovation in our Region

By Bobbie Kilberg

Virginia and the National Capital Region are a global center for technology innovation, with a thriving ecosystem of entrepreneurs, investors, leading companies, nationally-recognized K-12 schools and institutions of higher learning, and a highly-educated workforce. Unfortunately, it sometimes seems like the innovation coming out of our region is one of our best kept secrets.

During our recent review of NVTC’s strategic priorities and in our planning for 2017, we have heard from many companies that our region needs better branding to showcase the innovations developed here and the companies growing here. The region has an opportunity to highlight how our proximity to and long-standing relationship with the federal government is a selling point, not a negative, and to encourage investors, customers and partners to look to companies in our region when they need innovative solutions to their technology challenges in both the public and commercial sectors.

Our expanded efforts to celebrate our region’s strengths kicked off this November at our inaugural Capital Cybersecurity Summit (see article on pg. 10). The event brought together hundreds of thought leaders, experts and practitioners to discuss important topic and trends in cybersecurity in both the government and commercial markets and to highlight how companies in our region are providing unmatched capabilities and developing innovative cyber solutions to meet cyber challenges across the globe. The content was exceptional.

This Capital Cybersecurity Summit helped grow the visibility of our vibrant cyber ecosystem and we plan to build on this conference in future years to increase national and global awareness of our region’s unparalleled cyber assets and capabilities.

Building on the success of the Cyber Summit, NVTC is hosting our inaugural Capital Data Summit on February 15 in Tysons Corner. The 2017 Capital Data Summit will feature keynote speakers and panels offering unique insights on how big data and analytics are transforming industries and driving results for organizations and their customers. The Summit will also include a technology showcase at which the region’s big data and analytics companies will promote their products and services, network, and connect with potential customers, partners, investors and employees.

Northern Virginia and the Greater Washington region are home to a rapidly growing number of firms that generate significant revenue from creating, analyzing and using data, and providing the tools and skills needed to support the big data and analytics ecosystem. In addition, the region’s expertise and experience serving federal, state and local government customers, our knowledge-based workforce, and our many outstanding institutions of higher learning make us uniquely positioned to leverage the growing demand for big data and analytics services and solutions.

As we begin the New Year, NVTC is excited to build upon our efforts to promote our region’s unmatched technologies, talent and academic institutions. We’re delighted to kick off 2017 with the Capital Data Summit and showcase why this region IS the Nation’s Big Data Capital. To learn more about the Summit’s content and how your company can sponsor, exhibit or attend the Capital Data Summit, visit www.capitaldatasummit.com.
Big data is something that we’ve all heard about in many different contexts. Usually you see the term bandied alongside words like “torrent” or “flood” or “wave.” The reason people are talking about torrents and floods is that we’re all massive generators and consumers of data. Ninety percent of the world’s data was created in the last two years. We have collectively created 9x more data than in all of prior human history…and the pace is increasing. Remember when it seemed reasonable to buy the 16GB version of the iPhone? Or going back even further, do you remember when Hotmail used to give you a 10MB inbox?

Big data has certainly gotten a lot of press. But the real news is about the technology that has grown out of this data explosion: artificial intelligence (AI). While a lot of articles are starting to be written about AI, most people don’t recognize the impact AI is already having on their lives.

**The Current AI Revolution**

You may have heard of the term machine learning (ML). As the term explains, machine learning is teaching computers or machines to do some task. Imagine that we want to teach a computer to recognize faces. The first step that a classically trained ML specialist might do is to try and understand what differentiates faces from one another. This specialist might decide that what matters is the length of the nose, the spacing between the eyes and whether the ears are level or not. The specialist would write a computer program to calculate these “features” and then would create an algorithm to differentiate people’s faces based on these features. Until about five years ago, this methodology was state-of-the-art. And the results were middling.

Enter deep learning (DL). The premise behind DL is simple. Using our face recognition example, instead of iteratively selecting and testing model features (such a distance between your eyes), the specialist needs to provide the DL machine with examples of each person’s face. The machine can then determine the differentiating factors between the faces and optimize the model appropriately. Part of the DL magic is this automatic feature extraction. This technology is not new (it has been around since the 1960s), but for a number of years this methodology simply didn’t work. Now, it does work due to big data.

You see, these DL models require a lot of training data, for example, a thousand images of a person’s face or 500 images of a breed of dog. Training data in those volumes were previously nonexistent. But they are today. As a result, fields as disparate as natural language processing (teaching computers to read), computer vision (teaching computers to see) and audio analysis (teaching computers to hear) have undergone massive improvement. That’s why Apple’s Siri can understand search queries and Facebook can automatically tag people in pictures. It’s also the reason why we’ll likely be riding in self-driving vehicles and having our packages delivered by drones in a few years.

At In-Q-Tel and our Big Data Lab, Lab41, we’re excited about this rapid technological progress. We’re chipping away at understanding what these DL models are actually doing and whether we can trust the results from these black boxes. But we’re not waiting around for those answers. We’re actively investing in companies that are leveraging this technology to solve real problems and thrilled to see what the Virginia technology ecosystem develops over the next few years.
On Oct. 24, about 700 members of the Northern Virginia technology community came together to celebrate NVTC’s 25th anniversary at TechCelebration: NVTC’s annual banquet.

NVTC Chair Todd Stottlemyer, president and CEO of the Inova Center for Personalized Health, and NVTC President and CEO Bobbie Kilberg led a special ceremony highlighting many of NVTC’s achievements throughout its first 25 years and recognizing NVTC’s past Board Chairs and Board members who, through their leadership and dedication, have guided NVTC’s direction and promoted its growth. Nine of the ten living NVTC former Chairs gathered onstage to be honored. In order of their service, they are: Ed Bersoff, Dave Lucien, Mike Daniels, Kathy Clark, John Backus, Sudhakar Shenoy, Donna Morea, Brad Antle and Sudhakar Kesavan.

NVTC’s past Board Chairs were then joined onstage by the daughters of Earle C. Williams and past winners of the Earle C. Williams Leadership in Technology Award: Paul Lombardi, Alan Merten, Mario Morino, Marge O’Deen, representing Phil O’Deen, and John Toups. Williams was a technology pioneer and visionary in the region and one of NVTC’s founders. He was an exceptional leader of our community’s business, educational and cultural institutions. He was also a Veteran who believed deeply in America and in supporting the men and women who have served in our Armed Forces. In honor of Williams, the group onstage generously contributed almost $50,000 to the newly established Earle C. Williams Fund, which benefits the NVTC Veterans Employment Initiative through the NVTC Foundation.

The event also featured Steve Case, chairman and CEO of Revolution, who accepted the Pinnacle Award for his outstanding leadership and contributions in the Northern Virginia

In his remarks, Case credited NVTC for supporting the growth of the region’s technology community over the last 25 years. He shared his thoughts on the three waves of entrepreneurship; the first that built the Internet; the second that built the apps and services on top of the Internet; and the coming third wave, the “Internet of Everything.” This new wave is stimulating partnerships that will transform the way industries such as healthcare, education, transportation and agriculture operate and innovate, with fewer overnight successes. Case described the rise of Northern Virginia and the Greater Washington region as an epicenter of innovation and how our region can succeed in the third wave by leveraging the strengths of the community to foster a powerful innovation ecosystem.

TechCelebration also included the presentation of the 2016 NVTC Tech Awards, which honored groundbreaking companies, leaders and innovations (see sidebar on page 6 for finalists and winners) in our region’s technology community, and the new Veterans Employment Initiative Veteran Service Award. See article on page 12.

NVTC’s 25th Anniversary Honored by Fairfax County Board of Supervisors

NVTC’s 25th anniversary was honored by the Fairfax County Board of Supervisors at their Oct. 18 meeting. The Board of Supervisors presented NVTC with a formal resolution recognizing NVTC’s 25th anniversary and accomplishments over the last 25 years.

Fairfax County Board of Supervisors Chairman Susan Bulova, NVTC President & CEO Bobbie Kilberg, Inova Center for Personalized Health CEO and NVTC Board Chair Todd Stottlemyer, Supervisor Pat Herrity, NVTC Special Assistant to the CEO & COO Cindy Stegmeier and NVTC Vice President of Communications and Strategic Initiatives Allison Gilmore at the Oct. 18 Fairfax County Board of Supervisors meeting honoring NVTC’s 25th anniversary.

Fairfax County Board of Supervisors Chairman Sharon Bulova, Supervisor Pat Herrity and Supervisor John Cook made remarks praising NVTC for its contributions to the Northern Virginia technology and business community. They also recognized NVTC’s advancements in driving a strong and innovative policy framework at the state and local level. Herrity was an early NVTC leader, serving on NVTC’s Board for many years. NVTC Board Chair Todd Stottlemyer spoke at the meeting and thanked the Board of Supervisors for this honor.

NVTC Co-Hosts Reception to Support Arlington Computer Science Teachers

In recognition of National Computer Science Education Week, NVTC joined CodeVA and Starbucks in hosting a special reception on Dec. 7 at Starbucks Pentagon Row where technology professionals from NVTC member companies met with Arlington County computer science teachers to facilitate the exchange of ideas, develop new mentor relationships and promote collaborative opportunities to better prepare the region’s technology workforce pipeline. Participating NVTC member companies included CTA, GMU, LiveSafe, Micron, Monster, NVCC, Robbins-Gioia and Telos.

NVTC is committed to building our computer science-literate workforce. Prior to 2014, fewer than 10 percent of schools in Virginia offered computer science, and fewer than one percent of students took a computer science class before graduating. NVTC supported state legislation initiated by CodeVA and Microsoft in 2016, which now requires that Virginia’s Standards of Learning (SOLs) include computer science and computational thinking, including computer coding. Over the past two years, Arlington Public Schools has made great strides in adding computer science courses and content. Today, more than 600 students in Arlington are enrolled in computer science classes. Many of Arlington’s teachers are new to the subject and are seeking mentorship and support to develop a 21st Century workforce pipeline.
Sen. Mark Warner and CEOs of Care.com and Handy Address On-Demand Economy at Titans

On Sept. 15, members of the region’s technology community gathered for a Titans breakfast featuring Sen. Mark Warner (D-Va.), Oisin Hanrahan, co-founder and CEO of Handy, and Sheila Lirio Marcelo, founder and CEO of Care.com. Warner, Hanrahan and Marcelo made separate remarks on the changing nature of work in the 21st century economy before sitting down for a Q&A session with the audience.

Sen. Warner discussed the transformative nature of the on-demand economy and how this new economy has been made possible by mobile and GPS technologies combined with advanced algorithms. Our current social insurance system where benefits are tied to an individual’s employer, according to Warner, is not sufficient to support today’s workers. He expressed his belief that we must redesign the social contract to provide on-demand workers with flexible and portable benefits.

Care.com’s Sheila Marcelo also supported the need to decouple benefits from employment. She shared expanded benefits now being offered to Care.com caregivers, including portable and affordable options for health and dental insurance, as well as retirement, unemployment and workers compensation benefits. She also highlighted how the platformization of the on-demand economy is helping to bring stability, flexibility and legitimacy to independent workers. Marcelo expressed her hope that on-demand employers like Care.com can begin to create career pathways, including training, networking and professional development opportunities, for their workers.

Oisin Hanrahan of Handy began his remarks by comparing the rise in on-demand services to The Jetsons, where anything was available at the push of a button, and expressed the need to get more people to work in this new workforce. He discussed the motivation for those working in what he calls the flexible economy, including freedom, empowerment...
and impact. Hanrahan argued that we need solutions to leverage the technology to create not only opportunities for these workers, but also protections.

The event closed with Q&A from the audience, during which Sen. Warner, Hanrahan and Marcelo answered questions relating to the industry’s talent needs, how to promote diversity in the workforce and how unions could play a role in facilitating portable benefits for on-demand economy workers.

Higher Education Center Dedicated to Northern Virginia Community College President Emeritus and NVTC Board Member Dr. Robert Templin

On Sept. 8, Northern Virginia Community College (NOVA) honored NVTC Board member Dr. Robert G. Templin, Jr., its fourth president, by naming a higher education building at its Loudoun Campus after him in recognition of his dedication to education in the region and nation.

At the ceremony, NVTC President and CEO Bobbie Kilberg gave remarks recognizing Dr. Templin’s contributions in fostering STEM education to fuel technology innovation and entrepreneurship in the region.

“Bob focused on the power and future of technology innovation, entrepreneurship and company creation,” she said. “He set down markers for K-12 students to be STEM literate and focused on STEM careers and he turned NOVA into an educational powerhouse, respected and admired throughout this country,” Kilberg shared.

Also in attendance were Dr. Tony Tardd, former Loudoun Campus provost; Dr. Angel Cabrera, president of George Mason University (GMU); and Dr. Scott Ralls, current NOVA president.

Dr. Templin thanked those who worked alongside him at NOVA and said that the work is not done. The Higher Education Center is just the first step in the process. The goal is to have other universities present where NOVA students can complete their baccalaureate and beyond while remaining in the region and not having to commute great distances.

“Thank you for your friendship, partnership, dedication and your selflessness to a very, noble cause.” Templin said. “And thank you to the NOVA family for the privilege of working alongside you for a dozen years doing the most important and incredible work that one could ever ask to be a part of.”

PSC President and CEO David Berteau Addresses NVTC Board

Professional Services Council (PSC) President and CEO David Berteau participated in a meeting of the NVTC Board of Directors on Sept. 13.

Berteau shared his views on how to bring innovation to government, referencing the goal of making “government smarter tomorrow than it is today.” He discussed trends in R&D spending as well as barriers to entry in contracting, including restrictive requirements set by government agencies and long-range funding cycles. Addressing the growing awareness of the need for change in how government contracts for technology services, Berteau credited the role of contractors in identifying and delivering opportunities for innovation to their government customers and broader recognition that, without changes to support government innovation, the United States will lose some of its global competitiveness. He argued that we need users’ voices to be heard in the contracting process and that the focus should shift to outcomes and results.

Berteau also answered questions from Board members in which he shared his insights on scaling innovation that already exists in certain pockets of government, how to promote the government as a good testing ground for new ideas and products, and how to engage with the presidential transition team and the new administration on the need for innovation in government. He also highlighted why he thinks our region will continue to have the edge in winning government business, particularly because companies here can tap a globally competitive workforce, have specialized understanding of the government customer and its end users, and have a focus on public service.
On Nov. 2-3, NVTC hosted the inaugural Capital Cybersecurity Summit at The Ritz-Carlton, Tysons Corner. With over 400 attendees, remarks by Virginia Governor Terry McAuliffe, Virginia Senator Mark Warner, Northrop Grumman Mission Systems’ President Kathy Warden and RSA President Amit Yoran, panel sessions led by cybersecurity experts from the public, private and academic sectors, and a top technology showcase, the Summit highlighted the Greater Washington region’s unique set of cybersecurity assets.

The Summit kicked off on Nov. 2 with an evening reception, which included opening remarks by Gov. McAuliffe. In addressing the audience, Gov. McAuliffe stressed the importance of cybersecurity and a strong cyber workforce in driving the Virginia economy. He highlighted Virginia’s coordinated efforts to address cyber hiring shortfalls through education initiatives and partnerships with Virginia’s state universities.

The Nov. 3 Summit program was emceed by the Capital Cybersecurity Summit Steering Committee Chair John Hagan, managing director and co-head of Security, Defense and Government Services for Raymond James. Sen. Mark Warner provided welcome remarks to kick off the day, speaking to Virginia’s unmatched stance as a hub for cybersecurity innovation and education. Sen. Warner noted Virginia’s critical need to bolster its cybersecurity workforce and called for new national cybersecurity legislation, including national standards for data breach notifications.

After Sen. Warner’s remarks, there was a special video message from Northrup Grumman CEO Wes Bush, followed by keynote remarks by Northrop Grumman Cor-
porate Vice President and President of Northrop Grumman’s Mission Systems Kathy Warden. Warden discussed the evolution of cybersecurity as the “Fifth Domain,” a fundamental element, permeating all aspects of our daily lives. She also stressed the critical need to fill cybersecurity positions in Virginia and the opportunities for public, private and academic sectors to partner together to find creative solutions to address these hiring shortages.

The morning program also included three panel sessions, Collaborating for Cyber Success, Force Multipliers to Cybersecurity and Investment Capital for Cyber. These sessions featured lively discussion from cybersecurity leaders from the private sector, top cyber incubators, universities and investors.

Amit Yoran, president of RSA, provided the program’s second keynote. Yoran reinforced the evolution of cybersecurity and the expansion of the cyber threat area into business and our daily lives. He stressed the need to develop new flexible, perimeter-less cybersecurity to meet growing threats from mobile and IoT expansion. Yoran explained that the Greater Washington region, with its unmatched research and expertise, is equipped to meet these new cyber demands. In fact, according to Yoran, the region has the potential to be “Security Valley.”

The second half of the day included six panels in two tracks addressing government and commercial cybersecurity, as well as a special closing session from Verizon that took a deep-dive look into the current cybersecurity threat landscape and highlighted cyber-attack statistics in the Verizon 2016 Data Breach Investigations Report.

Visit NVTC’s blog at blog.nvtc.org for more Capital Cybersecurity Summit content and videos. nvtc
NVTC Presents First Veterans Employment Initiative Veteran Service Award to The MITRE Corporation

On Oct. 24 at TechCelebration: NVTC’s 25th anniversary banquet, NVTC presented The MITRE Corporation with the inaugural NVTC Veterans Employment Initiative (VEI) Veteran Service Award sponsored by Monster and Military.com. This new award honors an NVTC member company that has demonstrated a superlative level of engagement with VEI and support for the Veteran and military community. The 2016 finalists were Dominion, The MITRE Corporation and PRISM, Inc.

VEI Task Force co-chair, Steve Cooker, executive vice president of Monster Government Solutions, and David Lucien, founder and CEO of DCL Associates, kicked off the award presentation by introducing Virginia Secretary of Veterans and Defense Affairs Admiral John Harvey. Admiral Harvey spoke to Virginia’s efforts to become the most Veteran-friendly state – efforts that have leveraged strong public, nonprofit and private partnerships with organizations like VEI. With the fastest growing Veteran population and the largest percentage of Veterans in the workforce in the country, Admiral Harvey stressed that Virginia has an unmatched opportunity to lead the nation in Veteran hiring. He noted that the 5 percent of NVTC member companies that are V3-certified have hired over 5,000 Veterans. He challenged the audience to become V3-certified.

Admiral Harvey announced MITRE as the recipient of the 2016 VEI Veteran Service Award. MITRE Senior Vice President for Aviation and Aerospace Lillian Ryals accepted the award on behalf of MITRE and was joined on-stage by many dedicated MITRE team members.

“All of the finalists are creating scalable Veteran hiring programs and have engaged their employees in supporting transitioning Veterans. MITRE has been a strong VEI leader – as one of VEI’s founders, as program lead for VETWORKING and as an active VEI Task Force participant. We are grateful for MITRE’s dedication to Veterans and for the example they are setting in their own Veteran hiring and training initiatives,” noted VEI Director Steve Jordon.

“Monster and Military.com are proud to help recognize these employers who are committed to Veteran recruitment, hiring and retention. Working with NVTC to showcase the best practices in this area will help inform other employers in their efforts to hire Veteran talent,” said Greg Smith, president of Military.com and retired Navy Admiral.
**NVTC Veterans Employment Initiative Honored by V3 at Virginia Workforce Conference**

On Sept. 28 at the Virginia Workforce Conference in Richmond, NVTC was honored by the Virginia Department of Veterans Services with the V3 Commonwealth Award.

The Commonwealth Awards are presented to strategic partners and supporters of the Virginia Values Veterans (V3) Program who have made significant contributions to the operation, strategy and mission of the V3 Program and who have used their expertise to help make Virginia the most Veteran-friendly state in nation to work.

NVTC staff and volunteers have been extremely proud to partner with the Department of Veterans Services and the V3 Program to make this happen.

NVTC companies have been responsible for over 5,000 of the 20,000 hires.

Gov. McAuliffe also recognized Virginia businesses and organizations with the V3 Governor’s Awards, including NVTC members CACI, Virginia Department of Corrections and Virginia Department of Labor and Industry, for their ongoing commitment to creating employment opportunities for Virginia’s Veterans.

Additional NVTC member companies and organizations were recognized with the V3 Perseverando Award. They were: Dominion, Prism, Inc., Stratford University, Virginia Department of Human Resource Management, Virginia Employment Commission and Virginia Economic Development Partnership.

**VEI Hosted Largest Employer Recruiting Event at Ft. Myer on Nov. 2-3**

On Nov. 2 and 3, VEI, in partnership with Virginia Values Veterans (V3), hosted the Veteran Employer Transition Summit (VETS) at Ft. Myer in Arlington, Va. The event was the largest on-base hiring event to-date for private employers to meet with transitioning Veterans. VEI was selected by the Military District of Washington to run the event.

VEI Director Steve Jordon organized a speaker series featuring NVTC member companies and their HR professionals dedicated to supporting and hiring transitioning Veterans. Participating member companies, CyberHC, ICF and IntelliDyne, offered over 300 transitioning Veteran attendees insider knowledge into finding work opportunities, connecting with recruiters and marketing their unique skill sets. Marine Veteran and IntelliDyne CEO Tony Crescenzo offered the keynote remarks to the uniformed attendees.

The Summit also featured a recruiting event in which 27 NVTC and V3-certified company recruiters connected with over 100 service members in a face-to-face career “speed-dating” setting to match their talents to open job positions.

Contact VEI Director Steve Jordon at sjordon@nvtc.org to find out how your company can participate in future recruiting events.

**VEI Launches NoVaTechVets.org Recruiter Contest**

Win a Microsoft Surface Pro! The first VEI Recruiter Contest will take place Jan. 9 - Feb. 16, 2017. The contest aims to promote the use of NoVaTechVets.org, a free NVTC Veteran talent resource created by Monster.com to connect NVTC member companies with job seeking Veterans.

* The recruiter with the most Veteran resume searches on NovaTechVets.org during the contest will win a new Microsoft Surface Pro!

* Recruiters who create new accounts on the site will be entered to win restaurant gift cards each week!


**VEI Expands Its Impact and Deepens Partnerships in 2016**

Now in its third year, VEI continues to expand its impact in making it a priority of every technology company to hire, train and retain military Veteran employees. VEI’s mission can only be accomplished by strong collaboration among NVTC member companies, state government organizations and military bases in the National Capital Region. VEI thanks its engaged member companies for accelerating Veterans’ transitions to civilian life by providing better employment opportunities in Virginia’s technology community. Join us in celebrating VEI’s accomplishments in 2016:

- 111 participating NVTC member companies
- 5,000 Veteran hires by V3-Certified NVTC companies
- 464 active recruiters on novatechvets.org
- 8,000 jobs posted on novatechvets.org
- 950,000 Veteran resumes accessible on NoVaTechVets.org
- 56 VETWORKING sessions hosted
- 5 Recruiting Days hosted attended by 222 job seekers
Looking to Get Your Company Involved in the VEI? Here are Some of the Top Ways Employers can Bolster their Veteran Hiring Efforts through VEI:

1. Sign up for an account on NoVaTechVets.org: NVTC members can access a resume database of over 950,000 Veteran resumes, post job openings and use the latest tools to find the right candidates.

2. Become a VEI supporter by making a donation to the NVTC Foundation to benefit VEI.

3. Become a sponsor of VEI’s Sporting Clays Tournament which raises funds for the NVTC Foundation to support VEI.

4. Host and upcoming Recruiting Day or sign up to recruit Veteran talent at one of these events.

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Monster and Military.com Release 2016 Veterans Talent Index Survey

On Nov. 10, Monster Worldwide Inc. and Military.com released their 2016 Veterans Talent Index survey illustrating over five years of data from Veterans and employers on Veteran recruiting, hiring and retention. The survey also stressed the growing role nonprofits (like VEI) serve as pipelines to Veteran candidates for employers. Here are some statistics that stood out in the Veterans Talent Index:

- **78%** of employers surveyed responded that Veteran skills are relevant to civilian careers; but **48%** of employers want a better translation of military skills into jobs.

- **53%** of Veterans are seeking organizations that are “Veteran-friendly.”

- **43%** of employers have Veteran-specific mentoring programs in place, up from **26%** in 2014.

- **39%** of Veterans are trying to figure out what to do for their next career.

The survey highlights opportunities for NVTC member companies to reach more Veteran candidates, improve Veteran retention and inspire Veterans to join emerging career paths. Learn more and read the full 2016 Veterans Talent Index at bit.ly/VetsIndex.

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**VEI Scholarship Internship Program**

VEI is preparing for its second annual VEI Scholars Summer Internship Program. The program provides student Veterans from 14 NVTC member colleges and universities with professional mentoring and meaningful work-based experiences at NVTC member companies. Submit internships and identify your skill set needs now at NoVaTechVets.org.

Questions? Email VEI Director Steve Jordon at sjordon@nvtc.org.

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**Stay Connected**

VEI Website: www.nvtc.org/veterans

NVTC Foundation: foundation.nvtc.org

Job Board: NoVaTechVets.org

Email: VEI Director Steve Jordon at sjordon@nvtc.org

Twitter: @nvtcvei

NEW! VEI YouTube Channel: bit.ly/VEIYouTube
NVTC NextGen Leaders Committee Launches Mentor-Protégé Program and Releases Research

The NVTC NextGen Leaders Committee brings together the future leaders of the technology industry in our region. The committee's goals are to build a regional community of the future leaders for the technology ecosystem; provide content rich events and programs to allow for discussions around the next generation workforce and industry and regional trends; connect senior executives and early career professionals to provide cross-generational insights on careers, industries, leadership, corporate strategy and challenges; and provide a forum for companies to share leading practices for recruiting and engaging early career professionals.

The NVTC NextGen Leaders Committee has been moving quickly to add value for early career professionals and companies within the NVTC membership. This past year, the committee has held multiple activities - the two most significant being millennial research and the creation of an NVTC mentor-protégé program. Updates are provided below on these two recent efforts. Stay tuned for more updates in 2017.

Mentor-Protégé Program
By Jon West, ePlus Group Inc.

The NVTC NextGen Leaders Committee has launched a new mentor-protégé program to provide an opportunity for students and young professionals from NVTC member companies to connect with industry leaders from the NVTC membership.

Managers and executives today are struggling to meet cross-generational desires and needs in their organizations. The millennial generation is bringing new perspectives that will require fundamental changes to operational norms within organizations. Additionally, millennials desire mentors that will help them move forward in their careers. The mentor-protégé program was built to satisfy these needs.

The new program provides a unique opportunity to connect generations with a mix of one-on-one mentoring, special events with keynote speakers and job fairs. These events will provide an opportunity for millennials and seasoned executives to connect, grow and create lasting relationships by sharing their knowledge and experiences in a group atmosphere of confidentiality, trust and respect.

Learn more about how you can participate as a mentor or mentee at bit.ly/NVTCMentorProtege.

New Research Summarizes What Attracts and Retains Millennials in the Workplace
By Josef A. Kauzlarich, The MITRE Corporation

The research subcommittee of the NextGen Leaders recently took on a project to answer the questions "What attracts millennials to a company?" and "What increases their loyalty once they have been hired?" Some interesting points from the report include:

- Like their Gen X and baby boomer colleagues, financial security and compensation are highly important to millennials. Compensation is a driving factor for why millennials choose to stay in an organization and companies should work hard to fight the mentality that "job hopping" is the best way to gain increased compensation. Currently, millennials are dissatisfied with their financial positions in Northern Virginia but are optimistic that their situations will improve as they advance in their careers.

- Millennials place strong emphasis on flexibility in their positions – in their schedule, in the physical location of their job and in their responsibilities.

- A company’s social responsibility efforts and commitment to being ethical is critical for millennials; millennials place strong value in the trust they have for their employer, their transparency and commitment to bettering the world.

The research also brought to light that millennials are naturally disloyal to companies. Instead, millennials are highly conscious of their personal values and have loyalty towards companies who share those same values. Millennials use these values to guide their career paths – often to multiple organizations throughout their early career years.

However, there are many steps companies can take to increase millennials’ loyalty, like ensuring compensation is adequate or better than other companies, advancing millennials within the organization through promotions, opportunities for training and creating a flexible work environment that goes outside of traditional working norms.

The report contains more information that companies can use to benchmark their current environment to see how well they are postured for attracting and retaining millennials. The full report is available at bit.ly/MillennialReport16.
Join the Discussion

Connect with Your Fellow Members on Engage!

Network, collaborate and communicate with other members on Engage, NVTC’s newly launched members-only web platform. NVTC members can share ideas, discuss challenges, post questions, contact other members and much more!

With Engage, you won’t have to wait until the next NVTC event to network with your NVTC peers … connect with them 24/7 online.

Start collaborating today at engage.nvtc.org.

Engage is an exclusive benefit for NVTC members. Email membership@nvtc.org to ensure your company’s membership is up to date so you can take advantage of this valuable collaboration and information-sharing tool.

$avings & Discounts

NVTC members have a unique marketing advantage over non-member companies through NVTC’s member-to-member discount program. Through a variety of advertising and promotional vehicles, the Member Advantage program can facilitate business relationships between your company and other NVTC companies, potentially boosting sales and industry exposure.

And, it’s affordable.

For details visit www.nvtc.org/membership

The Importance of Soft Skills

Our first survey to regional technology employers focused on the positions and functional areas that were in the highest demand in our region. This survey identified the top five technology areas: software development, cybersecurity, big data and analytics, data centers and cloud infrastructure, and network systems.

We then interviewed a cross-section of NVTC’s technology employers to drill down to the granular needs that support those five highest demand functional areas, drawing out what recruiters are looking for in their hiring process from soft to hard skills and other factors such as citizenship and security clearances.

The information gained through the interviews was used to create a final survey for Greater Washington technology employers, which asked them to rank the importance of various skills in their hiring decisions for all five functional areas.

Dependent upon your perspective, the results of the final survey might be considered shocking: soft skills “communication – written and verbal” and “problem solving and critical thinking” were ranked first and second respectively for all five functional areas. In fact, there was only one area, data centers and cloud infrastructure, were a tech skill, “review analytics,” was ranked in the top three.

Perhaps unsurprisingly, the primary research’s identification of the top five in-demand functional areas for our region matches the analysis of data found in existing public data streams such as from BLS and Virginia LMI. A close examination of BLS data streams shows that Northern Virginia’s workforce is dominated by the technology sector, specifically the “professional, scientific and technical services” category, with more than twice the number of workers than the next closest category, retail trade. In addition, the report includes a gap analysis comparing the long-term workforce training and education needs of the region’s technology sector and the pipeline of qualified individuals coming out of associated postsecondary education programs within the region. The largest gap identified is for the Software Developers, Applications occupation, representing a gap of 800 job openings compared to the 600 qualified workers our region creates annually.

The top 10 positions employers noted difficulty staffing are:

1. Software developer, systems software
2. Software developer, applications
3. Information security analyst/architect/engineer/specialist
4. Computer systems engineer/architect
5. Computer network architect
6. Computer programmer
7. Data analyst/engineer/scientist
8. Business intelligence analyst
9. Information technology project manager
10. Network and computer systems administrator

Workforce Pipeline Development Call to Action

Our data, analysis and findings from this needs assessment are being shared with educational providers, including our Greater Washington Technology Workforce Needs Assessment report lead sponsor, Northern Virginia Community College (www.nvcc.edu). It is our hope that this information will be useful in the development of curriculum and content that aligns with our region’s business needs in order to create a workforce pipeline that is able to meet both the capacity and the competency requirements that are driving our regional economy.

In addition to sharing our findings and analysis with regional educational providers, we will use these results in our Tech Talent Initiative (www.nvtc.org/TechTalent), including working with our members to create the NVTC Tech Talent Employer Collaborative (TTEC). The TTEC will be a key player in the Tech Talent Initiative deployment of the U.S. Chamber of Commerce Foundation’s Talent Pipeline Management (TPM) methodology.

Check out www.uschamberfoundation.org/talent-pipeline-management for more information on TPM.

This work also will take a very close look at cybersecurity skills through a new partnership with the Business-Higher Education Forum (BHEF), where, amongst other activities, we will create a cybersecurity competency road map/career pathway.

For more information or to help direct the development of our workforce pipeline, please contact John Shaw at jshaw@nvtc.org.
Big Data, Big Opportunities

By Mark Toner

Photographs by David Kidd

Chiny Driscoll, right, founded MetiStream with Donna Fernandez: “Two years ago, very few government organizations understood what big data really meant.”
As the nation’s capital becomes the nation’s data capital, technology companies are focusing on big data and analytics.
Government, think tanks, the alphabet soup of intelligence agencies, and large financial, healthcare and hospitality companies—the D.C. region is not just the nation’s capital, it is arguably the nation’s data capital.

Companies in this region alone churn out 771 terabytes of new data daily, according to a 2014 survey conducted for NVTC by Chmura Economics & Analytics. That’s roughly 65 billion pages of new information a day, every day, and the amount of data continues to grow exponentially.

“The one piece that is staggering to me is that 90 percent of the world’s data has been generated in the past two years,” says Beth Hiatt, chief operating officer of Reston-based Unissant.

Small wonder, then, that the market for technology and services to collect and make sense of all this data—known colloquially as “big data”—continues to grow. Eighty-seven percent of the companies in the region that responded to the NVTC survey have active big data and analytics projects or are planning them.

“Big data was in the right place at the right time,” Hiatt says. “For organizations to remain competitive in their industry, they have no choice but to leverage the technology.”

For the region’s technology companies, the federal government’s recent push into the big data space provides new opportunities, even as overall government spending continues to decline. “Two years ago, very few government organizations understood what big data really meant,” says Chiny Driscoll, founder and CEO of MetiStream and co-chair of NVTC’s Big Data and Analytics Committee.

That’s changed. The White House hired the federal government’s first chief data scientist last year; many agencies have since followed suit by creating C-suite chief data officer (CDO) positions. All told, the federal government spent an estimated $1.6 billion on big data initiatives in 2015, according to research by the Fairfax County Economic Development Authority. That amount is expected to grow 3.2 percent by the end of the decade.

“We’ve seen a significant change in [the federal sector’s] interest around these core big data and analytics service offerings,” Driscoll says, predicting more growth in the federal marketplace over the next 12-24 months. One example: earlier this fall, Reston-based analytics startup Zoomdata received a strategic investment and technology development agreement from In-Q-Tel, the Central Intelligence Agency’s venture capital arm.

While the region’s technology sector has historically focused on the federal market, big data is unusual because of the presence of significant local activity in a number of commercial sectors—finance, healthcare and hospitality among them. And, at the same time as technology giants like IBM are focusing on big data as a key strategic play, a growing number of local startups in the big data space also are emerging, often led by executives with considerable experience in the sector.

“Data has always been at the heart of technology and the companies that work with it. The mainframe databases of the 1960s and 1970s were replaced by the client-server technologies of the 1980s, and ultimately, the massive cloud-based repositories we see today. At the same time, our collective understanding of how to work with data has matured.

“Eight years ago, we were struggling with the basics—let’s understand our data and ensure it’s of high quality,” says Unissant’s Hiatt, who previously served as Fannie Mae’s chief data officer. “Now we’re focused on how to deal with the massive amounts of data and the various types of data being collected today and make sense of it.”

Even as the cloud and other technologies have made it possible to amass previously unthinkable amounts of information, there’s also a growing recognition that size isn’t everything. “There’s this idea that, if your data set is big enough, you’ll be able to answer any question,” says Tom Woteki, senior vice president and chief architect of MAXIMUS Federal Services. “Can you find the needle in the haystack? If you make the haystack big enough, you’ll probably find it. But whether you’re actually understanding a question so that you’re not confusing correlation with causality… is not just [about] the size of the data.”

That’s why, when people talk about big data today, they’re usually not just talking about big data—they’re talking about big data.
BIG DATA, BIG OPPORTUNITIES

Unissant’s Beth Hiatt: “The one piece that is staggering to me is that 90 percent of the world’s data has been generated in the past two years.”

and advanced analytics. Think of advanced analytics as business intelligence on steroids—often broken into predictive analytics (what might happen), prescriptive analytics (what the best course of action might be) and cognitive analytics (why that action makes sense).

The shift has been dramatic. According to a survey conducted by IBM, just 10 percent of organizations were using advanced analytics in multiple parts of their operations in 2014. One year later, nearly three-quarters—71 percent—were, particularly in areas like risk and financial management that can take advantage of large pools of data to find that proverbial needle in the haystack.

For companies like Zoomdata, the opportunity is to present this kind of analytic information in ways that are easy to understand. The Reston company creates dashboards that automatically pull information from existing repositories in real time.

“Customers with hundreds of billions of rows of data in a database want to see them in five seconds,” says Russ Cosentino, Zoomdata’s vice president of channel sales. “The days of the one-time-a-day Excel or PDF spreadsheet are done.”

Other technical aspects of big data also are maturing, including the ability to combine information from multiple data sources. “To attack some of the problems that companies and organizations like to be able to attack, you have to combine diverse sets of data,” Woteki says. “It’s often in very large volumes, but it’s the combination that’s difficult.”

As a result, the big data marketplace is becoming easier for technology companies to navigate. “In the early years, they really could have been talking about anything, in terms of the volume of data and the kinds of projects they’re doing with it,” says Pamela Arya, cofounder and CEO of McLean-based Optensity. “Now when someone says they have a big data project, the landscape is much more structured. In some ways, it makes it easier to be in the business.”

At the same time, the emergence of open-source solutions for storing and analyzing big data provides both opportunities and challenges for technology companies and their customers. The
MAXIMUS’ Tom Woteki: “It’s about using the data to make better decisions, improve services, and become more productive.”
The emergence of open-source solutions for storing and analyzing big data provides both opportunities and challenges for technology companies and their customers.

At the same time, using technology to unleash the power of big data allows organizations to do new things—or the same things in better ways. To understand how big data can unlock opportunities for government, for example, look beyond the Beltway—way beyond the Beltway.

In Texas, the city of Austin realized that while government is organized vertically—parking tickets, building permits, zoning regulations, and police and fire services are all organized in different departments—people engage with it horizontally, as they tap into different services at different times. Several years ago, the city began working on a strategy to pull together information from these disparate departments to better understand the needs of the people who live there. First up was an effort to identify troubled properties that generated not only the most 911 calls, but also the highest number of code violations and other demands on the city so it could take a more holistic approach to addressing them.

Similar approaches to using data in new ways are taking root across the public sector, including at the federal level—where an emphasis on opening data to the public adds an additional wrinkle. With the creation of CDO roles, federal agencies are not only trying to make better use of the data they’ve compiled themselves, MAXIMUS’ Woteki explains. They’re also trying to open disparate public records up to others who may be able to leverage them for new purposes.

“There are typically two focuses—capitalizing on data internally and, as part of the federal open data movement, to afford an opportunity for companies to create economic value using that data,” he says.

One key challenge to this shift doesn’t involve technology. As with all large organizations, information in government agencies often is siloed not just across different data repositories, but also across different parts of the org chart. Addressing turf battles and preventing the hoarding of data is as much of a leadership challenge as a technical one, says Jake Bittner, president and CEO of Reston-based Qlarion, which has worked with Austin on developing a strategy focused on analytics and with the state of Massachusetts to use technology to ferret out fraud across a range of financial systems.

“There has to be leadership,” Bittner says. “We find that the organizations that are really ready to embrace data-driven government are led by a leader who understands that and drives change throughout the organization.”

Along with the public and private sector, technology companies focused on big data and analytics also have a third customer base—themselves. By bringing big data to bear on their own operations, technology companies can get a better understanding of costs that can help them prepare better bids—and provide better service.

“It’s about using the data to make better decisions, improve services and become more productive” MAXIMUS’ Woteki explains.

As an example, MAXIMUS uses analytics to look at call volume, wait times and other data to generate optimal staffing strategies for the call centers it operates for state agencies, according to Woteki. “Given an expected volume of calls and wait times, we then use analytics and simulations to determine how many call agents would be used to support that number of calls,” he says.

“We’ve evolved so we could become more efficient.”
We’re all used to hearing about jobs that didn’t exist a decade ago. “Data scientist” is near the top of the list, and the skills that fit that job description speak to the challenges of finding the right people for big data and analytics work.

“You need data scientists to understand the insights in your data, and that’s not going to change no matter what tools you have,” says Optensity’s Arya. “And that’s a skill that’s in high demand.”

That could be an understatement. Career site Glassdoor calls data scientists the most desirable position nationwide, in large part due to the availability of jobs, and the demand extends to skilled workers across the sector. The region’s big data firms anticipated hiring more than 20,000 people between 2014 and 2017, according to NVTC’s study. Of those, nearly 17,000 will be in Northern Virginia, and more than two-thirds will focus specifically on big data and analytics, the survey said, requiring highly specialized expertise.

“There’s a very high premium on the people with the kinds of skills required here,” Woteki says. “Some are very technical—knowing of and being able to employ various algorithms, machine learning techniques, statistical analyses and the core tools one needs to be able to deploy in those situations.”

More than 9,300 degrees in big data and analytics-related fields were awarded in 2014, according to the Fairfax County Economic Development Authority, and most of the region’s colleges and universities now have specialized degree programs, institutes or centers focused on big data, analytics, and business intelligence (see box, p. 27). However, supply hasn’t yet caught up with demand, experts say. “We still need more people,” Qlarion’s Bittner says.

The region’s technology backers argue that the combination of the federal government and private sector companies in healthcare, finance and other growing fields make the region an attractive one for workers with big data and analytics expertise. By virtue of the government and its attendant think tanks and institutes, the D.C. region also has a high proportion of statisticians and other data-focused experts.

“To me, it’s a simple conversation to have,” Unissant’s Hiatt says. “It’s a great area in terms of the opportunities and the capabilities that are being deployed in this space. It’s not a tough sell.”

At the same time, technology leaders caution that companies can’t take any of this for granted. “Companies need to invest in the talent pool,” Driscoll says. “We have good people, but you have to invest in and cultivate that.”

To understand some of the other challenges companies working with big data are now facing, consider how much information the various social networks you engage with over the course of a week gather about you—your browsing habits, your network of friends and business associates, your purchasing habits, even your personal beliefs. Combining these disparate streams of information is an area of concern, but big data’s underlying technology also has ways to help ensure data is being kept secure and used ethically.

Metadata—in essence, data about the data—can be used to ensure greater accuracy and control over who can access what information, an area of particular emphasis in the financial sector and government. “All the basics around data quality and governance still remain important and shouldn’t be lost in the deployment of big data capabilities,” Hiatt says. The ability of modern analytics solutions to access data where it is stored instead of creating their own static copies also can help ensure that data remains more secure. “Because we’re running queries on the data where they sit, we’re not shipping data around,” Zoomdata’s Cosentino says.

Yet many of the issues of data privacy and ethics remain unresolved. In the absence of clear regulation, company leaders must think carefully about the data they’re working with and take responsible steps to ensure it’s being safeguarded and used in responsible ways, experts say.

“It comes down to an ethical culture each company has to build,” MAXIMUS’ Woteki says. “It’s not the only answer to the question, but it’s certainly an important one.”

While the impact of new open-source technologies may transform big data and analytics over time, they also pose immediate challenges for technology companies working in the space.

“It’s becoming cheaper to compete in this space,” Qlarion’s Bittner says. “You may have a large investment in a technology that could quickly have a much cheaper competitor.”

As with other sectors that have been impacted by the open source movement, big data and analytics providers must think carefully about their business. “It’s hard to compete with free,” MetiStream’s Driscoll says. Companies must identify the complex business problems they want to solve and the services that differentiate them, she adds: “It’s not enough to just say you do big data and analytics.”
Optensity’s Pam Arya: “You need data scientists to understand the insights in your data, and that’s not going to change no matter what tools you have.”
Differentiation also means that companies will need to partner with each other more closely, according to Driscoll. “The big data environment evolves really quickly, and there are a lot of moving pieces,” she says. “Not every company can do everything. Relationships and partnerships from a business opportunity perspective are areas we all need to cultivate.”

The need for stronger relationships presents opportunities for companies and organizations like NVTC to promote the region’s big data and analytics infrastructure and find ways to encourage collaboration. “It’s important to put forth our big data and analytics skills as a group to show how strong they are, how broad they are, and how deep they are,” Optensity’s Arya says. And what may matter most is the region’s broad experience across multiple sectors.

“We have the vision to define this new standard of how people access data,” Zoomdata’s Cosentino says.

Mark Toner is a Reston-based technology writer.
Big Data and Higher Ed

The region’s higher education institutions offer many specialized programs in big data and analytics.

George Mason University

**Degree programs:** BS in Computational and Data Sciences; MS in Computational Science; MS in Geoinformatics and Geospatial Intelligence; MS in Data Analytics Engineering; PhD in Computational Sciences and Informatics; PhD in Computational Social Science

**Certificate programs:** Graduate Certificate in Data Analytics Engineering; Graduate Certificate in Data Science; Graduate Certificate in Data Journalism; Graduate Certificate in Computational Social Science

**Other:** DataLab

**For more information:**
Computational and Data Sciences: cos.gmu.edu/cds
DataLab: datalab.gmu.edu
Volgenau School of Engineering: volgenau.gmu.edu

The George Washington University

**Degree programs:** MS in Data Science; MS in Management of Healthcare Informatics & Analytics; MS in Business Analytics (MSBA)

**Certificate programs:** Graduate Certificate in Data Science; SAS Business Analytics Certificate

**Other:** Center for Data Analysis and High Performance Computing Laboratory

**For more information:**
Business Analytics Program: business.gwu.edu/programs/specialized-masters/m-s-in-business-analytics
Data Science Program: datasci.columbian.gwu.edu

University of Virginia

**Degree programs:** MS in Data Science; MS in Commerce; MS in Statistics; Accelerated Masters Program in Systems Engineering

**Other:** Big Data Institute; Executive and Continuing Education in Data Science

**For more information:**
Data Science Institute: dsi.virginia.edu
Department of Commerce: commerce.virginia.edu/ms-commerce/business-analytics
Department of Statistics: statistics.as.virginia.edu/master-science
School of Continuing & Professional Studies: scps.virginia.edu
Systems Engineering Program: amp.sys.virginia.edu

Virginia Tech

**Degree programs:** BS in Business Information Systems; BS in Computational Modeling and Data Analytics (CMDA); Online Masters of Information Technology; MS in Computer Science; MS in Electrical and Computer Engineering

**Certificate programs:** Graduate Certificate in Data Analytics

**Other:** Discovery Analytics Center; Center for Business Intelligence and Analytics; The Social and Decision Analytics Laboratory

**For more information:**
Analytics @ Virginia Tech: analytics.cs.vt.edu
Center for Business Intelligence & Analytics: cbia.pamplin.vt.edu
Discovery Analytics Center: dac.cs.vt.edu
Social & Analytics Decision Laboratory: bi.vt.edu/sdal
Master of Information Technology Program: vtmit.vt.edu
Department of Computer Science: cs.vt.edu

Marymount University

**Degree programs:** BS in Information Technology with a specialty in Data Science

**Certificate programs:** Post Baccalaureate in Data Science

**For more information:**
Data Science Specialty: marymount.edu/Academics/School-of-Business-Administration/Undergraduate-Programs/Information-Technology-(B-S)/Program-Requirements/Information-Technology-(B-S)/Concentrations/Computer-Science-(1)
Data Science Post Baccalaureate: marymount.edu/Academics/School-of-Business-Administration/Undergraduate-Programs/Post-Baccalaureate-Certificate-Programs/Data-Science

Northern Virginia Community College

Coursework in statistics

**Other:** Cybersecurity Center: nvcc.edu/cybersecurity/index.html

**For more information:**
Bernard Schmidt, bschmidt@nvcc.edu
“We want our students and our faculty to be able to use data from heterogeneous sources, put them together in a way that really transforms data into actionable information.”
Can you share background on Virginia Tech’s focus on big data and analytics?

Over the last year, we’ve identified five themes that cut across the entire university as an opportunity for our students to enrich their experience through cross-disciplinary coursework in and experiences. One of them is data analytics and decision science. It’s hard to argue that there’s any corner of the disciplinary spectrum that we offer at Virginia Tech that does not benefit, or could not benefit, from an emphasis on both data analytics and decision science. We’ve got a new plan for what we call a global business and analytics complex which is a physical manifestation of that, but it’s really about an opportunity to bring data and decision science to every discipline, to every corner of the university.

The reason that we chose [data analytics and decision science] is that we also have strength in that area. We’ve got the Biocomplexity Institute, the Discovery Analytics Center, the School of Public and International Affairs, we’ve got a computational modeling and data
analytics curriculum, and we’ve got presence in the National Capital Region which for us is a great opportunity. It’s the largest decision hub in the world. So we feel like we’re in a great spot to make data and analytics a theme of the Virginia Tech experience and Virginia Tech’s impact.

When we think of the National Capital Region, everything surrounding the federal government and all of the entities that have collected data around it, it’s about taking complex high dimensional data and turning that into policy. If there’s ever a place that could use the intersection of high dimensional data and decision science to develop policy, you have that incredible concentration in the National Capital Region. We want our students and our faculty to be able to use data from heterogeneous sources, put them together in a way that really transforms data into actionable information. And then to be able to provide that actual information to the decision maker in the form of material and content that that person or that group can digest and use as essentially the background for the decision that they’re going to make.

“We [need to ask] the question what problem are we trying to solve, are we trying to make life better for people in a particular situation or are we just trying to build a technology that is fancier?”

nvtc In your recent State of the University address, you talked about Virginia Tech’s Destination Areas. Can you explain what those are and why they’re so important to your vision of the university’s future?

The Destination Area is the next transformation of the structure of the university. At Virginia Tech and other like institutions maybe 15 or 20 years ago, we started to create institutes focused almost entirely on interdisciplinary research. They generally did not have an undergraduate curricular component to them and weren’t designed to interface with society. They were more about generating research strength and they are great at bringing together disciplines to take on complex problems in the research space.

The Destination Area is a broader idea. It’s about truly transdisciplinary themes that cut across all of the corners of the university, that bring in the policy people, the artist, the engineer, the technologist, the scientist in a very broad way, but also inform the development of our curricula for undergraduates or graduates and the way that we interact with society.

Global system science, the adaptive brain, intelligent infrastructure, integrated security, and data analytics and decision science—those are the five Destination Areas that we’re starting with. We chose them because they’re areas where we have four, five, six, maybe more groups that are known nationally to be leaders that are not connected despite the fact that they’re under this big umbrella. What we’re trying to do is connect them and project that strength outward in order to engage partners who are working in the same general space but who can fill in and compliment our strengths and weaknesses.

So, in a lot of ways, the Destination Areas are an outwardly facing structure that is designed to bring talent and partners to Virginia Tech. From an inward point of view, it is an opportunity to develop cross-cutting curricula and research engagement in areas that we know are going to be important for the foreseeable future.

One of the most compelling aspects to the conversation that we’ve been having on campus is about thinking of these Destination Areas in terms of the human condition that we desire to improve. If we think about it in the context of the human condition, you end up with a different and more holistic perspective.

We [need to ask] the question what problem are we trying to solve, are we trying to make life better for people in a particular situation or are we just trying to build a technology that is fancier? We want to transition from just building the technology and really move toward this idea of which problem are we going to solve and for whom and why are we doing it.

nvtc You’ve been making investments in unmanned systems and intelligent infrastructure. Why are these emerging industries important for Virginia Tech?

Take the example of intelligent infrastructure for human-centered communities. It’s about Virginia Tech connecting its strengths and then looking for partners. We partnered with a company called Flirtey and a medical clinic and NASA to deliver the first medical supplies to a remote location in Wise County in Southwest Virginia.

Of course, you may have heard about the burrito deliveries that we were involved in with Project Wing, Alphabet and Chipotle through the Mid Atlantic Aviation Partnership (MAAP). And we got a lot of press and it was a lot of fun to deliver burritos to our students. We delivered over a thousand of them. Students signed up, went to a tent a couple of miles from campus and over the horizon after you ordered your burrito, there it came delivered by a drone.

The point wasn’t to deliver burritos to hungry students. It was building and managing a fleet of several aerial systems working together in semi-autonomous flight to coordinate the safe and efficient delivery of burritos and then look at the customer reac-
Q&A with Virginia Tech President Tim Sands

tion and feedback. It was about taking that first step toward autonomous flight control system without requiring constant human intervention to deliver goods in a safe, timely manner with aerial systems adapting to each other in the sky.

The key to this project is scalability. Yes, you can do that with human pilots, but in order to make this scalable, it has to be semi-autonomous. You have to be able to say, this is where the object is going to be delivered, this is when and you have to let the system recognize where the conflicts are and react dynamically. We were watching our burritos being delivered and there were some wind gusts—it was really fascinating to see these devices adapt to the wind and make their way over to that spot and do it in a way where they weren’t interfering with each other.

So, although we got a lot of press for delivering burritos, it was really more about the first steps in understanding autonomous flight. And partnerships. You can’t do this just as one entity. Virginia Tech couldn’t have done this alone. We really needed to do this with partners who were experts in their domains.

nvtc Can you share with our readers any updates on the team of Virginia Tech students that will be competing in the SpaceX Hyperloop Pod Competition in January?

Our students were one of 125 groups that competed for generating a pod design that would work with the Hyperloop concept and we came in number four, so we made the finals.

Their team is called Vhyper and they had just announced a partnership with Apex Systems Center for Innovation and Entrepreneurship in the Pamplin College of Business. This is a partnership with some of our alums and some industry folks who have been working on creating and fostering an entrepreneurial mindset at Virginia Tech.

The students are learning how to work in a multi-disciplinary team, how to organize a project and get it done and leveraging partnerships to make it possible. These are valuable skills for life after graduation.

I’m actually quite impressed with the Vhyper pod concept but, regardless of how this works out, the students who were involved will look back on it and say that was one of the most important things they experienced at Virginia Tech and one of the most relevant experiences to whatever it is that they’ll be doing in the future. This project definitely exemplified two of our catchphrases on campus: “invent the future” and “hands on, minds on.”

nvtc How does Virginia Tech support innovation and entrepreneurship among its students and faculty?

We have a minor in entrepreneurship and I mentioned the Apex Systems Center for Innovation and Entrepreneurship. You may also know about the entrepreneurship team living/learning community that’s called Innovate. All of the students involved are interested in entrepreneurship and we have an entrepreneur in residence who stays in the residence hall with the students for a few days or a week and then rotates out. While they’re there, they have a chance to interact with students and our students have a chance to ask questions, learn about their network and how to get things done, and have them critique their business plans.
But, when I think of entrepreneurship in a broader sense, I look at the skills that our students are learning and developing while they’re involved in an entrepreneurial activity. It’s not about so much starting a company as an end goal, but it’s really more about learning how to communicate with others whose backgrounds are different than your own, learning how to take multiple disciplines and integrate them in the team and how to take advantage of the knowledge that each team member has. It’s learning how to reduce data to actual information, to sell your ideas quickly and efficiently, and learning how to get the word out in an efficient and compelling way. I think those are skills that every student needs for career resilience regardless of whether they get involved in a startup or become a traditional entrepreneur.

We know that our students are going to be hopping from one job to another, one career to another, one passion to another. In order to do that fluidly, in order to not get stuck in something that isn’t really allowing you to realize the impact that you know you’re capable of, you need to build up some degree of confidence that you failed before and you managed to survive and gone on to the next big thing. In order to do that confidently, you need to have built those skills of how to work in a team, how to sell your work and to make a compelling case. Those are the kinds of skills that we’d like to build up across the institution for all of our students, not just for the students who are involved in entrepreneurship directly.

"All of our majors, regardless of discipline, have a technology component because I don’t think there is a field right now that doesn’t benefit from technology. These days, the technology is part of the preparation."

We’re kind of running off that with the VT-shaped student where the V represents essentially the experiential part of the education, where you learn something in your traditional classroom environment but you never really learn it until you apply it in real life. So the V is about experiential learning, it’s about problem solving, it’s about a commitment to service and spirit.

We’re committed to, not too far in the distant future, ensuring that all of our students are VT-shaped when they graduate. It’s a substantial commitment to the institution and for the student. It means that they all have some realistic experience that reinforces what they’re learning in the classroom and that they’ve all worked on a complex problem in a team.

All of our majors, regardless of discipline, have a technology component because I don’t think there is a field right now that doesn’t benefit from technology. These days, the technology is part of the preparation. So we’re trying to make sure that our students have those experiences while they’re at Virginia Tech, that they’ve immersed themselves in the tools and technology, and that they’re continually upgrading those skills.

We [also need to] do the complimentary part, which is making sure our traditional STEM graduates understand the human context of what they’re doing. The STEM versus non-STEM polarity, which was great ten years ago, has been oversold. If we really look at the kinds of careers that our students are more likely to have now, it’s going to be a mix of social science and technology or, as Thomas Friedman coined the phrase STEMpathy, in other words understanding the human condition. Are you developing this technological system because it’s cool or is it because you’re solving a problem for someone? You can practice your skills and empathy to understand what that issue really is and now you’re going to find a solution. Let’s bring technology into every discipline, let’s bring human condition into every discipline and make sure our students, wherever they are in that spectrum, have both.

*vtc* You’ve called the VT-Shaped Student the cornerstone of your vision. Can you briefly explain the concept? You have probably heard the T-shaped student concept, where the vertical line is essentially the discipline, the expertise that you have, and across the top is your ability to work in a team. That might be an entrepreneurship project, research, an internship, studying abroad. But these are situations where you’re working on a complex problem or with people with different skills and different backgrounds.

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*vtc* Virginia Tech has a strong and growing presence in Northern Virginia. What is the strategy for the National Capital Region campus and how can companies in our region engage with the work being done there?

We’ve been involved in the National Capital Region (NCR) for decades. We’re fortunate that we have that presence in Northern Virginia because these days a land grant university that’s located in a relatively rural part of the state needs to complement itself with an urban land grant mission. Not that we have any intention of abandoning our traditional mission, we’re going to grow that. But, at the same time, we have to recognize that the land grant ethos also applies to the urban environment. So we’re fortunate to have that presence in the NCR. As far as going forward in the future we see
Q&A with Virginia Tech President Tim Sands

The Voice of Technology

the NCR as a great opportunity to expand the global reach of our university because the rest of the world is represented up there as well. As we talked about earlier, it’s also the hub of the intersection of high dimensional data, complex data and decision science in the form of policy.

We think we can have even more presence though. I mentioned the VT-shaped student. What we’d like to do is get into a position where our partners in industry, NGOs and governmental agencies, can work with us to provide these internship and externship experiences that will help us create a VT-shaped experience for our students. What better place, in terms of the variety of experiences that could be represented and potential partners, than in the NCR.

The NCR gives us a great opportunity for students to straddle two worlds. You have a base camp in Blacksburg but, for a semester or even a year, you can study and work in the NCR on projects that are directly tied to the curriculum back in Blacksburg. We’re looking for partners that will work with us to create those opportunities for our undergraduate and graduate students.

But, in a broader sense, if you look at our research portfolio, a good portion of that maps extremely well into the needs of the NCR. If you look at the potential for impacting future economy of that region and the world, I think there’s plenty of elbow room up in the NCR to expand the presence of research universities. We already have quite a few, but we’re looking for new comprehensive partnerships with industry and organizations in the NCR that don’t just involve the internship opportunities, but also involve research and engagement.

Our partnership with Qualcomm and the Thinkabit labs at the Northern Virginia Center is an incredible opportunity to instill technology into problem solving for K through 12 students across Northern Virginia and even into Maryland and D.C. As I said, we’re not trying to convert people who really want to study something other than a traditional STEM discipline. What we want to do is make sure that all of our students have that competency with technology.

So the really exciting thing about the NCR for us is that it’s so well suited to the era of big and deep partnerships. Frankly, I can’t think of a better place in the world to do it. So you’re going to see that influence grow, you’re going to see more partners, more Virginia Tech students up there and more research teams based there.

Allison Gilmore is NVTC’s Vice President of Communications and Strategic Initiatives.
Tim Hurlebaus
President, CGI Federal

Favorite NVTC memory:
Seeing Bill Gates give the keynote speech at a Titans Breakfast in 2008.

Value of NVTC membership is:
Providing us a stronger voice in the Virginia and Federal technology markets and the ability to build stronger relationships with our peer technology companies in the region.

Where were you born?
Burlington, Vt.

Where did you go to school?
Purdue University.

How long have you lived/worked in Northern Virginia?
I came here for a great opportunity with American Management Systems and everything the mid-Atlantic region has to offer 28 years ago. For my career I have temporarily lived in Canada, London, New Mexico, Atlanta, Delaware and Kentucky, but I consider the D.C. area my home.

What was your first job?
In my youth, I was part of the grounds crew at an apartment community. I mowed the grass, took out the trash, often shoveling loosely discarded trash and unidentifiable sludge to clean out the trash bins. To this day, I’m careful to make sure every trash bag is tied.

Did you learn anything else from that job that you still use today?
During a storm one summer, a creek overflowed and three basement apartments got flooded. A few of us from the crew helped people move their belongings out of their apartments, with water up to our knees. I remember some of the residents just standing there, crying. Although the work was just maintenance, it was the first time I realized that there is a human element to everything you do.

How does your company stay ahead of the game, in terms of tech innovation?
What’s most important for us is to deliver on the demands of the market. For example, we created a new passive RFID system for the U.S. Marine Corps for management of their assets – everything from vehicles to weapons to supplies they load onto a ship when they deploy. They turned to us to provide new and innovative ways to deliver on their mission. To help drive this kind of digital transformation, CGI has established “Spark Innovation Centers” across the globe for research and development in cloud computing, cybersecurity, IoT, future cities, data analytics and visualization. We also have a global Innovation, Collaboration and Experimentation program that provides seed funding to our project teams for innovative ideas.

What would you imagine are the biggest upcoming technology trends of the next generation?
Everyone talks about digital transformation today. There are more mobile devices than humans on the planet; everyone has everything in their pocket. Helping the government continue a meaningful relationship with citizens in this environment is what digital transformation is all about.

When I was a kid I dreamed of being:
A world explorer like Jacques Cousteau. My grandmother was a farmer and I used to spend summers on her farm. I loved being outside and getting lost in the woods with my brother and my cousins.

If I wasn’t working at my company, I would be:
I’m not one for pondering alternate universes. Every day has its pleasures and pains, but I’m happy with where I am. That said, I love to travel, stay moving and see different places. Experiencing new people and cultures is interesting to me.

What is the best advice you’ve ever received?
“We can do anything but we can’t do everything.” Focus on something and do it well. Make it something for which we as a community can have a shared passion. Assess whether things matter to
your view of life or your priorities. Question whether an action is relevant to the strategy. Maintain perspective. Scrutinize everything that comes across your desk and sort by what matters and what doesn’t.

**When I’m not at work, I like to:**
Be active by walking, playing tennis, skiing, or just exploring with friends and family. I enjoy reading because it’s one of the few times I get a chance to step back from life. Of course, I love following Purdue basketball and football, as futile as the latter may be.

**Last book you read:**
*How to Raise an Adult* by Julie Lythcott-Haims. I also just finished *Hillbilly Elegy* by J.D. Vance. It’s a remarkable story about success despite a very difficult childhood environment. It provides insight into cultures, values and communities that I think would resonate with anyone.

**When I retire I want to:**
Move to Italy on Lake Como next to George Clooney; I hear he’s a lot of fun. If that doesn’t work out, it would be great to stay active in the business and local community. Maybe travel. At some point, way down the road, enjoying grandchildren.

**Three adjectives that best describe you:**
Direct, thoughtful, self-deprecating.

**If you were a superhero, what special power would you possess?**
If I could fly, that would be the best. You’d get anywhere you want to go – no traffic and no elevators.

**Favorite social media tool, if any:**
Too often, social media takes the place of interacting directly with a human being. If I had to pick one, I do occasionally look at Facebook because it’s good way to stay connected with old friends with whom I might have otherwise lost touch. The fact that I call it “the Facebook” is a source of irritation for my children.

**If you could thank one person from your past for the role they played in your life, who would it be and why?**
My grandmother. She was tough, hardworking and generous. She never took herself too seriously and loved to laugh.

**Last movie you saw:**
Still Alice; it was unbelievable. I watched it on a plane, and no kidding after I landed I saw Julianne Moore, right there at the airport.

**Favorite bands:**
The Rolling Stones, REM, U2 and many others.

**Favorite sports team:**
Purdue Boilermakers.

**Favorite podcast or radio show:**
NPR - Kojo Nnamdi and Diane Rehm.

**Top vacation destinations:**
Rehoboth Beach, Del.; Breckenridge, Colo.; London; Tuscany region of Italy.

**What is there about you that your colleagues don’t know?**
I’m pretty much an open book. Fun facts: I have a twin brother and I’m petrified of “Dance Moms” – not the kids, the moms.

**Words of advice for any emerging entrepreneur:**
Engage people in your pursuit who share your passions. My philosophy is to surround yourself with intelligent, thoughtful people. Good things will happen to them and good things will happen to you.

**If you could “talk tech” over dinner with any three people, living or dead, whom would you invite?**
Ted Leonsis, Ben Franklin and Bill Gates.
Explore our new event space available for private functions, including receptions, dinners and interactive culinary experiences. Entertain in a unique atmosphere with an array of seating options, a full bar and an open kitchen. Learn more by visiting ritzcarlton.com/tysonscorner

Nothing provides more lasting memories than a great atmosphere.
The following photos are a snapshot of some of the great networking among attendees at NVTC’s recent events.

TechCelebration: NVTC’s 25th Anniversary Banquet on October 24, 2016

Kathy Clark, Alan Merten of George Mason University and Thomas Hicks III of Dimuro Ginsberg PC

Earle Matthews and Anil Katarki of Hewlett Packard Enterprise Services

Bob Dinkel of Pierce Capital Partners and Rich Montoni of MAXIMUS

Representative Barbara Comstock and Kathleen Barlow of Marsh & McLennan Companies

Lilian Ryals of MITRE and Carol Seltz of Wells Fargo

Carol Ford and Christina Puleo
Join an NVTC Committee Today!

Meet potential clients, build relationships, develop professionally and learn about trends in the technology industry by joining an NVTC committee!

NVTC’s Committees:

- Big Data & Analytics
- Business Development, Marketing & Sales
- CFO Series
- Cybersecurity & Privacy
- Data Center & Cloud Infrastructure
- Health Technology
- HR & Benefits
- International
- NextGen Leaders
- Small Business & Entrepreneur
- Tech Law & Procurement
- Technology Innovations
- Workforce & Education

For more information and to join, visit www.nvtc.org/community or email committees@nvtc.org.
**EXECUTIVE CIRCLE**

**as of 12/7/16**

Manish Agarwal, Attain LLC  
Jay M. Atkinson, AIS Network LLC  
Melchior Baltazar  
Amin Bhat, iQuasar LLC  
Richard Bissonnette, CGI Federal  
Jake Bittner, Qlarion  
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Chad J. Fredrick, ePlus Inc.  
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Alex Hart, Verizon Enterprise Solutions  
Yucatan Hodge, II, General Dynamics Information Technology  
Jeff Irby, LiveSafe  
Mike Jing, CyberData Technologies Inc.  
Mark Johnson, PRISM Inc.  
Bryan Judd  
Perry Keating, Blue Canopy  
Jim Leach, RagingWire Data Centers  
Robin Lineberger, Deloitte LLP  
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Jeffrey Novak, AOL  
Tonia L. Patt, ICF International  
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Al Pisani, Serco  
Norm A. Snyder, III, Aronson LLC  
Frank Vorndran, Morgan Stanley  
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COMMITTEES TO KEEP YOU INFORMED

Networking. Collaboration. Benchmarking. Legislative Updates. More Networking...

Join NVTC’s newest HR & Benefits Committee creating a community of HR professionals from NVTC member companies interested in sharing best practices, collaborating, learning about the latest advancements in human resource management, and staying informed on employee benefit issues including developments and requirements of the Affordable Care Act.

The committee will come together on the second Thursday of every month for informative webinars, events, and networking!

Email committees@nvtc.org to join!

Visit www.nvtc.org/community/hrbenefits.php to learn more.

Take advantage of your NVTC committee access today!
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Mission

The Northern Virginia Technology Council (NVTC) is the membership and trade association for the technology community in Northern Virginia. As the largest technology council in the nation, NVTC serves about 1,000 companies from all sectors of the technology industry, as well as service providers, universities, foreign embassies, nonprofit organizations and governmental agencies. Through its member companies, NVTC represents about 300,000 employees in the region. NVTC is recognized as the nation’s leader in providing its technology community with networking and educational events; specialized services and benefits; public policy advocacy; branding of its region as a major global technology center; initiatives in targeted business sectors and in the international, entrepreneurship, workforce and education arenas; and the NVTC Foundation, a 501(c)(3) nonprofit charity that supports the NVTC Veterans Employment Initiative and other priorities within Virginia’s technology community. Visit NVTC at www.nvtc.org.
## Technology Companies

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## Associate Companies

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<td><a href="http://www.biltgroup.net">www.biltgroup.net</a></td>
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<td><a href="http://www.dimuro.com">www.dimuro.com</a></td>
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<td>ENSO Advisors LLC</td>
<td><a href="http://www.ensoadvisors.com">www.ensoadvisors.com</a></td>
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<td>Enterprise Resource Performance (ERPi)</td>
<td><a href="http://www.erpi.net">www.erpi.net</a></td>
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<td>Offit Kurman Attorneys at Law</td>
<td><a href="http://www.offitkurman.com">www.offitkurman.com</a></td>
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<td>Point West Innovation Group</td>
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<td>SoBran, Inc.</td>
<td><a href="http://www.sobran-inc.com">www.sobran-inc.com</a></td>
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<td>VogelHood Group</td>
<td><a href="http://www.vogelhood.com">www.vogelhood.com</a></td>
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## Affiliate Companies

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<tr>
<td>ByteBack</td>
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<td>The Community Foundation for Northern Virginia</td>
<td><a href="http://www.cfnova.org">www.cfnova.org</a></td>
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<td>General Dynamics</td>
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<td>Andwyrde LLC</td>
<td>Howard Hughes Medical Institute</td>
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<td>The ILEX Group</td>
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<td>LeaseWeb</td>
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<td>Noblis</td>
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<td>Fulcrum IT Services</td>
<td>Northrop Grumman Corporation</td>
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