



==== NATIONAL CENTER FOR ====
AUTONOMOUS TECHNOLOGIES



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NATIONAL CENTER FOR
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NCAT

- Jonathan Beck
 - Principal Investigator and Director of the National Center for Autonomous Technologies.
 - Air Traffic Control, UAS Pilot and Sensor Operator, Private Pilot
 - Fielded first of their kind small, medium and large scale UAS programs across state and federal organizations
 - Department of Defense State and Federal, MinnState, Department of Transportation, Department of Agriculture, Department of Natural Resources, Soil and Water, State Fire Initiatives
 - PI of 4 NSF ATE Grants Collaborative UAS initiatives throughout higher education including the MinnState System and the ATE network.

NCAT Partners:



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National Center for Autonomous Technologies (NCAT)

Mission of the NCAT:

Lead the education of the nation's Autonomous Technologies workforce through a concerted effort which will focus on expanding educational resources to address current workforce demands, develop career pathways, and broadly engage stakeholders from industry, government, and related ATE Centers and projects.

Vision:

Strategically navigate the future of Autonomous Technologies through visionary thought leadership and collaboration among stakeholders.

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National Center for Autonomous Technologies (NCAT)

Lead // Professional Development workshops for educators and industry professionals

Inspire // Promote and provide support to encourage engagement in STEM and autonomous technologies in secondary and post-secondary education

Connect // Engage workforce and community stakeholders generating added value in programs and the workplace through opportunities using autonomous technologies

Serve // Provide the educational resources for curriculum, interactive content, applications and exchange of ideas for autonomous technologies across the country

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Air



Zack Nicklin
UAS Program Manager NCTC
UAS Director/Co-PI NCAT

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NCTC Overview

First UAS maintenance program in the nation
First Geospatial Intelligence AAS Degree Program in the nation
NSF ATE **DRONETECH** Initiatives

UNMANNED AIRCRAFT SYSTEMS



NCATT, SpaceTEC and ASTM Standardization of UAS Maintenance Certification

DACUM with SpaceTEC and GeoTech

Educator Workshops and STEM Camps

Collaborative MinnState initiatives and with public/private sector industry

St Cloud State University 2+2 and Course Development

Ridgewater College – GPS/GIS Precision Agriculture Program

Lake Superior- State Fire Marshals Fire Technology

Central Lakes- Agriculture Research and Community outreach

Public/Private industry partnerships and service learning models

Production Agriculture, Forestry, Conservation, Inspection, Fire



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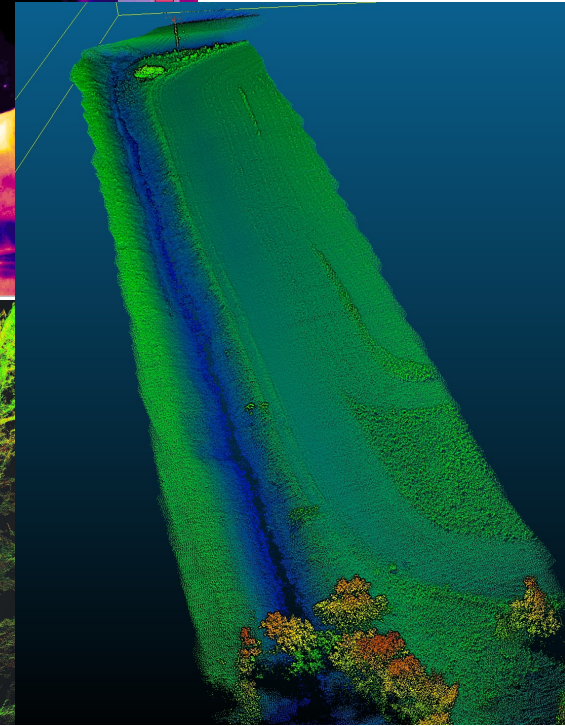
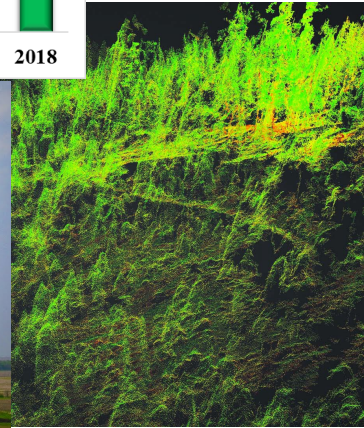
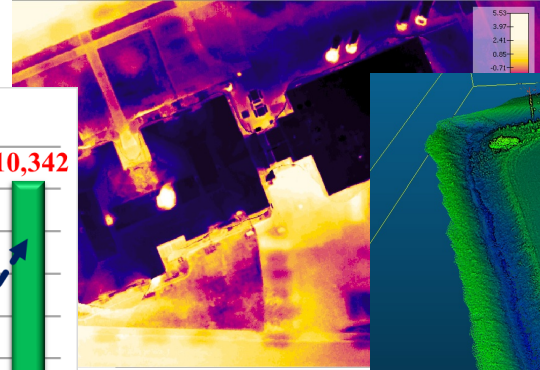
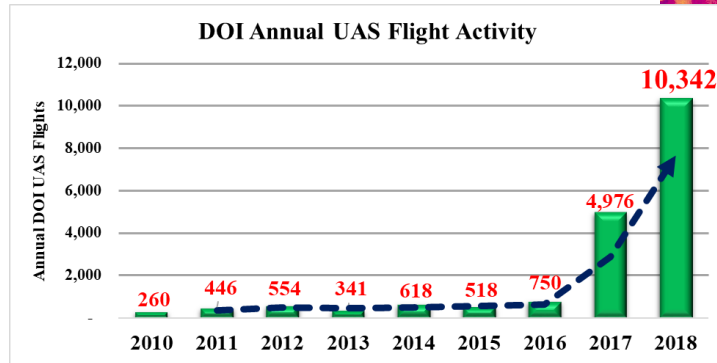


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Ben Cruz
Director

Center for Advanced Automotive Technology (CAAT)
Macomb Community College

Road to Self Driving Vehicles

CAAT Background; the National Science Foundation awarded a grant to fund the Center for Advanced Automotive Technology at Macomb Community College in 2010. This was in response to emerging technologies in the Automotive Industry and the developing skills Gap.

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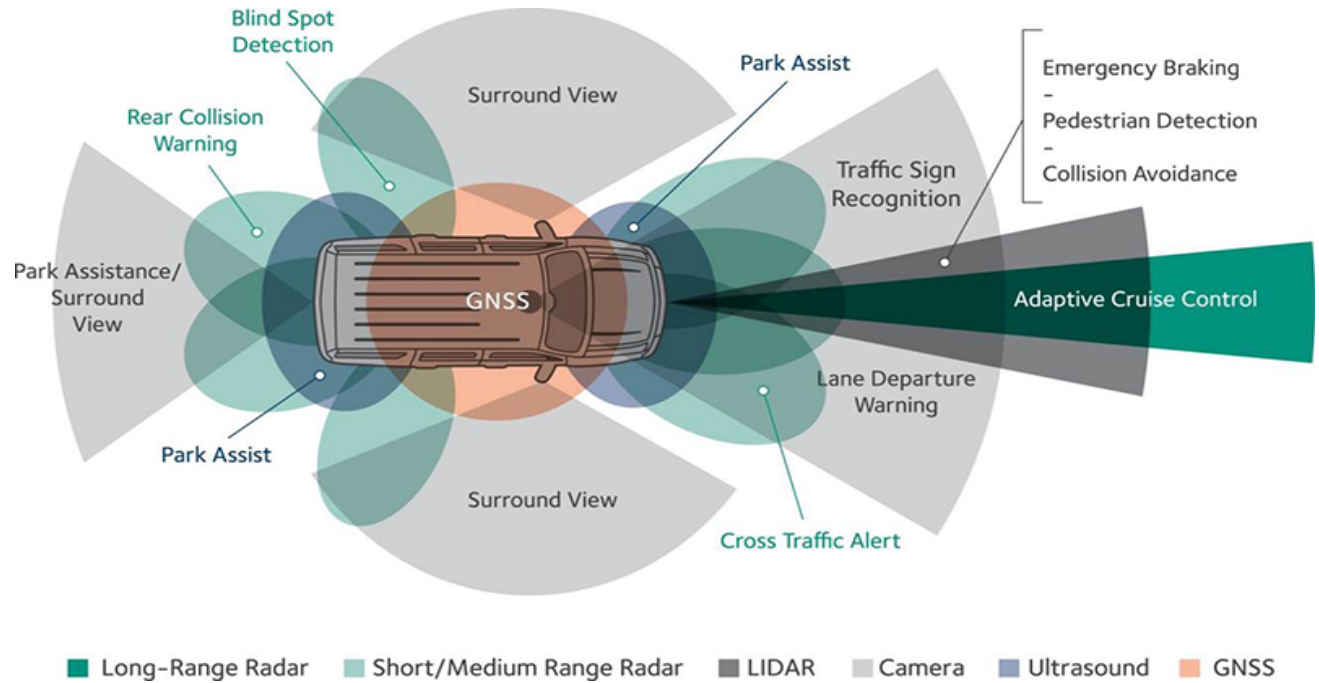


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EV Vehicles and Driver Assist Vehicle Systems



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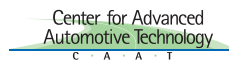
The Self-Driving Car Timeline – Predictions, (from analyst Jon Walker’s Article May 14, 2019).

- GM – Rumors of some Self-Driving by 2020 (Cruise Automation & Lyft).
- Ford – Level 4 Self-Driving by 2021 (Argo)
- Honda – Self-Driving on the Highway by 2020 (Waymo)
- Toyota – Self-Driving on the Highway by 2020
- Renault-Nissan – 2020 Autonomous Cars in Urban Conditions, 2025 Driverless Cars.
- Volvo – Self-Driving on the Highway by 2021 (Uber)
- Hyundai – Highway 2020, Urban Driving 2030
- Daimler – Nearly Fully Autonomous by Early 2020’s (Uber and Bosch)
- Fiat-Chrysler – CEO expects there to be some self driving by 2021 (Waymo)
- BMW – Fully self-driving Level 4 or 5 possible by 2021 (intel and Mobileye)

Summary

The industry expects that we will see a significant number of cars with some self-driving capacity on the road by the 2020’s, with the first vehicles mostly being luxury cars or part of commercial fleets. This capacity may or may not be implemented depending on regulatory and infrastructure concerns

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What can the Center for Advanced Automotive Technology (CAAT) do

- Website offering advanced automotive technology information including free curriculum resources
- Professional development for educators and industry
- Develop new courses and programs in emerging automotive technology; Electric Vehicle, Autonomous Systems, and Cybersecurity
- Outreach partners to recruit qualified students
- Prepare students for careers in new and developing advanced automotive technologies beginning by:
 - Stimulating the student's interest in STEM (Science, Technology, Engineering and Mathematics) careers through STEM, AUTOSTEAM and Career Exploration events.

 - Credentials acquired through seamless educational pathways from Macomb to Wayne State University

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What can the Center for Advanced Automotive Technology (CAAT) do

Macomb Community College

- A two-year Vehicle Development Technician Associate of Applied Science Degree
- A one-year Electric Vehicle Development Technology Certificate
- Two-year Associate of Applied Science automotive related degrees and shorter duration certificates

Articulation Agreements with Wayne State University

- For a Bachelor of Science Degree in Electrical or Mechanical Engineering Technology at Wayne State University
- A graduate certificate in Electric-drive Vehicle Engineering
- A Master of Science Degree in Electric-drive Vehicle Engineering

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LAND

- Chris Hadfield
 - Director of the Minnesota State Transportation Center of Excellence



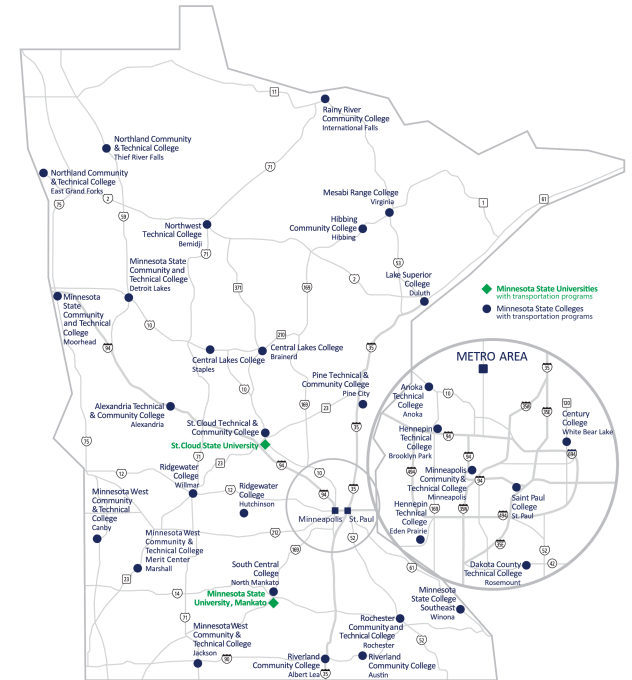
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MN State Transportation Center of Excellence

- A collaboration of industry, post-secondary education, and secondary education.
 - MISSION: The Minnesota State Transportation Center of Excellence drives workforce innovation through education and industry collaboration – and **provides thought leadership on workforce development** in the transportation industry.
 - VISION: Enhance education, engage industry, inspire students



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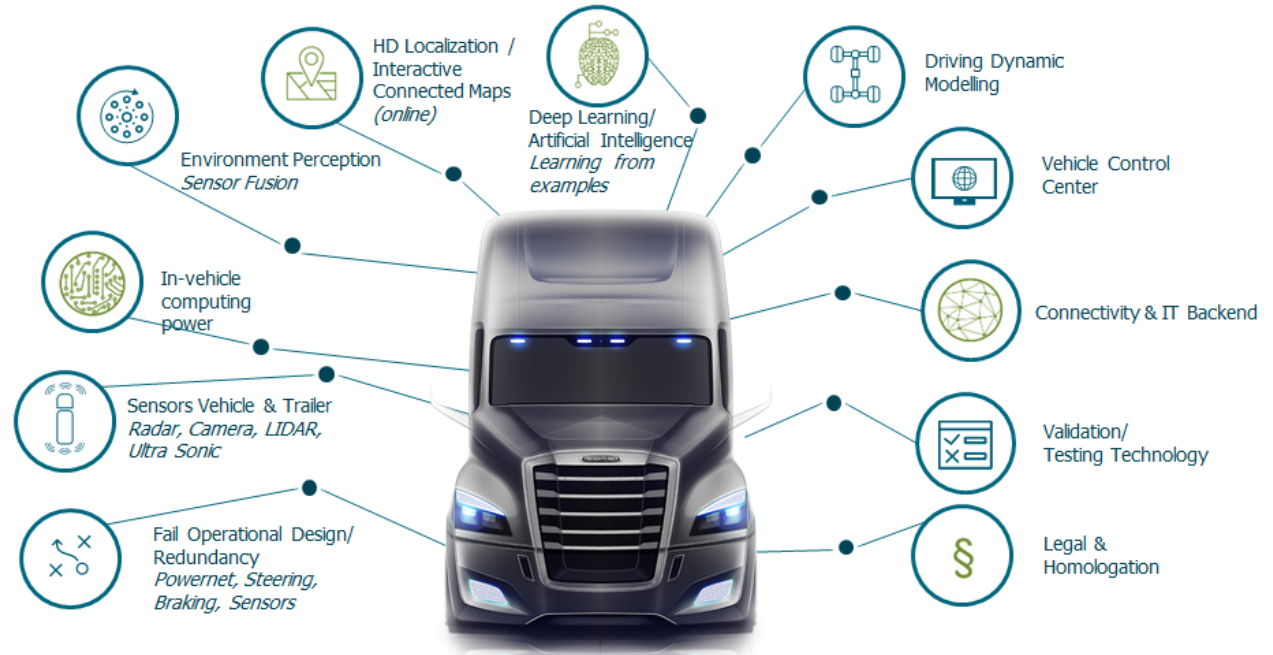


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Land – CAV Technology



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Land – CAV Outreach

- Partnerships
 - With industry, educators, government, associations, chambers, Etc.
- Leadership
 - Leading by doing
 - Creating connections that sustain and go beyond



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Land – CAV Outreach

- Bleeding Edge Technology
 - Integrated student experiences with industry partners
- Enhancing Education
 - Bringing technology where it may not always get to
 - Starting that
- Engaging Industry
 - Creating partnerships that are local/sustainable, but also help employers
- Inspiring Students
 - Using technology to create experiences that are significant and meaningful

NCAT Partners:

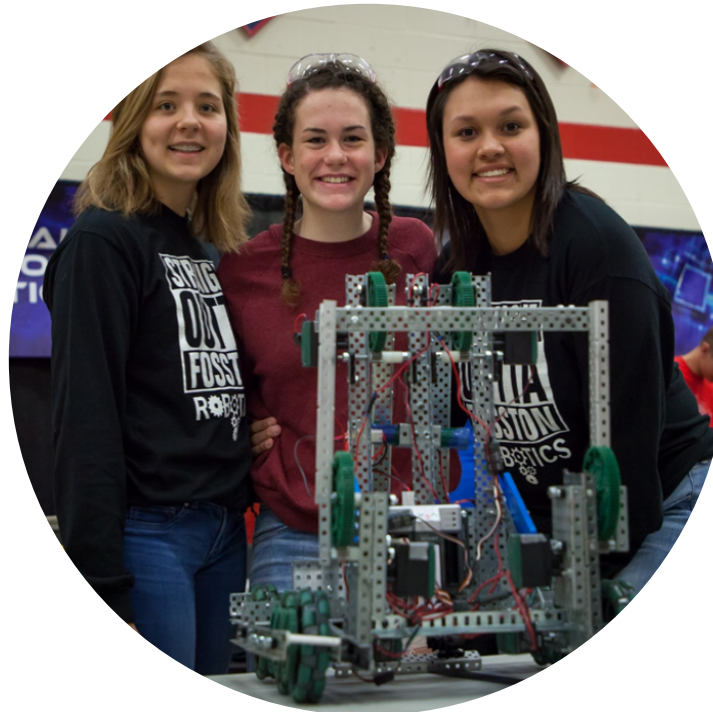


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LAND :VEX Robotics



Andrew Dahlen
Electronics / Manufacturing instructor
VEX Robotics Coordinator
Northland Community and Technical College

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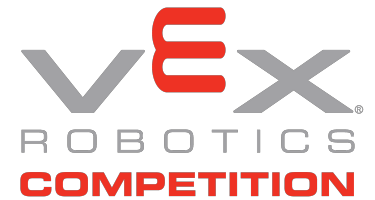
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Robotics Education and Competition (REC) Foundation
24,000 teams across 60 Countries.



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Building the Pipeline VEX robotics

GOAL: inspire youth to seek stem careers

Northland Community and Technical College

St. Cloud Technical and Community College

Leading VEX Robotics Outreach in Minnesota and
North Dakota.

Competitions

Robotics Camps

Teacher Workshops

400+ Teams



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Passion led
us here

- Coaches / Mentors
- School Administrators
- Parents
- Industry Partners
- Minnesota State College Partners
- Volunteers
- Program Alumni
- Student success
- Support structure

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SEA

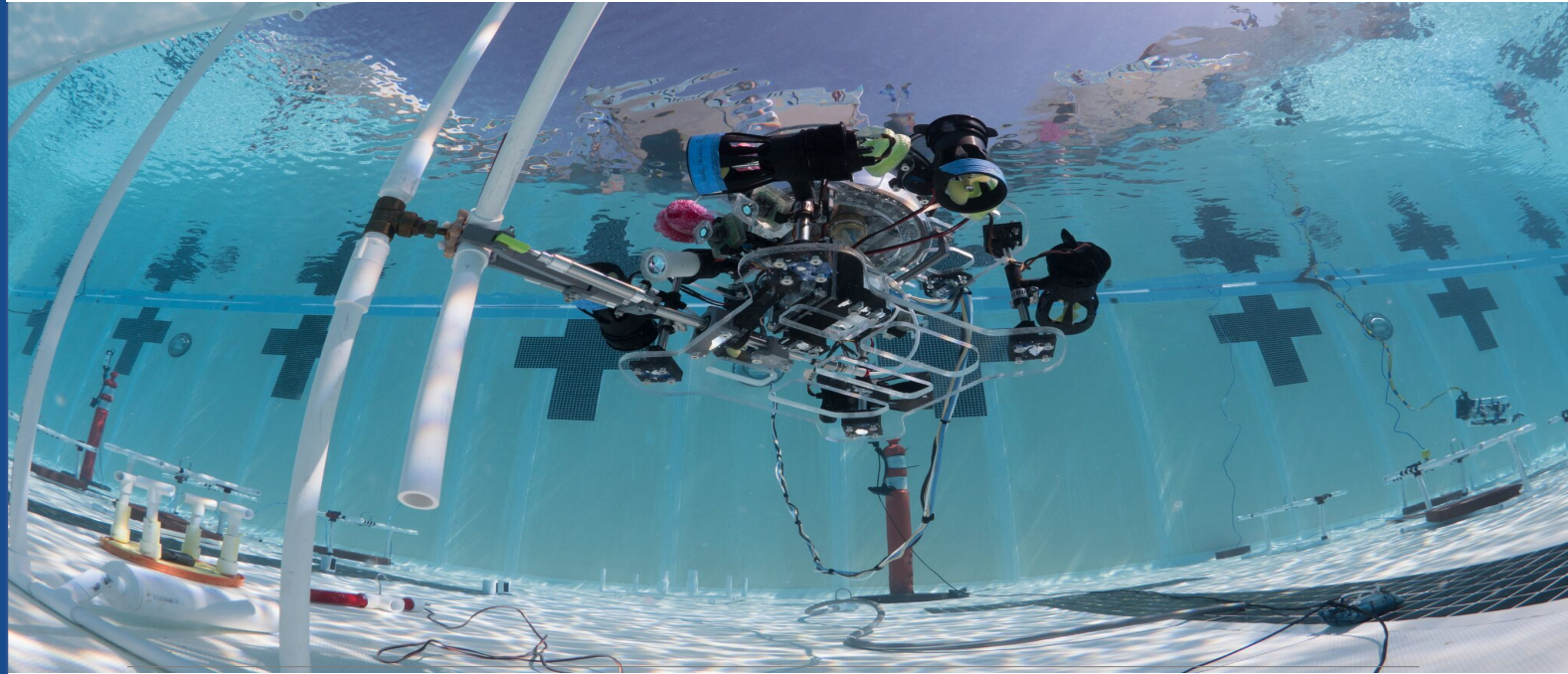
Jill Zande

President/Executive Director, MATE Inspiration for Innovation

Co-PI and Associate Director, MATE Center



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UNMANNED UNDERWATER VEHICLES

Since 2016, numerous startup companies that build unmanned underwater vehicles (UUVs) or unmanned surface vehicles (USVs) have raised significant capital or been acquired by larger companies. All told this represents nearly \$1 Billion in economic activity in this sector in the past 3 years.

New ventures continue to launch in this space and the demand for talented technologists with domain experience will grow significantly over the next decade.

- *Justin Manley, Founder and CEO, Just Innovation*



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MATE ROV COMPETITION (#watergame)

- Entrepreneurial, business-oriented approach to solving problems
- One WORLD championship and a network of 40+ regional events
- Progression of competition levels or “classes” that scale based on the complexity of the tasks and ROVs
- “Alumni” serve as judges and provide insight into the latest workplace technologies and trends



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Questions and Open Discussion



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Strategically Navigate the Future of Autonomous Technologies

www.NCATech.org

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