

ihmc



FLORIDA INSTITUTE FOR HUMAN & MACHINE COGNITION

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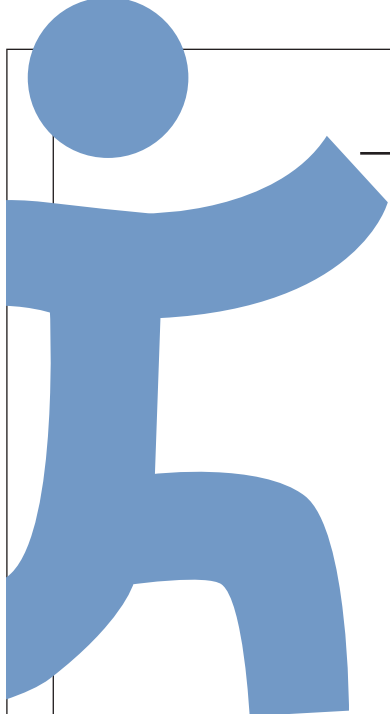
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Dear Friends,

Since 1990, the Florida Institute for Human and Machine Cognition (IHMC) has pursued a unique trajectory putting innovation in motion. Our researchers are focused on rethinking the relationship between humans and machines and defining new directions in maximizing the potential of that relationship.

It is why IHMC has evolved into a habitat for innovation, bringing to Pensacola and Ocala some of the most brilliant minds in the world in artificial intelligence, cognitive psychology, computer science, robotics, and human healthspan, performance, and resilience, working for the benefit of this generation and the next.

It's not an accident that AI is listed first in the above paragraph. AI and human-machine teaming was our first focus area, and it is a field that has exploded since our founding. In this edition of the newsletter, we wanted to highlight some of the work of our team is doing in this space. Dr. Niranjan Suri and Dr. Matt Johnson are just two of IHMC's thought leaders with international reputations in human-machine teaming.

In this newsletter, we also highlight some of our human performance research. Dr. Jeff Phillips' team is designing haptic gloves that will improve function for military aviators in harsh conditions. Additionally, this newsletter reports on a project led by Dr. Anil Raj's team which is focused on building a virtual testbed to prototype interfaces more quickly.

As always, some highlights of summer – Robotics Camp in both Pensacola and Ocala and the annual influx of student interns – enliven our campus and, we hope, open some young inquiring minds to the possibilities that science, technology, engineering, and math hold for the future. You'll see a recap of camp and a spotlight on some of our interns, reflecting our commitment to reinforcing the pipeline of intellectual talent in our communities and across the nation.

We are always looking toward the future. It's baked into our DNA. This summer we began a series of community conversations we're calling "Better Together." These small-group sessions allow us to share our impressive history in the context of plans for our future, manifested by the progress of the new research complex on our Pensacola campus. We are on track to open this facility in June 2024.

There is more to come, and I look forward to sharing it with you.

Best,



Ken Ford



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Harnessing the Internet of Things to help servicemembers is key part of IHMC research

You used the Internet of Things (IoT) already today even if you didn't realize it.

The GPS mapping tools that guided your commute, the traffic cameras that alerted you to a traffic delay or nabbed a red-light-runner, the smart-home devices that locked your front door, turned off the lights, and told you the weather — all are part of the IoT.

It's likely that any errand you ran this week used these networked sensors to communicate and share data as part of a wide array of everyday things that exchange information, sense the environment, and act on it.

The data gathered and analyzed by IoT has a range of applications for both military and civilian life, and IHMC's Associate Director Dr. Niranjan Suri is among the leaders researching how this data trove could be leveraged.



Dr. Niranjan Suri

Throughout his career, Suri's research has focused on networking, communications, distributed systems, information management, interoperability, Internet of Things (IoT), and the application of machine learning to all of those domains.

"They can essentially create a smarter thing, a smarter home, a smarter military

— even a smarter city," Suri said.

For several years, Suri and his team have investigated the ways the military community could utilize this publicly available, free data from the civilian IoT. Suri and his team also have considered how the military version of the IoT— the Internet of Military Things (IoMT) — could be maximized to improve logistics and protect our nation's warfighters.

Public data treasure chest

Civilian IoT is a rich source of data with wide applications, some currently in use, some still in the idea phase:

- Cities increasingly are offering services that can tell you things like where you can park your car, when the next public bus, train, or subway is coming, or if there are delays and suggest alternate routes.
- Cities are using IoT sensors to create a real-time picture of the environment by tracking air quality, temperature, noise pollution, and ultraviolet radiation.
- Electrical grids can use IoT to monitor power consumption, balance uploads, and anticipate where there might be problems upcoming.
- Connected cars could use IoT so that the car in front of you talks to the car behind you about roadway conditions, so maybe your car can avoid the bump or hazard that the car in front of you went over.

"Sometimes it is behind the scenes. Sometimes you actually interact with it," Suri said.

Networked sensors are part of a wide array of everyday things that exchange information, sense the environment, and act upon the environment. The data gathered and analyzed by the IOT has a

range of applications for both military and civilian life.

"They can essentially create a smarter thing, a smarter home, a smarter military, even a smarter city," Suri said.

For several years, Suri and his team have investigated the ways that the military community could tap into this trove of civilian data, much of which is free, and publicly available. Suri and his team also have considered how the military version of the IOT — the Internet of Military Things (IoMT) — could be maximized to improve logistics and protect the safety of our nation's warfighters.

Military applications of IOT

Suri also has worked for several years on projects with IOT for military applications.

Beginning in 2014, Suri co-chaired a North Atlantic Treaty Organization (NATO) coalition of subject matter experts and thought leaders looking at all the military domains — logistics, automatic monitoring of equipment, health and wellness of soldiers, information gathering and sensing of the environment of cities — with an eye toward how to make civilian IoT data available to warfighters conducting humanitarian or military missions.

One exercise leveraged a real-world smart city's IoT infrastructure to model a scenario in which the military has been called in to aid in disaster recovery.

Another exercise tackled finding the quickest route from an embassy to a train station with an injured person using IoT infused with edge computing to process video feeds to distinguish between military and civilian vehicles, people, and other hazards along the route.

"All of this information can come very quickly and helps you improve your

situation awareness,” Suri said. “One of the major thrusts of our goal is to improve the situation awareness of these military operators.”

The Internet of Battlefield Things

IHMC also supports a program with the U.S. Army that for the last six years has funded basic research into understanding how the Internet of Battlefield Things (IoBT) can be maximized to manage resources and keep servicemembers out of harm’s way.

One COVID-19-era innovation from this program — the Distributed Virtual Proving Ground — is having impact well beyond its origins as a workaround to travel restrictions in the pandemic era.

What was once limited to an annual in-person gathering of experts to test new ideas is now, with IHMC as a hub, a virtual testing network that supports distributed experimentation year-round, Suri said.

“Now we experiment year-round, just continuously doing this kind of testing and evaluation,” he said. “It has improved outcomes in every way imaginable.”

Daniel Duran is a Senior Research Associate who began his IHMC career as an intern in 2011. His past work has included developing computer vision algorithms to autonomously detect from high altitudes downed human pilots in

the Australian Outback. He also designed and built a GPS-guided system used to deliver an emergency response payload to the pilots autonomously.



Daniel Duran demonstrating sensors

About a year and a half ago, he and the IHMC team began work on a threat detection system that could provide a lower-cost initial line of defense for critical infrastructure as well as for military personnel.

These networked sensors have five to 10 different sensing modalities, including tracking light, temperature, motion, even the ability to track chemical, biological, radiological, nuclear, and explosive (CBRNE) exposures.

“You can imagine how you might place these around critical infrastructure like a military base or power plants or an airport, so that you can very quickly assess a situation,” Duran said.

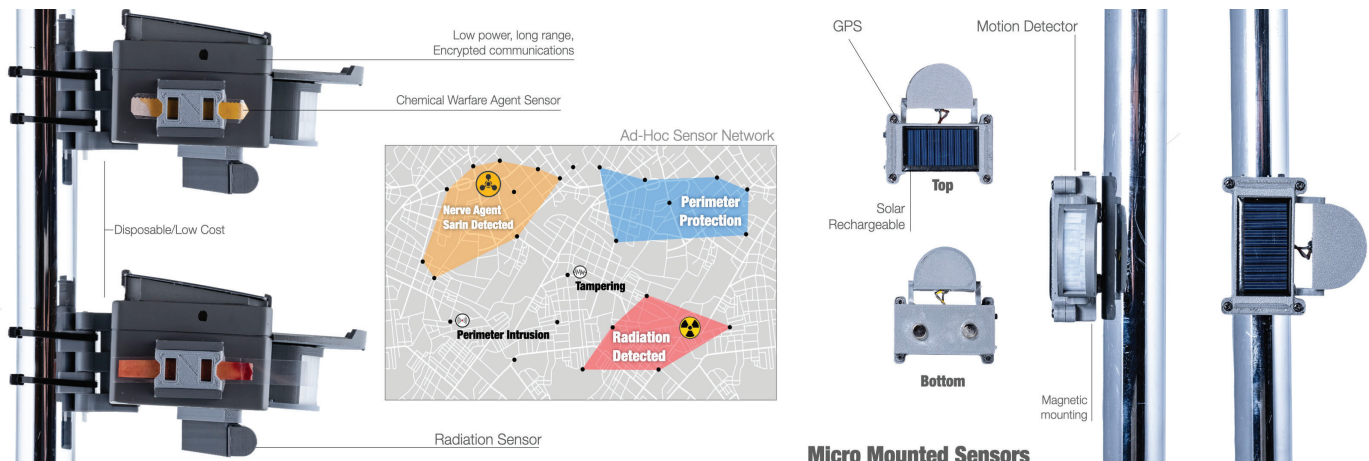
This entirely autonomous system feeds data to the command center and to a warfighter in the field.

“So you can have a first-responder like a police officer, firefighter, or a warfighter simply attaching this to (their person) and they’re good to go,” Duran said. “And you also have the ability to monitor their health and the threats around them very carefully from different distances.”

The wearable version of the device has additional applications in the field that are still being explored, Duran said. It is an innovation that could save time, money, and potentially lives.

Existing sensor technology in use is complicated and expensive — anywhere from \$10,000 to \$100,000 per sensor. These devices can sense anywhere from five to 10 different modalities in a single sensor for less than \$100 each.

“The whole point of this technology is to complement already existing technologies,” Duran said. “We want not just to develop the framework itself, but also to miniaturize and develop the sensor technology to make it cheaper and more effective for usage on the field.”



Sensors such as these shown can be deployed at a fraction of the cost of existing sensor technology, monitor the environment for threats, and potentially save money and lives.

AI work at IHMC stresses the importance of humans in the loop

Artificial Intelligence is all around us. It's in your phone, your router, your home, and your car.

At the Florida Institute for Human and Machine Cognition (IHMC), researchers have been leading the way in maximizing this powerful force for nearly 30 years.

While the conversation in the public imagination is highly focused on the perils and pitfalls of "artificial intelligence," IHMC and its founder, Dr. Ken Ford, have been shifting the conversation about AI to focus on how teaming human intellect and ability with computer science and machine learning can create something more.

"What we're interested in is less about a standalone intellect and more about amplifying human intelligence," said Ford, who has been a leading mind in the field for more than 30 years.

Indeed, AI was IHMC's focus area from its beginnings in 1990. Back then, researchers were interested in how these tools — thought of as cognitive orthotics — could be tailored to an individual.

Now the focus has expanded.

"We're interested in the machine being intelligent in a way that's interdependent with us so that we and it together are a team," Ford said.

Senior Research Scientist Dr. Matt Johnson a leader in the human-machine teaming, working on technologies that can be applied in domains including disaster response, space applications, aviation, and military operations.

Johnson's research into making human-machine teams more flexible, resilient, and effective also falls under this umbrella. Johnson's projects include using virtually reality, simulations and other tools to build training platforms to improve collaboration between humans and their machine partners.

"AI comes in a lot of flavors," Johnson says. "It's very broad, and IHMC's been involved from the beginning with the different approaches."

Teaming intelligence is one type of AI that Johnson has explored in multiple projects, which, over the years, have included robotics, software agents, and autonomous vehicles.

Johnson said an IHMC-developed



Dr. Matt Johnson

model, the Joint Activity Graph, allows for traditional reasoning approaches that don't require any machine learning, yet are human-designed, "which some would see as a flaw, and I see as an advantage. Unlike a lot of machine learning approaches, we can provide a guarantee."

The Joint Activity Graph gives the machines an awareness of team context so that they can make their decisions not just based on their own local information but also across the team. It has the advantage of functioning at a high level without centralized control.

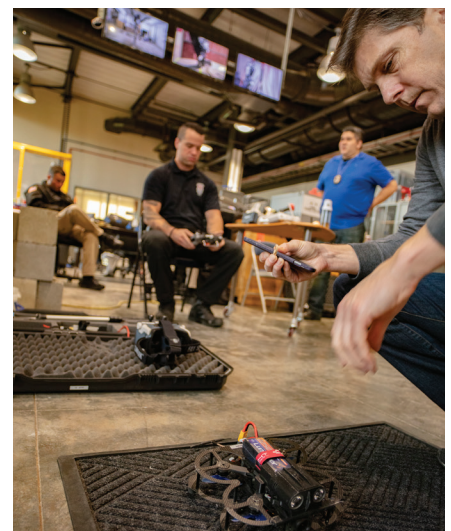
"Most systems today depend on centralized control," Johnson said. "You have a bunch of people who are controlling one or more remote systems and everything goes through them."

Johnson's team has shown that it is possible to achieve something close to centralized control performance with decentralized machines. Therefore when an inevitable reduction in communication effects a centralized control system, the Joint Activity Graph model still will perform at a high level.

"Something is going to disrupt your communications. They know that's going to happen," Johnson said. "You have to be ready for it. Our approach deals with that extremely well."

This was illustrated in a DARPA project Johnson led in which the IHMC team developed software agent embodied in drones to successfully play a capture-the-flag style game.

Johnson's team utilized modern machine learning techniques for some aspects of the work. Johnson started that "while this was successful in that we were able to show that it could learn some teaming though machine learning, I would argue it was not as successful as our Joint Activity Graph model, which is consistent, reliable and predictable.



Dr. Matt Johnson's team at work

Data-driven machine learning is not the answer for everything, and often other artificial intelligence techniques can be more practical and effective.”

“Our approach was to figure out the theoretical underpinnings of teaming and design intelligent solutions to solve that,” Johnson said.

Though that project concluded in 2019, Johnson’s team continues to use the findings in ongoing research.

“Good research doesn’t die, but it does pivot and adapt,” he said.

Finding ways to make these collaborations more effective and efficient are keys to improving performance for teams working together in high-risk arenas, from military operations to law enforcement scenarios.

Ford notes that such work reflects IHMC’s core tenet of keeping the human



element at the center of the human-machine team.

“Teamwork is about managing interdependencies. Observability, predictability, and directability are the necessary minimum conditions for a team,” Ford said. “You have to be able to observe what your teammates are doing, predict what they’re going to do next, and direct each other. This goes from human to machine and machine to human. The key is interdependence.

To Ford, AI is just an extension of what humans have always done with tools — use technology to improve our understanding of the world.

“Writing, for example, greatly expanded the scope of human cognition. With AI, we have a much more powerful tool to expand the scope of our cognitive abilities,” he said.



IHMC research such as that done by Dr. Matt Johnson’s team has focused on making human-machine teams more flexible, resilient, and effective.

IHMC-designed haptic gloves could improve pilot safety in extreme environments

A project for the U.S. Air Force has put Senior Research Scientist Dr. Jeff Phillips and his team at Florida Institute for Human and Machine Cognition (IHMC) looking for ways to make it easier for pilots to acclimate to cold environments.



Dr. Jeff Phillips

Funded in the fall of 2022 by U.S. Air Force School of Aviation Medicine, the project saw Phillips' team create haptic gloves with a tactile selector embedded to improve dexterity and performance of in-flight tasks.

In March of 2023, the design of the tactile selector was patented. Phillips is awaiting a second award from U.S. Special Operations Command for further development of the tactile glove. The applications of the project could be wide-ranging, Phillips notes.

"This fundamentally changes the glove in the cockpit and across all human workspaces," Phillips says.

The selector improves haptic feedback and precise digital manipulation of touch screens and other controls while wearing gloves. It allows the wearer selection

and interaction with small controls with pinpoint accuracy needed in the cockpit.

It also allows the wearer to type a message and control a touchscreen with ease while enjoying the protection of an insulated glove.

While the concept of haptic gloves is not new, the innovation that Phillips and his team have made in the IHMC-designed selector could serve as a game-changing way to help military personnel perform their jobs safely.

The objective was to develop enhanced gloves that will protect aviation personnel in extreme cold weather environments with an insulated glove with enhanced tactility and touch screen capabilities.

Phillips notes that 90 percent of cold-weather hand injuries are associated with removal of a glove.

"Gloves are necessary, but you can't do the job with them on," he says.


Military personnel have been giving feedback for at least the last six years, he said, that they need a better cold weather flight glove.

The selector allows operators to interact with flight controls and touchscreen devices in the cockpit and provide aircrew with ample protection that does not necessarily have to be removed to support common flight operations.

It would be most applicable for crews flying out of bases in Alaska or points north, where extremely cold temperatures present specific challenges. However, Phillips says the possibilities of the technology could be profound.

IHMC Research Associates Savannah Richardson and Landon Casey were integral to the project, Phillips says.

"Savannah and Landon were able to help design a novel practical interface to restore haptic sensitivity where people need thick protection but need to maintain manual dexterity and performance," Phillips says.

"It's been asked for by those who serve and that's what we like best here at IHMC. Develop real-world, practical solutions to actual issues people are experiencing during military operations." 



Research Associate Savannah Ripley has been testing iterations of haptic tactile selectors on flight gloves as part of Dr. Jeff Phillips' human performance research team.

IHMC researchers collaborating with American Magic yacht racing team to maximize performance

New York Yacht Club American Magic's move to Pensacola has brought about a collaboration with the Florida Institute for Human and Machine Cognition (IHMC).

Since 2018, the professional sailing team has used the Port of Pensacola for seasonal training. In 2023, they decided to make Pensacola their permanent home. This strategic move is expected to generate 170 jobs in advanced manufacturing, engineering, design, and high-tech research and development.

The collaboration originated when Pensacola Mayor D.C. Reeves included IHMC on a city tour with the yacht racing team.

"Soon after this introduction, members of the IHMC team toured the American Magic facilities, and the brainstorming began," said Ryan Tilley, IHMC's director of strategic program execution and innovation.

Leading the collaboration for IHMC has been Research Scientist Dr. Matt Johnson. Johnson said that on the tour, the team highlighted a number of technical challenges they were working



The New York Yacht Club American Magic. Credit: American Magic team.

on, including improving the interface used by the crew.

"They are constantly developing and testing new ideas," Jonson said. "Considering IHMC's experience designing interfaces for advanced technology, it was a natural fit between the two organizations."

Johnson's research areas include human-machine teaming, human-machine system design, human-centered computing, human-machine interface design, and multi-robot control.

The goal of any new interface design is to improve the team's overall performance. Johnson says the interface design challenge is complicated. "Not only is the yacht itself complex, but it is also part of a greater system that involves eight crew members, each with their specific roles."

American Magic can be described as an "airplane on water... operated in a harsh, unforgiving environment where success hinges on narrow margins." Johnson says. "The interface plays a crucial role in seamlessly integrating the crew with the yacht, ensuring that each crew member has access to the essential information

required to fulfill their respective roles."

During a race, the demands on the team are extraordinary, so improving their ability to interpret system status quickly and intuitively is the goal.

Johnson says IHMC has completed an initial analysis, and the human-centered assessment approach has already proven helpful to the American Magic team.

Working with IHMC on this project has benefited the team tremendously, said Anderson Reggio, Performance Manager of NYYC American Magic.

"It has allowed our engineers to integrate ideas and suggestions from skilled subject matter experts that we do not typically encounter in the yachting world," Reggio said. "It has been a phenomenal start to our relationship, and we hope that it will provide us with a competitive edge when we begin racing in Barcelona."

Tilley expressed optimism that this collaboration is the beginning of a long and fruitful partnership: "We look forward to a long-term relationship providing solutions for the American Magic team and hope to play a small role in their future victories." ✨



Dr. Matt Johnson

SkillBridge supports veterans making transition to civilian work at IHMC

The transition from military to civilian life comes with challenges, including how to translate that experience into the civilian workplace.



Former SkillBridge intern Meredith Yeager

The Florida Institute for Human and Machine Cognition (IHMC) is proud to be part of a U.S. Department of Defense (DoD) program to help close that gap.

SkillBridge is a DoD program to give military personnel civilian work experience in the last 180 days of their service career — a bridge from one world to the next. This spring, IHMC renewed its commitment to the program becoming a SkillBridge worksite.

The DoD covers salary and benefits while in the program, which allows IHMC to train and leverage highly skilled service members in preparation for permanent roles at no cost, said Ryan Tilley, IHMC's director of strategic program execution and innovation.

"SkillBridge gives IHMC early access to the experience, skills, and unmatched work ethic service members bring to the table," Tilley said. "It's a huge benefit."

The SkillBridge partner vetting process was updated in January 2023. As part of that process, IHMC had to craft a comprehensive training plan and model

the job description for the role that the service member may fill.

That included details such as job description, length of training, detailed timeline, defined training modules, specific learning objectives, instructional models, instructor qualifications, assessment/grading rubrics, as well as goals and training outcomes, Tilley said. Once approved, IHMC executed a Memorandum of Understanding (MOU) with the DoD to formalize its program.

A SkillBridge internship was the perfect way for Meredith Yeager to transition from a 24-year career in the U.S. Navy to a role at IHMC.



Meredith Yeager leading a recent Science Saturdays

Yeager, who retired as a captain, is now a senior research associate, parlaying her experience in program management and process improvement into a similar role with the human performance team.

As an SkillBridge intern, Yeager worked with IHMC Senior Research Scientist Jeff Phillips on studies to counter the impacts of dehydration and hypercapnia on aviators; to develop a pressure-resistant, diver mask-fitted oculometric neurologic assessment tool; and other human performance research projects.



Meredith Yeager leading a recent Science Saturdays

She gained insight into proposal writing and the research process while leveraging her skills in managing government contracts including financial management and administrative contract support.

Yeager says the experience eased her transition with very little stress and helped her develop ties to a new organization.

"I couldn't have asked for a better experience, and I am very thankful for the opportunity at IHMC," she said.

SkillBridge is just one part of IHMC's commitment to and connection with the military community. Dr. Kenneth Ford, IHMC's founder and CEO, is a U.S. Navy veteran.

"The skillsets that veterans have brought to our organization are innumerable, and we are grateful for the chance to help our military members be successful in their encore careers," Ford said.

In 2023, IHMC was recognized for the second time in three years by the U.S. Department of Labor with a HIRE Vets Gold Medallion Award. To be eligible for the award, 7 percent of a company's workforce must be veterans. Between its Pensacola and Ocala branches, 14.8 percent of IHMC's new hires last year were veterans. ✦

Seven IHMC colleagues honored this summer with emeritus status for their contributions

At the Florida Institute for Human and Machine Cognition, (IHMC) we stand on the shoulders of those who have come before us.

In June 2023, IHMC honored seven colleagues who helped build the Institute from a small room in the computer science department at the University of West Florida into a research center with an international reputation in artificial intelligence, computer science, robotics and exoskeletons, and healthspan, resilience, and performance research.

“Without the contributions of these individuals, IHMC quite simply would not be where it is today,” said Founder and CEO Dr. Ken Ford. “Their own sense of commitment to excellence inspired, and continues to influence, the culture of IHMC. We are grateful to each of them.”



DR. JAMES ALLEN, SENIOR RESEARCH SCIENTIST EMERITUS

Dr. Allen is a pioneer in artificial intelligence with substantial contributions to natural language understanding research. He is a professor emeritus at the University of Rochester where he has been on the faculty since 1978. Dr. Allen joined IHMC in 2006 and served as an Associate Director. Computational linguistics is at the root of speech recognition systems, text-to-speech synthesizers, automated voice-response systems, internet search engines, text editors, language instruction material and more. His research uniquely combines what often are treated as separate fields in artificial intelligence — knowledge representation and reasoning, language understanding, planning, intention recognition, and machine learning.



DR. JEFFREY M. BRADSHAW, SENIOR RESEARCH SCIENTIST EMERITUS

Dr. Bradshaw is a pioneer in automated knowledge acquisition and multiagent systems. His book “Software Agents” is a classic in the field of multiagent systems and is one of several books he has authored. Since 2000, the research group Dr. Bradshaw led at IHMC developed a framework for distributed systems management and human-agent-robot teamwork. This framework has been used in scores of government-sponsored and commercial projects for network management, secure policy-based governance of complex systems, and for the coordination of human-robot teams.



DR. ALBERTO CAÑAS, SENIOR RESEARCH SCIENTIST EMERITUS

Dr. Canas is a co-founder of IHMC, an innovator in knowledge modeling and the creator of CmapTools, a software tool used by schools, businesses, and organizations across the globe. His IHMC research projects include knowledge modeling, performance support systems, collaborative tools for education and research, distance learning, and corporate memory. CmapTools is an outgrowth of Dr. Cañas’ interest in the use of technology in the K-12 education system. Before going to the University of West Florida, he was the director of IBM’s Latin American Education Research Center in Costa Rica. His research includes the use of computers in education, knowledge management, knowledge acquisition, information retrieval, and human-machine interface.



DR. WILLIAM J. CLANCEY, SENIOR RESEARCH SCIENTIST EMERITUS

Dr. Clancey's computer science research relates cognitive and social science in the study of work practices and the design of agent systems. Before joining IHMC in 1997, Dr. Clancey was at the Institute for Research on Learning in Menlo Park, Calif., from its founding in 1988, where he co-developed the Brahms multiagent work practice modeling and simulation system. At the NASA Ames Research Center, Clancey served as Chief Scientist of Human-Centered Computing in the Intelligent Systems Division, his team developed the Mobile Agents software that automates file processing between Mission Control and the International Space Station. At Stanford's Knowledge Systems Lab, he developed some of the earliest AI programs for explanation, meta-level reasoning, the critiquing method of consultation, tutorial discourse, and student modeling.



DR. ROBERT HOFFMAN, SENIOR RESEARCH SCIENTIST EMERITUS

Dr. Hoffman is a recognized leader in cognitive systems engineering and human-centered computing. His research has centered on knowledge modeling, work analysis, cybersecurity, expertise studies, and several other areas. Dr. Hoffman has been recognized internationally in cognitive systems engineering, applied psychology, artificial intelligence, and human factors engineering—for his research on the methodology of cognitive task analysis and human-centering issues for human-systems integration systems technology. He has co-authored and co-edited 18 scholarly books and is co-author on over 100 publications in peer-reviewed journals.



TIM WRIGHT, DEPUTY DIRECTOR EMERITUS

Vice Adm. Tim Wright joined IHMC in 1996 as deputy director after having served for 35 years in the U.S. Navy. As a Naval aviator, he served primarily in fighter squadrons during his active flying career. He commanded a fighter squadron, a carrier air wing, a fleet oiler, an aircraft carrier, a carrier battle group and the U.S. Seventh Fleet. He holds a bachelor's degree in engineering from the Naval Postgraduate School in Monterey, Calif., and a master's degree in public administration from George Washington University. He also is a graduate of the Industrial College of the Armed Forces at the National Defense University.



CAROL CARLAN, BOARD OF DIRECTORS EMERITUS

Carol Carlan was the inaugural chair of IHMC's Board of Directors and now serves as the Institute's director of philanthropy. Her leadership helped guide the Institute from its early years to its status as a premier research institution. Her banking career spanned more than 35 years culminating in serving as the first female president of a large regional bank. As the President of the Ascension Sacred Heart Foundation, she led one of the largest capital campaigns in the region, resulting in a new children's hospital and expansion of children's services in the Destin market. As President of Carlan Consulting, she is a founding member of the John Maxwell Team, a global training organization for leaders with more than 50,000 members worldwide. Among the numerous accolades she has received: Pensacola Chamber PACE Awards recognized her as the Spirit of Pensacola and Business Leader of the Year, Leadership Pensacola gave her the Blue Angel Leadership Award, a participant of the Leadership Florida Class of 2011-2012, recognized for her many years of work as a Trustee of the Pace Center for Girls State Board of Trustees she was awarded the 25th anniversary Pioneer Award.

Construction of new research complex is on target for completion in early 2024



A view of the construction site from October 2023

The summer has seen marked progress on a new research complex that will expand the Florida Institute for Human and Machine Cognition (IHMC)’s Pensacola campus.

In June, the project marked a milestone, “topping out” the planned \$40 million Human Resilience and Performance Research Complex (HRP). “Topping out” is a builders’ rite traditionally held when the last beam (or its equivalent) is placed atop a structure during its construction.

Work on the HRP complex has progressed steadily since the ceremonial groundbreaking in February 2023. The building is expected to be complete and ready to occupy in early 2024, said Phillip Turner, IHMC’s director of architectural and engineering services.


The building is taking shape, especially as exterior waterproofing and windows, exterior brickwork, roofing and roof insulation are being installed. Site utilities and site grading are under way and interior work, too, is progressing.

“It has been particularly exciting to see the complex take shape in the downtown skyline,” Turner said.

The building, once completed, will increase IHMC’s footprint in downtown Pensacola, which we have called home since 1999.

The 40,000 square-foot complex, the next chapter in IHMC’s journey of innovation and collaboration, will be a leading-edge lab and office building that will create a research hub in Northwest Florida with the potential to lead the field. The facility is an investment in the intellectual capital of the region, creating a research hub that will draw leading scientific minds to the region.

DAG Architects, partnered with Atlanta-headquartered Cooper Carry, designed the building. Brasfield & Gorrie leads the construction of the facility located at the corner of Garden and Alcaniz streets in Pensacola.

When complete, the new research complex will expand IHMC’s downtown Pensacola campus to three primary buildings and will complement the Levin Center for IHMC Research, which primarily houses research in robotics, human-machine teaming, and intelligent networked systems. 



A view of the construction site from October 2023

Robotics Camp ignites local students' STEM excitement through hands-on learning

This summer, the ordinarily quiet classrooms of the Florida Institute for Human and Machine Cognition's Pensacola and Ocala campuses became engineering playgrounds as part of 2023 Summer Robotics Camp.

Over the course of four, one-week sessions, 66 middle and high schoolers got these hands-on experiences and more designing their own LEGO robots, learning the basics of computer programming, and interacting with researchers.

"We are reaching out to the next generation of scientists, helping them to discover what their future might look like," said Dr. Ursula Schwuttke, IHMC's Director of Educational Outreach.

Any future in STEM requires strong teamwork and problem-solving skills. Robotics Camp teaches that.

Under the guidance of IHMC staff and volunteers from local high schools, campers worked in pairs to assemble LEGO Mindstorms robots. Students then used a block-based, visually appealing

coding language to guide their creations through mazes and obstacle courses, debugging code and redesigning robots as they went. Campers attending the second Ocala session also learned how to program in Python.

"You don't get too many chances to actually mess around with robots in day-to-day life," said Max Truong, a former Science Saturdays attendee who is now a senior at Tate High School and a Pensacola camp volunteer. "Giving the kids that opportunity to build and code something themselves is pretty great."

In addition to real-life engineering experience, Robotics Camp also provides students with inspiring professional role models. During the daily "Lunch With a Scientist" sessions, IHMC researchers explain their work and answer campers' questions over a meal.

In Pensacola, these sessions included an interactive virtual reality demonstration from Senior Research Associate John Carff and Research Scientist Dr. Matt Johnson, exoskeleton exploration with Research Scientist Dr. Gwen Bryan, an introduction to brain science and human performance research from Research Scientist Dr. Toshi Miyatsu, and the ever-popular IHMC robotics lab tour. Heath Parr, a teacher at Brown-Barge Middle School, provided the daily robotics challenges and instructions.

In Ocala, campers learned about computer game design with Research Scientist Dr. Ian Perera, natural language processing with Dr. Archana Bhatia, and AI with Senior Creative and Multimedia Specialist William Howell.

Quantum Improvements Consulting Senior Scientist Dr. Cheryl Johnson shared the concept of human factors with campers, and Rachel Farmer and Ben Thompson, both from Lockheed Martin, gave presentations on careers in engineering.

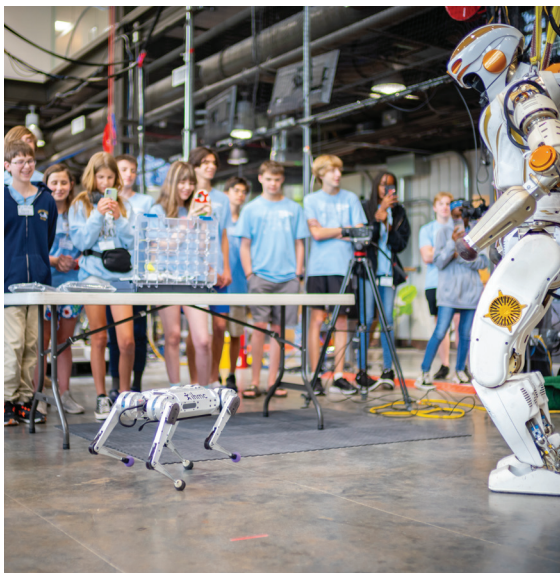
"Sometimes you see a camper really awed by a one-on-one opportunity with an individual scientist," said Schwuttke, recalling the connection that formed between Dr. Gwen Bryan and eighth-grader Sonja Christiansen.

"We had a lot of interests in common, and I thought that was awesome," said Sonja about her conversation with Bryan. Schwuttke hopes that personal interactions like these will serve as turning points in the lives of STEM-curious campers.

Inspiring students to engage with science and engineering is a core part of IHMC's community outreach, but not all local students have equal access to high quality STEM education experiences. To bridge this gap, IHMC provides free camp registration and lunch to qualifying students. These need-based scholarships are made possible by donations from sponsors, including Cox, Lockheed Martin, CareerSource, the Mid-Florida Regional Manufacturers Association, and the Escambia County Sheriff's Office.

"I always thought that I might want to pursue robotics and engineering," said rising eighth-grader Davis Coleman, an exceptionally enthusiastic Pensacola participant. "After camp, now I know that I do."

Touring the robotics lab, designing a robot of his own, and meeting with research scientists all combined to spark a new career goal for Davis: "I hope one day after school I can come back to work at IHMC." ✨



Students in the robotics lab during 2023 camp week

Back-to-school means Science Saturdays are back

The Florida Institute for Human and Machine Cognition is where Gabriela Sullivan's passion for science education initially flourished.

This fall, she's coming back to share it with the next generation.

As a high schooler, Sullivan was a regular volunteer at IHMC's Science



Gabriela Sullivan

Saturdays STEM enrichment program for students in grades 3 through 6. She remembers being in awe of the researchers and teachers who could encourage and inspire a room full of young minds.

"Their ability to convey complex concepts in a way that was both understandable and exciting fascinated me," she said. "It made me want a career that involved science education."

She made that dream a reality. Sullivan graduated from the University of Florida and now works for the City of Ocala as water conservation coordinator. She will lead a Science Saturday of her own at the Ocala campus. Her chosen topic will be healthy wetlands.

"Today's youth will be the scientists of tomorrow, and throughout my session, I want students to feel engaged and included, knowing that there is a place for them in the field of science," she said.

For nearly 16 years, Science Saturdays has been opening doors for kids like

Sullivan. IHMC's popular monthly science enrichment series starts its next season Sept. 30 in Pensacola and Sept. 9 at the Ocala campus. Sessions slated for the fall include science of the mind, game design, healthy wetlands and more.

Dr. Ursula Schwuttke is the director of educational outreach for both IHMC's Pensacola and Ocala campuses. Schwuttke says that the impact of the series is what keeps it compelling for families — and for IHMC staff.

Sometimes the impact is immediate — seeing the spark of imagination and engagement in a child's face. Sometimes the reveal takes longer, but the payoff is immense.

Sullivan is a perfect example of that. "Knowing that I can share my knowledge with students is a full-circle moment," Sullivan said. "What makes it even more exciting, is that I get to talk about the science of water and wetlands, two areas of study that are often overlooked, but incredibly important to maintaining healthy a society."

Roman Bassett is a Pensacola High School graduate who now attends the University of Florida studying mechanical engineering. Bassett was a Science Saturdays volunteer in Pensacola and said it was an experience that made him realize how deeply invested in subjects he could become. It also helped him realize how much he enjoyed teaching and learning together, including both with younger students and with peers.

He still distinctly remembers lessons from Science Saturday, including homemade electric motors and paper planes. He hopes that future Science Saturdays attendees leave with the same message he took from the experience: Have fun learning.

"Exploring your interests and learning cool new things is one of the most exciting things you can do" he says.

Science Saturdays

The schedule for Science Saturday for the Fall is complete. Share the link with friends with children in grades 3-6 https://www.ihmc.us/life/science_saturdays/

Pensacola Sessions

- Sept. 23: Science of the Mind, Dr. Kevin Gluck
- Oct. 28: Electric Motors, Dr. Robert Griffin
- Nov. 18: Computer Game Design, Heath Parr, Brown-Barge Middle School
- Dec. 17: Illusions, Dr. Toshi Miyatsu

Ocala Sessions

- Sept. 8: The Lives of Moths, Dr. Andrei Sourakov, University of Florida
- Oct. 7: Arash Mahyari, Electric Circuits
- Nov. 11: Computer Game Design, Dr. Ian Perera
- Dec. 2: Healthy Wetlands, Gabriela Sullivan, City of Ocala



Premier Community sponsorship from Florida Power & Light for the school year supports the Series. Pensacola annual sponsor is Cox, and season sponsors are Escambia Sheriff's Office, Florida Blue Foundation, Barnes Insurance, and International Paper Foundation. Ocala sponsors are Cox, Ron and Phyllis Ewers, and Precision Sidewalk Safety. ✨

Welcoming new research scientists and research associates

Our team is always growing, and we are pleased to welcome new team members into the fold at the Florida Institute for Human and Machine Cognition.

With a reputation for excellence that extends across all of our core disciplines, IHMC is always focused on re-examining the relationship between humans and machines. With our beginnings rooted in artificial intelligence and machine-learning research, we have expanded steadily over the years to welcome experts in computing, cognitive psychology, linguistics, robotics, engineering, biology, exercise physiology, and more.

Our work is exciting and our standards are high. We welcome inquiring minds with a cross-disciplinary outlook to join us.



DR. BRIAN JALAIAN, RESEARCH SCIENTIST

Dr. Brian Jalaian joined IHMC in May 2023 and is an associate professor in the department of Intelligent Systems and Robotics at the University of West Florida. He joined IHMC to develop a multidisciplinary modern machine learning team capable of solving specific private and public sector problems in artificial intelligence and autonomy. His research interests are robust machine learning, deep learning, uncertainty quantification for machine learning, AI safety and security, AI assurance, optimization, and network science. Previously he served as a technical STEM leader in AI Test & Evaluation and as a machine learning research scientist in the public sector. He was also an adjunct faculty in the department of electrical and computer engineering at Virginia Polytechnic Institute and State University. He earned his Ph.D. and master's degrees in electrical engineering, and a master's degree in Industrial and Systems Engineering, all from Virginia Tech.



BEOMYEONG PARK, SENIOR RESEARCH ASSOCIATE

Beomyeong joined IHMC in September 2023 working with Dr. Sylvain Bertrand and his team on the Squadbot v2 project. His research interests include walking and tele-operation of humanoid robots. He earned a Ph.D. in engineering from Seoul National University, where he also is conducting post-doctoral research. His first impression of IHMC was in the team garage during the DARPA Robotics Challenge Finals in 2015, where the fun, collegial atmosphere was highly appealing. The Nadia video that was released in 2022 convinced him that IHMC was the best place to combine the experience of humanoid robot walking research with the experience of preparing and leading an avatar competition.



HENRY ARNOLD, RESEARCH ASSOCIATE

Henry joined IHMC in September 2023. He is working on haptic gloves with Dr. Jeff Phillips and his human performance team. He earned his bachelor's degree in psychology from Florida International University in 2022. While at FIU, he gained research experience in areas including spatial cognition development, language, and attention. He plans to pursue a graduate degree in human factors, with a particular interest in human-computer interaction. In his free time, Henry enjoys playing soccer, exercising, and playing video games.



SOPHIA BAMMAN, RESEARCH ASSOCIATE

Sophia joined IHMC in June 2023 working with Dr. Zachary Graham, Kana Meece and the human performance team on the oxytocin study and other projects. She graduated from the University of Alabama at Birmingham with a bachelor's degree in chemistry and a minor in forensics. She was an IHMC intern in 2022 with the human performance team. Sophia looks forward to the chance to leverage her knowledge at IHMC, gain new skills and grow professionally. When she's not working or studying, Sophia enjoys watching documentaries and reading, especially when the topic is true crime.



MATTEO BASSANI, RESEARCH ASSOCIATE

Matteo joined IHMC full-time in October 2023 after previously serving as an intern. His main research interests are machine learning and artificial intelligence all around, and he is focusing his studies on reinforcement learning applied to networking and communication protocols. He joined Dr. Niranjani Suri's team to enhance his knowledge and understanding of these technologies. He had been a student at the University of Padua, Italy, pursuing his bachelor's degree in informatics engineering, and at the University of Ferrara, Italy, obtaining his master's degree in automation and informatics engineering. Through the school's international partnership program, he earned a master's degree in computer science at the University of West Florida. His hobbies include traveling, playing volleyball, playing video games, and cooking.



KAIN MILLER, RESEARCH ASSOCIATE

Kain joined IHMC as an intern in 2022 with the robotics lab under Dr. Gwendolyn Bryan, Jared Li, and the rest of the Exo team. In May of 2023, Kain joined the Exo team full time as a research technician, helping with repairs, experiments, and 3D printer maintenance. He is a graduate of Corry Area High School, and a veteran of the United States Army. He looks forward to using his time at IHMC to further his skill set and to learning as much as he can. In his free time, he enjoys cooking, writing, and running and playing Dungeons and Dragons with his allies.



ANMOL PATIL, RESEARCH ASSOCIATE

Anmol joined IHMC in May 2023 working with Dr. Anil Raj and Dr. Brodie Mather on coding, data science and engineering, natural language processing and other related areas. His work will include the Proteus project writing algorithms and building software systems to manage, process, and make data resourceful for research. Anmol interned at IHMC in May 2022, working closely with Dr. Brodie Mather in the field of natural language processing. He enjoys playing pickle ball with friends, spending time working out, and traveling.



TREVOR PERRY, RESEARCH ASSOCIATE

Trevor Perry joined IHMC in October 2023 working with Dr. Jeremy McAdam and the human performance research team. Trevor's work will include building out the data collection tools to support the HRP team's efforts. He earned a bachelor's degree in business administration at the University of West Florida and attended the Flatiron School, becoming a full-stack software engineer. He says he is energized by fast-paced environments and motivated to help companies develop user-friendly systems, optimize efficiency and streamline processes. That's a big part of why he chose to join IHMC, seeing it as a great opportunity to engage in interesting research with the potential to be part of something that can lead to helping people. Outside of work, Trevor enjoys spending time with his wife and daughter, as well as being with friends and playing basketball whenever he gets the chance.



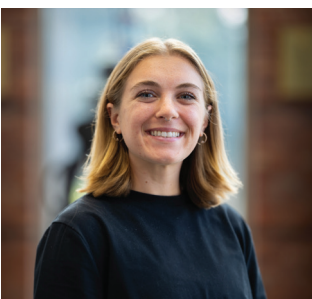
RICARDO REYES, RESEARCH ASSOCIATE

Ricardo joined IHMC in September 2023 working on the Sandia exoskeleton project with Dr. Gwen Bryan and her robotics team. He comes to IHMC from the Stanford Biomechanics Lab, where he gained experience in mechanical design, human biomechanics, controls, and human subject testing. He earned bachelor's and master's degrees in mechanical engineering at Stanford. He also served as CFO of My College Journey Academy, a community outreach program that offers help to first-generation high school students as they navigate the college and scholarship application process. His passion is in designing and developing systems that help humans do what was once physically impossible to do or regain the ability to do what once they could do.



BENNY RUIZ, RESEARCH ASSOCIATE

Benny joined IHMC in June 2023, working with Dr. Marcas Bamman and the human performance team on the oxytocin project. He earned bachelor's and master's degrees in exercise science at the University of West Florida. His work as a graduate research assistant included managing the molecular and cellular exercise physiology laboratory. He also worked at Ascension Sacred Heart as a lab assistant and at Baptist Healthcare as an exercise physiologist. His graduate thesis focused on the effects of endurance exercise on non-alcoholic fatty liver disease type-2 diabetes. Benny enjoys hiking and other outdoor activities, watching soccer and spending time with his wife and daughter.



KATHERINE VANSELOW, RESEARCH ASSOCIATE

Katherine joined IHMC in October 2023 working with Dr. Zach Graham and Kana Meece and their team on human performance research. Katherine came from private sector work as a molecular technologist and specimen processor. She is a licensed Molecular Technologist through the Florida Board of Health and certified by ASCP but realized that research was her passion. She is interested in cancer biology, immunology, and genetics. She earned a bachelor's degree in genomics and molecular genetics from Florida Institute of Technology. Molecular biology is one of her top interests and studying it in school opened up opportunities to contribute to a textbook and more. She is passionate about learning and is eager to expand her knowledge with the IHMC team. Outside of work she loves reading, being outside, gardening, running, lifting, yoga, reiki, and espresso.

Pensacola lectures feature experts in robotics, healthy aging, metabolism, intermittent fasting, and more



NIC RADFORD

Nic Radford wants us to love ocean exploration the way we romanticize space exploration. He is an engineer, roboticist, inventor, and entrepreneur who spent 14 years at Lyndon B. Johnson Space Center's Dexterous Robotics Laboratory at NASA in Houston. He launched the Fall 2023 lecture series in Pensacola talking about his work as founder, president, and CEO of Nauticus Robotics Inc., a company that creates and deploys autonomous marine robotic systems. "Space flight dominates our romantic thinking. I'd like to see us explore Mars, but there are a lot of pressing challenges here on Earth, and those pressing challenges could use investment."



DR. STEPHEN ANTON

Anton has spent his career looking at the influence of lifestyle on healthy aging and chronic diseases including obesity, cardiovascular disease, and metabolic syndrome. His October lecture focused on the importance of stress and recovery in healthy aging. Anton previously has been a featured guest on IHMC's podcast, STEM-Talk, highlighting how eating and exercise behaviors can influence obesity, cardiovascular and metabolic conditions. An alumnus of the University of Florida, Anton is a professor in the department of physiology and aging at UF. He is an expert on intermittent fasting and exercise. In 2018, he co-authored the book, The Man Diet.



DR. JEFF PHILLIPS

Phillips is a Senior Research Scientist at IHMC who develops mitigation strategies for common environmental, physiological, and cognitive stressors that break down optimal performance in military operators. His November lecture was "Human Behavior and Matters of the Mind: Trapdoors and Triumphs." Despite the beauty and complexity of the human mind, it has flaws. Phillips' talk featured a lighthearted journey into the human psyche and explore some of our most common flaws. Phillips also shared effective strategies to overcome these pitfalls and strive toward a more productive and happy life.



DALLAS LITTLE

Little's expertise includes the built environment and his research interests include asphalt technology, pavement design, soil stabilization, fracture mechanics, soil mechanics and foundation engineering. He has served as principal investigator on more than \$35 million in research. Little was the first senior research fellow at the Texas A&M Transportation Institute. He is a widely sought-after consultant and expert witness on projects related to infrastructure performance and forensic studies who has served on many advisory and executive committees. He is a distinguished member of the American Society of Civil Engineers and has given hundreds of lectures, published hundreds of journal publications, has contributed to five books.

Ocala lectures feature experts in AI, human performance, and more



DR. ALEXANDER FLEMING

Fleming is founder and executive chairman of Kinexum, a company of professionals with diverse expertise in developing drugs, biotech products, including gene and cell therapies, medical devices, and digital health technologies. His long career included time as head of clinical review at the U.S. Food and Drug Administration for diabetes and other metabolic and endocrine disorders, growth and development, elevated lipids, and reproduction. In his lecture, “Targeting Healthy Longevity,” Fleming shared details about how we can increase healthy longevity beyond the common-sense measures of physical activity and good nutrition. Human studies are starting to be done on drugs and other products that slow or even reverse aging. Fleming reviewed the science of slowing the aging process and increasing healthspan.



DR. LORI MARINO

Lori Marino is a neuroscientist and adjunct professor of Animal Studies at New York University. She is the founder and president of The Whale Sanctuary Project and executive director of The Kimmela Center for Scholarship-Based Animal Advocacy. Her work focuses on the evolution of the brain and intelligence in dolphins and whales and on the effects of captivity on wildlife. Her lecture, “Changing the Scenery for Captive Whales,” recapped The Whale Sanctuary’s global movement to improve conditions for these highly complex, large-brained social mammals. She spoke about sanctuaries where captive whales can feel the ocean and be free to explore a natural environment while under human care.



DR. NIRANJANI SURI

Suri is a Senior Research Scientist and Associate Director at IHMC, the Division Associate for Research in the Military Information Sciences Division at the U.S. Army Research Laboratory, and a Director of Research Professor in the Intelligent Systems and Robotics Program at the University of West Florida. His research focuses on networking, communications, distributed systems, information management, interoperability, Internet of Things (IoT), and the application of machine learning in these domains. One of his focus areas has been on the topic of Value of Information (VoI) and its application to reduce operator overload and to alleviate communications bottlenecks. He has co-chaired groups on Military Applications of IoT and Tactical Group Communication and Information Dissemination.



DR. MORLEY STONE

Stone is IHMC’s Chief Strategic Partnership Officer. He served as the Senior Vice President for Research at The Ohio State University. More than a decade after publishing *The Quantified Warrior*, Stone sees a transformative future exists for redefining healthspan, resilience and performance with the rapid pace of technological improvement of wearables. In his lecture, Stone will talk a feedback loop called Sense-Assess-Augment, a concept that underpins his view of the quantified human. Prior to OSU, he served as the Chief Technology Officer for the Air Force Research Laboratory (AFRL). Before that, he served for more than six years as the Chief Scientist of AFRL’s Human Performance Wing. From 2003 to 2006, he was program manager in the Defense Sciences Office at the Defense Advanced Research Projects Agency (DARPA).

STEM-Talk experts talk climate, pain management, human space flight, sports medicine, and much more

From the health impacts of human spaceflight to the critical role of protein in health, muscle-building, and disease, STEM-Talk listeners continue to hear from the brightest minds in science and technology.

STEM Talk hosts Dr. Ken Ford, IHMC's CEO and founder, and Dawn Kernagis, research scientist, have conversations with experts and thought leaders in many disciplines. With more than 4 million total show listens over 160 episodes, STEM-Talk is a home for full and frank conversations with the most interesting people in science and technology.

Visit <https://www.ihmc.us/stemtalks/> to keep up with the latest episodes.



DR. JUDITH CURRY, EPISODE 158

Dr. Judith Curry wants more people to appreciate the large uncertainties associated with climate science. It's why Curry has worked to fight "groupthink" in science, advocate for transparency, and engage critics. It is her way of keeping the conversation focused on the nuance that is a critical component of science and scientific discussion. Curry, president of the Climate Forecast Application Network, hosts the blog Climate Etc., a forum for climate researchers, academics, technical experts, and citizen scientists to discuss climate science and policy. She also is Professor Emerita of Earth and Atmospheric Sciences at the Georgia Institute of Technology. Her book, "Climate Change and Uncertainty: Rethinking our Response," offers a new way to think about climate change, the risks we face, and the way we respond.



DR. DON LAYMAN, EPISODE 157

Few people know more about muscle development than Dr. Donald Layman. As the world's foremost authority on dietary protein and amino acids, he is known for his extensive research on muscle development and his studies of metabolic regulation for obesity, diabetes, and cardiovascular disease. "Every protein in the body has a half-life," Layman says. "Some last an hour or two, some last 30 or 40 days. That's why we need to pay attention to protein turnover. How well we do this process of protein turnover has a lot to do with long term health and aging." Layman spent 31 years on the faculty at the University of Illinois Urbana-Champaign, where he is now a professor emeritus. His lab focused on understanding how metabolism works. Today, he works as Director of Research for the American Egg Board and is a nutrition consultant for the National Dairy Council and The National Cattlemen's Beef Association.



DR. JOSH HAGEN, EPISODE 156

Dr. Josh Hagen is director of the Human Performance Collaborative at The Ohio State University. While his team largely works with two populations — high-level athletes and the high-level military operators — the applications of what they learn could be far-reaching. At Ohio State, Hagen works with other performance science researchers to evaluate the physical traits and capabilities of athletes. They collaborate with coaches and athletic trainers to make adjustments in the weight room, on the field, and during recovery after training or competitions. Hagen also works on federally funded projects with Special Operations Command, The Air Force Research Laboratory, the Office of Naval Research and several private foundations. "We're trying to maximize human performance for all humans. That sounds like a ridiculous, broad objective, but that is really what we're trying to do," Hagen said. "Every one of us can be optimized to some level."



DR. CHRIS MCCURDY, EPISODE 155

What if the roots of a secret to treating chronic pain are in a Southeast Asian evergreen tree's leaves? Dr. Chris McCurdy has spent the last 15 years researching the medical efficacy of kratom and its alkaloids. On his return to STEM-Talk, he shares what he and his lab at the University of Florida have learned since his 2018 appearance. McCurdy and his lab received two major grants from the National Institute of Drug Abuse to investigate kratom to understand its therapeutic potential. Kratom has been used in herbal medicine for hundreds of years to boost mood, energy, and pain relief. It is increasingly recognized in research communities for treatment for chronic pain and its potential to alleviate opioid withdrawal symptoms. "We do need desperately for something to be as efficacious (as opioids) in pain treatment without the liabilities. And we see that kratom could be something promising in that area."



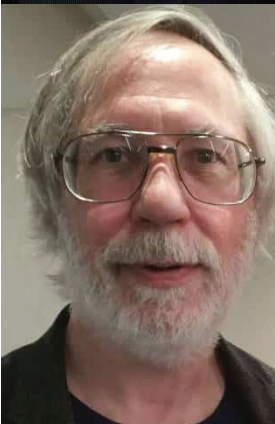
DR. BRIAN COLE, EPISODE 154

Dr. Brian Cole may have been inspired as a child to go into medicine by the low-key way that psychology, sociology and humor fit together on a classic 1970s sitcom, "The Bob Newhart Show," but he blazed his own path of excellence as a renown orthopedic surgeon. Cole specializes in cartilage restoration, orthobiologics, and advanced surgical techniques for the treatment of knee, elbow, and shoulder injuries. He is the team doctor for the NBA's Chicago Bulls and the co-team doctor for the Chicago White Sox. On this episode, Cole talks about his cutting-edge research into treating knee, shoulder, and elbow injuries. He also shares his novel approach to dealing with ACL tears and methods to enhance recovery time following ACL reconstructions. He also talks about the jump in ACL tears among 14- to 18-year-olds, which have increased by 148 percent over the past 10 years.



DR. DOMINIC D'AGOSTINO, EPISODE 153

Longtime listeners know of Dr. Dominic D'Agostino's reputation and his research into the physiological benefits of nutritional ketosis. Since his last STEM-Talk in 2019, a tremendous body of research has been done on the therapeutic potential of ketosis. The high-fat, low-carb diet has been linked to advances in the treatment of Alzheimer's, cancer, migraines, type-2 diabetes, psoriasis, sleep apnea, psychiatric disorders, traumatic brain injuries, and more. D'Agostino is an IHMC colleague and a tenured associate professor of molecular pharmacology and physiology at the University of South Florida. He also shares details about the NASA NEEMO project that sends astronauts, aquanauts, engineers, and scientists to live in a facility at the bottom of the Atlantic Ocean, as well as what he and his family have learned from life on a farm.



DR. MARK SHELHAMER, EPISODE 152

Dr. Mark Shelhamer is the former chief scientist of NASA's Human Research Program. He is an expert in neurovestibular adaptation to spaceflight. He is an advisor to the commercial and consumer spaceflight industry. This episode covers Mark's role in NASA's planned human mission to Mars and how he is investigating ways to maintain the health of astronauts on such a long-duration spaceflight. It also covers how those lessons can be applied to healthcare on Earth. He even shares how a Radio Shack Electronics Kit gifted to him by his uncle led this self-described "nerdy band kid" into a life of science. Shelhamer is an otolaryngology professor at the Johns Hopkins School of Medicine and is the director of the school's Human Spaceflight Lab.

IHMC's 2023 Interns

Learning is an ongoing part of what makes IHMC special. Each year, we host dozens of interns on our campuses. These students gain valuable research experience at a world-leading institution of excellence and innovation.

While we host interns throughout the year, the summer is the busiest season for welcoming these temporary team members. Our research teams welcomed students from across the world to join in the work that we do in robotics, machine learning, artificial intelligence, human resilience, and performance.



Kian Agrawala
Research: DARPA Artificial Social Intelligence for Successful Teams
School: Rutgers University



Madeline Alex
Research: PROTEUS
School: University of West Florida



Davin Anderson
Research: SqadBot2 and Nadia
School: University of West Florida



Thomasz Bialek
Research: Robotics Breaching Project
School: University of West Florida



Sean Bridges
Research: Exoskeleton
School: University of West Florida



Kevin Carff
Research: VR Workbench
School: University of West Florida



Zach Carter
Research: PROTEUS
School: University of West Florida



James Cornette
Research: Breaching Project
School: University of Oklahoma



Beatriz Rodrigues Domingues
Research: PROTEUS
School: University of West Florida



Dustin Evans
Research: PROTEUS
School: University of West Florida



Kyle Fox
Research: Robotics Squadbot
School: Embry-Riddle Aeronautical University



Robert Frei
Research: Robotics Nadia
School: University of Michigan



Raffaele Galliera
Research: Research with Dr. Niranjan Suri
School: Joint University of West Florida-IHMC Ph.D. program



Bryan Gonzalez
Research: PROTEUS
School: Embry Riddle Aeronautical University



Frankelly Guzman

Research: Augmentics

School: College of Central Florida



Sarah Lyell

Research: Data Visualization with

Cybersecurity Applications

School: Williams College



Zoe McCurdy

Research: APEX and COEUS

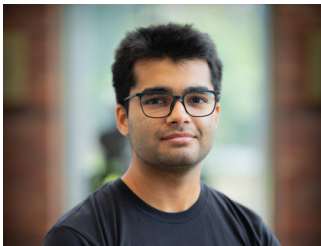
School: University of West Florida



Kellen McKenney

Research: Robotics Nadia

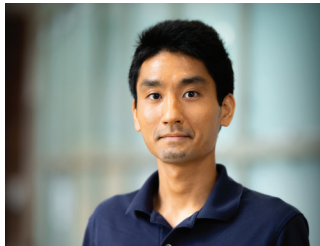
School: University of Florida



Achintya Mohan

Research: Robotics Rough Terrain

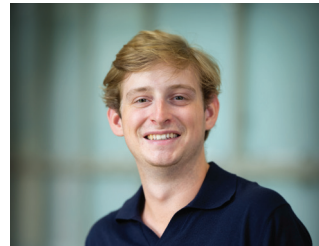
School: Georgia Institute of Technology



Kazuhiko Momose

Research: Breaching Project

School: Florida Institute of Technology



Peter Mougey

Research: SquadBot

School: Florida State University



Logan Oaks

Research: PROTEUS

School: University of West Florida



Maruf Bin Faruque Payel

Research: Cybersecurity, Data Analysis, and Data Visualization

School: Williams College



Nilantha Premakumara

Research: Neurosymbolic Artificial Intelligence

School: National Taipei University



Ben Shinnick

Research: DARPA Artificial Social Intelligence for Successful Teams

School: University of West Florida



Garhett Smith

Research: PROTEUS and Exoskeleton

School: University of West Florida



Garrett Witcher

Research: Research with Dr. Niranjan Suri and Daniel Duran

School: Pensacola Christian College



Savannah Watson

Research: PROTEUS

School: Creighton University



Bernard Wongibe

Research: CyberLab Project

School: Williams College



Alistair Xhayet

Research: Robotics Nadia

School: McGill University



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