



JULY 2020 | NAMC MEMBER SPOTLIGHT

ARCHITECTURE, SECURITY, AND MODULARITY
AUTONOMY
COLLABORATION
EXTERNAL SYSTEMS
MOBILITY
MODELING & SIMULATION
POWERTRAIN
SURVIVABILITY
TESTING AND EVALUATION

OpenJaus, LLC.

Neya Systems, LLC.

Northrup Grumman Remotec

Deep Analytics, LLC.

Iguana Technology, LLC.

New Eagle Consulting, LLC.

Jenoptik Advanced Systems, LLC.

Mettle Ops

Nevada Automotive Testing Center (NATC)

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ARCHITECTURE, SECURITY, AND MODULARITY



OPENJAUS, LLC. | Longwood, FL

POC: Danny Kent | danny@openjaus.com | www.openjaus.com |

What is something unique about your product or service?

The OpenJAUS Software Development Kit (SDK) is the only commercially available and fully supported framework for compliance with the Joint Architecture for Unmanned Systems (JAUS). Additionally, our SDK fully supports the Government's Interoperability Profiles (IOP) standards. Our software products have been fully validated and verified by multiple Army and Navy test and validation tools and deployed on multiple Programs of Record.

What capability gaps are you able to fill and which industry colleagues would you like to know about them?

JAUS and IOP can be deceptively difficult to understand and implement for robotics developers. The complexity of the JAUS standards leads to many questions and complex implementation. Our SDK enables reliable, verified implementation of the JAUS and IOP standards. Our products enable organizations to accelerate adoption of these standards for any robotic platform or module.

How did your organization originate?

OpenJAUS began as a work of passion by two leading JAUS experts that wanted to develop a robust solution to JAUS requirements. Based on years of prior work with multiple JAUS implementations, the OpenJAUS SDK was developed to enable rapid development of robotic systems based on the standard. Commercially available JAUS implementations and support were not available and OpenJAUS wanted to fill that void to provide common solutions to the military robotics market to accelerate development of these systems and eliminate re-work.

Capabilities:

Autonomous Navigation & Controls	Cognitive & Collaborative Behaviors	Compliance	Human Machine Teaming			
Interoperability	JAUS	Mobility	Payloads Integration	Perception & Situational Awareness	Sensors	Standards
System Design and Engineering Services						



AUTONOMY



NEYA SYSTEMS, LLC. | Warrendale, PA

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What are your organizational goals?

Our goal at Neya Systems is to deploy autonomy to the warfighter. This has been our goal for the past 11 years, since our founding in 2009. We have taken specific steps to develop a series of autonomy capabilities that range from low-complexity (e.g. GPS waypoint following) to advanced R&D (e.g. fully unguided autonomy in off-road GPS-denied environments), understanding that deployment will occur in a series of steps, increasing in capability and complexity. Our goal is to be a part of each step along this pathway, as we believe 100% that autonomy will save lives on the battlefield.

What is something unique about your product or service?

Our autonomy software is based on a "full stack" approach to off-road autonomy. This includes low-level control, GPS-denied localization, LADAR / Camera / Radar sensor fusion, a multi-level path planner, and a multi-robot collaboration package. These capabilities all use AI algorithms at their core, ranging from traditional search and optimization, to deep learning. Our path planner in particular is tuned to the kinematics and dynamics of each platform, allowing it to operate in densely cluttered off-road environments that few other systems can handle. A key aspect of our autonomy and planning software is its modularity, using ROS/ROS-M, and compliance with IOP, which reduces time and cost of integration onto new platforms.

Our multi-robot collaboration software is designed for low-workload manned / unmanned teaming up to the platoon level to integrate heterogeneous unmanned systems (air, ground, maritime) into a cohesive whole, allowing them to collectively achieve mission performance beyond that of a single unmanned system operated by a dedicated soldier. We use AI algorithms for task decomposition, task assignment, and task scheduling, allowing a soldier to select a mission from a library, assign available unmanned assets and mission constraints, and then monitor the execution of the mission, providing guiding input only when necessary.

What are you most proud of?

We are most proud of our people, and the culture we have created within Neya. Robotics and autonomy is a "hot" space. We have been able to attract, retain, and grow amazing employees at Neya, who have a strong breadth and depth of knowledge on all things autonomy, while also living up to our values of passion, freedom, service, and growth.

Capabilities:





COLLABORATION



NORTHROP GRUMMAN REMOTEC | Clinton, TN

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What is something unique about your product or service?

Northrop Grumman Remotec collaborated with Kinova Robotics and the Department of Homeland Security to integrate the Kinova Remote Manipulation System with Andros Unmanned Ground Vehicles (UGV). The Remote Manipulation System is used as an accessory and functions as a second, independently controlled robotic arm for missions requiring the capability to perform highly dexterous and precise manipulation. This manipulator mounted to a mobile robot platform gives the operator the flexibility of using the Andros arm to move or hold large, heavy objects and the secondary manipulator can be used for surgical manipulation or interrogation of the object. Having both capabilities on one UGV is advantageous and beneficial and contributes to the overall success of a mission.

What do you consider your organization’s differentiator?

Remotec has over 37 years of experience designing, producing and fielding Unmanned Ground Vehicles (UGV). Andros UGV systems are repeatedly field tested and continue to prove to be rugged and reliable. Our customer support group provides 24/7 rapid response to decrease downtime and ensure that customer intimacy remains a key differentiator. Remotec has over 2800 systems fielded in 36 Countries.

What capability gaps are you able to fill and which industry colleagues would you like to know about them?

Dual manipulation generates new possibilities, fills capability gaps and increases the overall performance of our UGV’s. The addition of the Kinova arm introduces a higher potential for preserving evidence through more precise and deliberate manipulation. Defeating or examining suspect devices remote while keeping them mostly intact without the need for human intervention opens a new level of possibilities. Having the ability to maintain heavy lifting requirements as well as perform highly precise, surgical manipulation tasks on a remote, mobile UGV is a new capability within the Explosive Ordinance (EOD) industry, to include State and Local US Bomb Squads, DoD (all services), International and Power Plants.

Capabilities:

Cognitive & Collaborative Behaviors	Communications	Dual Manipulator	High Dexterity	Life Cycle Management
Mobility	Payloads Integration	Precise Manipulation	Robotic Manipulator	Semi Autonomous
System Design & Engineering Services				



EXTERNAL SYSTEMS

DEEP ANALYTICS, LLC | Montpelier, VT

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What is something unique about your product or service?

In a perfect world, organizations utilizing the latest machine learning technologies to classify threats in real time will have all the available computational resources, niche expertise, and robust training data necessary to achieve the most successful outcomes. Unfortunately, more often than not, reality does not mirror this idyllic scenario.

Enter: Deep Analytics, a contract research company that develops innovative and fieldable prototypes for the national security and defense communities. Working closely with our clients to thoroughly understand their needs and circumstances, Deep Analytics specializes in integrating cutting edge machine learning approaches deployed on severely constrained computing systems.

We make sensors smart.

What do you consider your organization's differentiator?

The promise of machine learning in new applications can be shiny and exciting when developed in a lab, but can also be tough to wrap your hands around and difficult to replicate in the field when placed under real-world conditions.

Deep Analytics strives to ensure performance and expectations are appropriately set and met. End users are an integral part of designing our solutions, and their feedback is incorporated at every step of our development process. We also provide support and training needed to empower our clients and equip them with the necessary skills to fully utilize their solutions.

The development of our flagship product, the Boom Camera - a high definition, pole-mounted camera system designed to closely inspect explosive threats, was a result of the successful collaboration between Deep Analytics and the EOD community. This integrated development approach has led to various iterations, and we are currently integrating the Boom camera system onto legacy ground robotics.

Our culture and commitment to quality sets us apart.

What are your teaming goals within NAMC?

As a non-traditional small business, Deep Analytics is looking to expand its teaming framework with larger businesses with a foothold in the industry.



Capabilities:

Electronics

Payloads Integration

Perception & Situational Awareness

Sensors

System Design & Engineering Services

Machine Learning

Rapid Prototyping

Retrofitting Legacy Ground Robotics

MOBILITY

IGUANA TECHNOLOGY, LLC. | Tillamook, OR

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What are your organizational goals?

Providing the best technology for the American Soldier. My first prototype, the tractor with tracks, was owned by John Deere. The dealer let me use it for a year. I had contact with Bob Wismer at an ISTVS conference in 93 he was director of engineering at JD. I was later invited to JD at Moline R&D center by Dr. John Reid, Ch. Eng. For robotic vehicles. I send an annual update to my POC Arron Hopkins but he does not respond. Hoyle Hodges with DRASH looked me up at my shop in Ilwaco WA, 2004. The year before he had been Sargent Major in Afghanistan. We spent several days together and we ended up making a presentation to the DRASH business development meeting in Orangeburg NY. I was voted in by 40 people (mostly soldiers) including Jon Prusmack, president and owner. Frank Finelli with Carlyle Group killed the deal. "no future in ground vehicles". Frank was on the DRASH board. In 2005, I was involved with the FCS Program at Boeing and qualified as a bidder on the MULE, SOLDIER, ARV and a supplier on the LIGHTWEIGHT TRACK PROGRAM FOR THE BRADLEY. The FCS Program was cancelled by Obama and Biden in 2009. My designs were based on the tractor with tracks technology and my patents. (Wikipedia) FCS cost the taxpayers 50 billion over 5 years. In 2007 the SDD phase was turned over to "key contractors" LM, NG, GDLS and Irobot. I borrowed from my daughter to attend conferences in Huntsville, Seattle and SanJose.

What are you most proud of?

The new concepts that I have discovered and tested. Some of my accomplishments are: 1. Low Impact Tracked Vehicles Patent. 2. Track Angle control, APPS 3. T-bar suspension, APPS 4. Cone shaped rubber fingers for ground contact, APPS 5. Track Assembly as a mechanical composite, APPS 6. Support provided by track tension, APPS 7. Staggered grouser pattern, 8. Configuration, APPS 9. Track retention solutions, 10. Speed solutions, 11. Gyro Force solutions, 12. Rock throwing solutions, 13. Icing solutions, 14. Water propulsion solutions, 15. Production and repair solutions, 16. Truck maintenance and service solutions and, 17. Reducing costs by integration with established production mechanisms.

What are your teaming goals within NAMC?

To work with knowledgeable people with similar interests and goals. I believe; "EXPERIENCE MATTERS". I also believe that good products and projects are the result of efforts from more than one person. During my 25 year career as a sales engineer I was often the catalyst in the discussions with my customer's managers and engineers. My best was a track roller bearing on the 737 flaps in 1972 that required lubrication every 50 hours. With information from a similar application (a fish cleaning machine in Alaska) and input from Boeing as well as my company (McGill) engineers I came up with a new design. The last report, from the test plane at United was 8 years without lubrication. My good friend Larry (RIP) was awarded associate fellow at Boeing and my design became a new standard for aircraft bearings. McGill had to turn down orders. The job I had does not exist anymore. McGill was bought by Reliance. Mechanics are most appreciative of my work. Heather Wilson, Sec AF, in her speech to the Airman convention two years ago; "We can no longer rely on revisions to thirty year old technology and stay ahead of our enemies and competitors." My vehicles can stay closer to the soldiers and reduce the amount of gear they now carry. Master Sargent Hoyle said; the only good thing about the JD M Gator. "beat's walking".

Capabilities:

- Energy
- Fuels & Lubricants
- Materials
- Mobility
- Open Architecture & Standards Development
- Payloads Integration



MODELING AND SIMULATION



NEW EAGLE CONSULTING, LLC. | Ann Arbor, MI

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What do you consider your organization's differentiator?

New Eagle is a mechatronic control system company who applies successful commercial technologies to military systems. The US Army needs to Modernize and Maintain its equipment and New Eagle has the systems experience, productive tools, and a safe supply chain to accomplish these actions.

Our tools including our embedded model-based development (eMBD) platform called Raptor™, allows engineers to model and simulate complex dynamic systems, and quickly build and test software that is correct and reliable. Raptor tools and methods are used by New Eagle and are available to its customers to Take Control of software and systems IP development.

The products within our supply chain come from reliable vendors and can be applied from prototype to production. The DoD requirement of a validated, Modular Open Systems Approach (MOSA) can be met using the Raptor-based electronic controls to solve modernization and end-of-life obsolescence problems.

What capability gaps are you able to fill and which industry colleagues would you like to know about them?

Our Mechatronics engineering team can fulfill engineering needs in the following disciplines: systems engineering, simulation & control systems, embedded software & hardware, vehicle networking, HMI displays, mechanical integration, & project management.

Our Applications include Autonomous Drive-By-Wire (DBW) Systems, Electrification, Engine Control, Vehicle Networking and Distributed Control.

What do you want other NAMC Members to know about you?

We are a WBENC certified and DCAA approved women-owned small business, with extensive experience as a prime and sub-contractor for DoD projects. We look forward to continuing our strong support of the US military.

Our customers come to New Eagle as a turn-key system provider to solve frustrating control system challenges quickly and reliably as well to have the option to Take Control of the software and system IP development.

Capabilities:

Autonomous Navigation & Controls	Communications	Control System Design	Control System Integration	Electronics
Electric & Hybrid	Embedded Controls	Embedded Model-Based Development (eMBD)	Energy	Engine Control
Human Machine Teaming	Intelligent Machines	Modeling & Simulation	Safety & Testing	Validation & Verification



POWERTRAIN

JENOPTIK ADVANCED SYSTEMS, LLC. | Rochester Hills, MI

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What is something unique about your product or service?

Jenoptik Advanced Systems, LLC has a long history of providing 28 VDC generators for multiple combat platforms around the world. Our focus areas are 28 VDC alternators and generators in the 600 A to 1000 A output current range and high voltage energy systems with up to 500 kW.

Jenoptik was the first company to field a 1000 A / 28 VDC alternator in a military land vehicle and is still the only company having a 600 VDC energy system with Integrated Starter Generator (ISG) in serial production (in the Puma IFV).

What do you consider your organization's differentiator?

Jenoptik Advanced Systems, LLC is an established partner for development and manufacturing of electrical systems for military vehicles. Our generators are fielded in the MBTs Leopard 2, Merkava IV, Leclerc, and K2, the IFVs Puma, Boxer, and Warrior, and the Howitzer PzH2000. Our electric gun turret drives are used in the Leopard 2, Puma IFV, and the howitzer PzH2000.

Jenoptik offers off-the-shelf products. However, our particular strengths are customer-specific developments and adaptations to vehicle requirements both in the area of power generation and weapon stabilization.

What are your teaming goals within NAMC?

Jenoptik's goal within NAMC is to team up with companies that are involved in the drive train or electrical power generation. Our expertise in the area of generators and ISG technology can have a significant impact on the overall power pack design and make a real difference regarding Size, Weight, and Power (SWaP).

Jenoptik also wants to work with OEMs and turret manufacturers who are looking for partners in the field of weapon stabilization and electric gun turret drives. Jenoptik's new modular and scalable EGTD system supports upgrade programs of existing vehicles and as well as new developments and provides significant advantages over systems currently on the market.

Capabilities:

Alternator	Autonomous Navigation & Controls	Electrical Power	Energy	Generator	High Voltage Energy Systems
System Design & Engineering Services	Vehicle & Platform System Integration	28 VDC	600 VDC		



SURVIVABILITY



METTLE OPS | Sterling Heights, MI

POC: Katie Bigelow | kbigelow@mettleops.com | www.mettleops.com | [in](#) [f](#) [t](#) [i](#)

What is something unique about your product or service?

Timelines, supply chain risk mitigation, and fiscal responsibility are the top three items we consider when submitting a proposal for an RFI or RFP. Mettle Ops carefully analyzes the requested deliverables to ensure we are providing the best product or service to the Government. With our extensive network, we are able to reach out to prospective sub-contractors and request information or solutions to supply the deliverables or increase their capabilities. We have past prime performance of \$34 million contracts and have demonstrated our ability to be flexible and remain committed to deliverable dates.

What do you consider your organization's differentiator?

With the vision of Warfighters Serving Warfighters, Mettle Ops is able to provide superior support in program management, engineering, finance, IT, cyber security, 3D printing, and business development. With over 30 years of combined military service, Mettle Ops is acutely aware of the obstacles facing the Warfighter and therefore are able to provide products and services with industry ingenuity and practicality.

We are fiscally conservative, and we champion our expertise to bring exceptional results. Mettle Ops is certified Service Disabled Veteran Owned Small Business (SDVOSB), Economically Disadvantaged Woman Owned Small Business (EDWOSB), Women Business Enterprise (WBE), Woman Owned Small Business (WOSB), National Veteran Business Development Council (NVBDC), Center for Veterans Enterprise (CVE), Veteran Owned Small Business (VOSB), and U.S. Small Business Administration 8(a) Certified. We are NIST 800-171 compliant and ISO 9001:2015 Certified by PJR.

What do you want other NAMC Members to know about you?

Mettle Ops guarantees predictability in pricing, dependability with stated deliverables, and transparency in risk management. We are Warfighters serving Warfighters and our mission is to help save soldier lives on the battlefield. Our values are grit, tenacity, and transparency, and we live those out every day.

Capabilities:

Administrative Support	Cyber Security	Modeling & Simulation	Open Architecture & Standards Development	
Program Management	Safety & Testing	Survivability	System Design & Engineering Services	Validation & Verification
Vehicle & Platform System Integration	3D Printing			



TESTING AND EVALUATION

NEVADA AUTOMOTIVE TEST CENTER (NATC) | Carson City, NV

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What are your organizational goals?

NATC is a privately owned, independent test and engineering facility that has been supporting military and commercial customers since 1957. We are a HUB-zone small business that pioneers value-added technical solutions for our worldwide transportation partners. NATC provides a broad spectrum of testing, including automotive performance and durability, weapons systems, environmental, blast, and transportability. At our main proving ground in Nevada, we have test facilities and courses, and support facilities, including a fabrication shop, workshops, and an instrumentation shop. Additionally, we provide virtual design and test of components and vehicle systems, including CAD, FEA, and multi-body dynamics simulation. We have provided services for more than 1,000 vehicle systems and components for automotive, commercial, construction, military, and public utility applications, and we have logged more than 50 million test miles and advanced the state of the art in test procedures, data acquisition, and analysis.

What capability gaps are you able to fill and which industry colleagues would you like to know about them?

NATC's proving ground is situated in the Great Basin, offering access to a wide variety of the terrain types found around the world, and enabling us to accurately replicate mobility features and challenges found in various real-world environments. We excel at maintaining representative, repeatable test courses, which is key to our success in vehicle testing and duty cycle correlation. NATC conducts independent, standardized tests for commercial and military vehicles (including survivability and lethality solutions) referencing relevant protocols such as TOP, ITOP, AEP, ASTM, STANAG, and SAE standards. We have water testing capabilities from fording to 60-inch depth to simulated ship launch and recovery. NATC develops User evaluations with thorough curricula that prepare users for driving the vehicles and for understanding the vehicle—terrain interface and its application to performance specifications. We are well versed at evaluating and testing hybrid vehicle performance. Our winter facility offers optimal winter test conditions from December through March, with 2 million square feet of groomed test surfaces, expanded facilities and infrastructure. We conduct fuel economy and human factors evaluations, and assess situational awareness and electronics systems. NATC is also a leader in developmental and production tire testing.

What do you want other NAMC Members to know about you?

NATC offers a variety of custom solutions. NATC has developed a quantifiable Vehicle-Trail Rating Classification System (V-TRCS) methodology, based on over 50 years of off-road mobility experience, to define terrain severity and conditions that demand greater capability for vehicles ranging from off-road recreational vehicles to the largest logistics vehicles. We have developed and maintain a duty cycle database of terrain, road roughness, and climatic conditions that range from North American to international markets. NATC develops tailored driver training courses spanning basic to advanced driver training and trail experiences, and specific training. NATC engineers consult with our automotive customers from around the world on a comprehensive range of programs and issues related to vehicle design and development, procedures and standards, and specialized tests. NATC's state-of-the-art fabrication facility allows for all aspects of fabrication and production concept integration, from clean sheets of paper builds to frame off, body off, and new design/research prototype integrations.

Capabilities:

Communications	Life Cycle Management	Mobility	Open Architecture & Standards Development	Payload Integration
Survivability	System Design & Engineering	Testing & Evaluation	Vehicle/Platform System Integration	