



FLORIDA INSTITUTE FOR HUMAN & MACHINE COGNITION

ihmc

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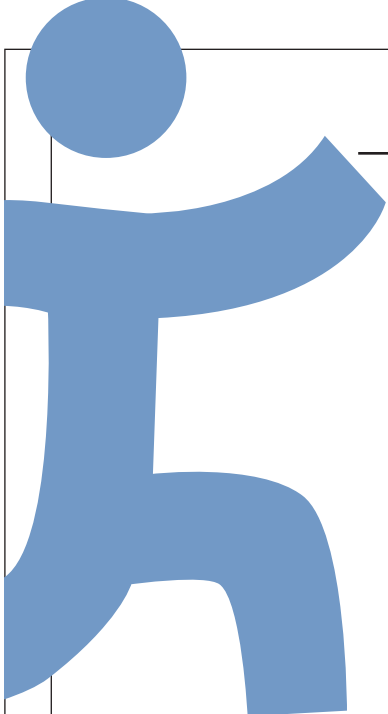
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Florida Institute for
Human & Machine
Cognition

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Dear Friends:

For IHMC, 2023 opened on a high note.

In February, we hosted a ceremonial groundbreaking for our new Healthspan, Resilience, and Performance Research Complex on the downtown Pensacola campus. Dirt has been moving quickly, pilings are being installed, and foundation piling caps are soon to follow. The electrical switchgear and generator, – items with a one-year delivery backlog, have been ordered. A “topping off” is planned for June and we are on track to complete the complex in 2024.

The groundbreaking event saw 150 people in attendance, including guests from our board of directors, state and local government, education, business, the private sector, and the community at large. Despite the blustery weather, the warmth of the support of our colleagues, friends, supporters, and residents was palpable and we are grateful to all of you who could be with us.

This \$30 million project, funded by IHMC with support from Triumph Gulf Coast and Space Florida, certainly expands the footprint of our main campus. We hope it will come to serve as the epicenter of a biomedical research hub of excellence in Northwest Florida. Growth of the economy driven by the development of intellectual capital and investments in basic and applied research is critically important to the diversification of this region’s future.

In this issue, we update a collaborative project between IHMC and the Air Force Research Laboratory for real-time assessment and augmentation of Airmen’s cognitive performance in long-duration missions in extreme environments. It is the latest in IHMC’s continued fruitful partnership with AFRL.

We also share progress on an Office of Naval research project using underwater eye-tracking technology to detect the early signs of neurological hazards in divers.

We are among the first labs in the world to purchase a new NovaSeq X Plus, which allows for next-generation sequencing capacity.

Until next time, best wishes,

Ken Ford



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A2PEX is closing the loop for human performance

How long can you sustain attention in a cognitively or physically demanding situation where a lapse in focus due to boredom or fatigue could have life-or-death consequences?

That's the question at the heart of a cooperative research project between the Florida Institute for Human and Machine Cognition (IHMC) and the Air Force Research Laboratory (AFRL).

Assessing and Augmenting Performance in Extreme Environments (A2PEX) aims for real-time assessment and augmentation of Airmen cognitive performance in long-duration missions in extreme environments.

The goal is to develop robust wearable devices and an integrated system that overcomes fatigue and stress by continually sensing, assessing, and augmenting human performance. The five-year project is sponsored by AFRL's Materials and Manufacturing Directorate and supported by the 711th Human Performance Wing.

Principal Investigators are IHMC's Dr. Morley Stone and Dr. Tim Broderick. The A2PEX initiative draws on team members from IHMC's human performance, robotics, and human-

centered computing teams, and on Stone's earlier work within AFRL on the Sense, Assess, Augment paradigm.

Broderick says A2PEX "...is developing and manufacturing materials and technologies that will allow us to sense key biomarkers of fatigue in extreme environments and to augment performance by mitigating fatigue. Aviation mishaps often are related to unrecognized fatigue and stress."

"If we can recognize and mitigate stress and fatigue, we can potentially save Airmen's lives," he says. "It is very hard to accurately measure the physiology and performance of a person during everyday activities – and even more so when a person works in an extreme environment such as an aircraft."

Academic partners in the project are The Ohio State University and Georgia Institute of Technology. Industry partners are Triple Ring Tech, Abbott Biowearables, electroCore, and Polar.

"We are excited about the possibilities of this program," says Regina Shia, program manager at AFRL. "IHMC has built a strong team with expertise that ranges from physiological and cognitive monitoring to materials and

manufacturing advances. With a closed-loop human sustainment for a long-duration mission's objective, this team could immensely impact the combat readiness and lethality for the Air Force."

Research agreement is key

Closing the loop for human performance has been a longtime interest for the researchers at IHMC. Indeed more than a decade ago Stone published on the concept of Sense, Assess, Augment — a human-centric control loop to improve performance.

"Without the cooperative research agreement, we would not have access to AFRL research infrastructure that allows us to move sense and augmentation concepts out of the lab and into relevant environments. It's a key component for us as we move into verification and validation before field testing," Stone says.

"We have a long-standing and productive relationship with the Air Force," Broderick says. "We're working with them in a collaborative way that is not typical. The collaboration benefits both parties and accelerates our results."

The first year of the project will focus on refining and testing partner devices at IHMC and in the STRONG Lab (at Wright-Patterson Air Force Base). Triple Ring and Ohio State University researchers are prototyping devices that will be tested in a joint exercise later in 2023. That exercise could include:

- Air Force special operators and medics using personal protective equipment during a 5-day surge;
- Aircrew during prolonged flights in the Pacific theatre;
- Remotely Piloted Aircraft (RPA) teams during high tempo, protracted missions; and
- Intelligence, Surveillance, and Reconnaissance (ISR) analysts during long shifts in classified facilities.



Dr. Morley Stone



Dr. Tim Broderick

Year two will focus on analyzing the data generated and revising prototype A2PEX devices and the integrated system.

The goal is to supply a sensor system that is comfortably wearable and doesn't pose a safety risk, yet still supplies accurate electrical and mechanical data in a range of hostile environments.

"If it's not able to be worn comfortably or if it gets in the way of doing a mission, it won't be used," Broderick says.

Polar, Abbott Biowearables, and Triple Ring are key to the effort to maximize adaptation of existing technologies to the needs and demands of the populations A2PEX will serve.

The Air Force is interested in what this might mean for aviators on long-duration missions, but it's not only pilots who could benefit. Personnel who engage in long-duration, high-cognitive load activities – such as pilots flying unmanned vehicles or analysts reviewing reconnaissance images – also could benefit from these findings.

A promising approach for A2PEX centers on noninvasive vagal nerve stimulation. The vagal nerves are gatekeepers of the autonomic nervous system. In this role, the nerves send messages that adjust cognitive function and alertness, which are especially important to those working for extended stretches of time under high-stress.

How A2PEX came to be

The thread of A2PEX can be traced back more than a decade, with ties to work Stone did with AFRL and work Broderick was part of with the Defense Advanced Research Projects Agency (DARPA), particularly with the Peerless Operator Biological Aptitude, (PEERLESS). The project was designed to increase the biological aptitude of warfighters to increase their adaptability and resilience in extreme conditions.

In those earlier years, researchers were gaining the ability to gather and use

quantitative data on how humans perform within systems. With that knowledge, researchers gained an opportunity to fill a gap in the optimization of a system that until then focused on how the technology performed — but hadn't accounted fully for the impact on the human operator at the heart of that system.

The confluence of neurology, biomarkers, and wearable technology made this a "sweet spot" for optimizing the performance of elite warfighters and the technologies they control. PEERLESS, and now A2PEX, originate at least in part from this space.

For A2PEX, the team is looking for the intersection of what researchers would like to measure, what materials and sensors need to be developed, and how interventions may enhance capability and safety in extreme environments.

While the focus has been on pilots on long-duration missions, Stone and Broderick both note that the same concerns about how fatigue and biology could impact cognitive focus and acuity, personnel in the cockpit are not the only warfighters for whom A2PEX's findings matter. Analysts working extended shifts in Sensitive Compartmented Information Facilities (SCIFs) and those working on Intelligence Surveillance Reconnaissance (ISR) also face demands on their attention and focus. They also may benefit from what is learned through the A2PEX effort.

The implications for military operators are clear, but the findings could ultimately produce benefits for long-haul truckers, commercial pilots on transoceanic routes, and medical personnel working lengthy shifts, Stone notes. ✦



A2PEX builds on IHMC's previous research on the Peerless Operator Biological Aptitude, (PEERLESS) project, pictured here, to increase the biological aptitude of warfighters.

Ground broken on new \$30 million human performance research complex on Pensacola campus

The Florida Institute for Human and Machine Cognition (IHMC) ceremonially broke ground on Feb. 3, 2023, on a new \$30 million project in downtown Pensacola, setting up the next chapter in the research institute's journey of innovation and collaboration.

The IHMC Healthspan, Resilience, and Performance complex will be a leading-edge lab and office building that will create a research hub in Northwest Florida for advancing human healthspan, resilience, and performance research.

The facility is an investment in the intellectual capital of the area, creating a research hub that will draw leading scientific minds to the region.

"This facility, and the people housed in it, really will be one-of-a-kind, and it will be a reputational jewel for our community and region," IHMC's Founder and CEO Dr. Ken Ford said.

"Once completed, this building will be a landmark for the community," said Dr. Pam Dana, IHMC's chief external affairs officer, who emceed the groundbreaking.

IHMC is funding the cost of the building. Partners on the project include Triumph Gulf Coast, a nonprofit corporation created to manage the funds from the settlement of the BP Deepwater Horizon 2010 oil spill disaster, and Space Florida, the entity charged with supporting and growing the state's aviation and aerospace industries. Triumph is funding a substantial portion

of the specialized research equipment to be housed in the new facility. Space Florida is collaborating with IHMC on research and technology.

"What IHMC represents in its research activities, grand vision, and direction is precisely what Triumph Gulf Coast seeks to support and encourage," said David Bear, chairman of the Triumph Gulf Coast Board of Directors.

"From here, bright minds from across the globe will join to collaborate, innovate, and develop ideas that may

complex, where members of our team will co-mingle with IHMC and its other strategic partners in military, industry, and academia, to further innovation and technological developments important to Florida's aerospace present and future."

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 the project is complete, it 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.

"We will be collaborating closely with

regional institutions and organizations that share an interest in human healthspan and performance, and these collaborations will lead to innovative spinoff opportunities and technology transfer," Ford said. "Certainly, the addition of this complex will bolster the regional economy through new jobs and funding in federal and industry-sponsored research."

"This facility, and the scientists and engineers that it will host, will allow IHMC to be one of the few research institutions able to work effectively at all



Construction of the new IHMC Healthspan, Resilience, and Performance Complex at the corner of Garden and Alcaniz streets is projected for completion in 2024.

fundamentally change the way we act, move, respond, heal," he said. "It is so cool that this amazing, next-generation research is happening from our beautiful city and from our wider region in Northwest Florida."

Howard Haug, executive vice president, treasurer and chief investment officer for Space Florida, said partnering with IHMC has been an exciting and rewarding collaboration.

"Partnerships are key to realizing amazing things," Haug said. "We look forward to the completion of this


levels, from a single molecule of interest to a whole human, and even teams of humans and machines,” Ford said.

“Innovation is place-based,” he said. “This exciting new research complex in the heart of historic downtown Pensacola will enable continuous interactions and frequent collisions of people and ideas across many academic disciplines. IHMC is fundamentally a collaborative habitat for innovation. The Human Performance Complex will advance our mission.”

The building also is a strong symbol of IHMC’s commitment to investing in Pensacola itself. IHMC was among the pioneers of seeing the potential of downtown, locating its headquarters in the city in 1999, after outgrowing its space from its beginnings on campus at the University of West Florida.

Delarian Wiggins, Pensacola City Council president, said it is encouraging to see IHMC’s continued dedication to and investment in the city.

“As a City leader, it’s exciting to know that IHMC’s success has sustained employment of more than 100 individuals from across the world, adding to the cultural diversity and international understanding within our community,” Wiggins said. “Your focus on promoting an environment where our citizens can ‘live, work, and play’ is a cornerstone of any successful community.”

The Human Performance Complex should be completed in 2024. 



“Thank you for leading the way in AI, research, and technology developments ranging from profound robotics research to life-altering sensory innovations, to now, next-generation human performance insights.”

Dr. William Dalton
Chairman of IHMC Board of Directors



“There’s nothing I’m more proud of than to know that (IHMC) planted here in Pensacola. Ken, you’ve staked your reputation on building hope and bringing the best minds and the best people to share that mission with you. We’re proud that you’re here and we look forward to the future.”

State Senator Doug Broxson
District 1



“Triumph’s investments have been targeted to make a difference in education, industry certifications, workforce training, business location and growth, infrastructure, and, now with IHMC, sophisticated research and development.”

David Bear
Chairman of the Triumph Gulf Coast Board of Directors



“Your success supports vibrant exchanges among researchers from within local establishments, increasing opportunities for residents working in the surrounding area.”

Delarian Wiggins
Pensacola City Council President, District 7

Space Florida partnership with IHMC building with more collaboration, HRP complex support

A partnership between Space Florida and the Florida Institute for Human and Machine Cognition (IHMC) has been quietly growing. Most recently, Space Florida contributed \$2 million.

When construction of IHMC's newest research building is completed in the summer of 2024, Space Florida will have office space in the new facility — additional evidence of how closely the two entities intend to work together.

"Among the topics our human performance team is exploring is how humans respond both physically and cognitively to stress and how we perform in extreme environments," said IHMC Founder and CEO Dr. Ken Ford. "Space is among the most extreme environments in which humans perform. Seen through that lens, a collaborative partnership between IHMC and Space Florida clearly benefits both entities."

Space Florida was created to support the growth and development of a sustainable and world-leading aerospace industry throughout the state. It promotes aerospace and space-related business development, business financing, spaceport operations, research and development, workforce development, and innovative education programs.

The space and aerospace-related sector fuels some \$19 billion of the state's economy. More than 17,144 aerospace-related companies call Florida home, according to the aerospace finance and development authority.

"It's been exciting for our team at Space Florida to work with IHMC in supporting its multifaceted research endeavors, many of which translate well into the realm of space and aerospace," said Howard Haug, Space Florida's executive vice president, treasurer and chief investment officer.

SPACE FLORIDA



The partnership creates another foothold for Space Florida's expanding presence in Northwest Florida, which includes an advanced manufacturing program at Pensacola State College, and the Leonardo Helicopter maintenance facility at Peter Prince Airport in Santa Rosa County.

Anna Alexopoulos Farrar, Space Florida's vice president for corporate communications, said the IHMC partnership is part of a mission-critical investment in research and development for the state's aerospace industry.

"The work with IHMC underscores the importance of extending our reach beyond one region," she said. "Florida isn't just competing with other states, we are competing with sovereign nations that operate within very different regulatory

systems. To emerge as a powerhouse of the aerospace industry and for aerospace capital, Space Florida has reached across county lines working with companies and organizations from the Panhandle to South Florida."

Farrar said that space no longer is solely about exploration — it's a strategic economic system that thrives with investment. From AI and robotics to health and resilience, this partnership will extend to areas that will fuel the aerospace industry for years.

"It's through research and development that we can revolutionize the way we explore our universe and solve complex problems of today and the yet to be imagined," Farrar said.

"Our mission is to make Florida the ground node, the leading global entity for the emergence of a space economy in low earth orbit," Farrar said. "With this continued partnership and investment between IHMC and Space Florida, the possibilities can be endless." ✨



Space Florida Executive Vice President Howard Haug, spoke at the groundbreaking ceremony.

Team crafts system to track neurological function in divers for Office of Naval Research project

An IHMC team has wrapped up a three-year project refining an underwater eye-tracking tool to detect early signs of neurological hazards seen by divers.

Neurologic decompression sickness, hypoxia, hypercarbia, and Central Nervous System (CNS) O₂ toxicity, all are hazards of working in undersea environments. Small eye-movement cameras, known as video-oculographic (VOG) systems, have been used extensively for clinical assessment of eye movements, a quantifiable marker of neurologic function.

In a project supported by the Office of Naval Research Undersea Medicine Program, the IHMC team modified the Pupil Labs ocular camera system into a waterproof form that fits in the U.S. Navy MK 20 full-face dive mask.

The Pupil Labs system is a mobile, open-source, natural gaze-based system validated across clinical and operational settings. The IHMC team is led by Senior Research Scientist Jeff Phillips and Research Associates Connor Tate and Savannah Richardson.

“Navy divers are exposed to harsh conditions and high levels of stress during submerged critical missions such as search and rescue or explosive ordinance disposal,” Tate said.

Standard laboratory eye-tracking



An IHMC team testing an underwater eye tracking system at Duke University.

systems provide reliable measures on neurological status, but, Tate noted, “there wasn’t yet a fully waterproofed device for monitoring and evaluating divers in the submerged environment until our team developed one.”

The IHMC-customized design allows for adjustable use in submerged, hyperbaric settings without compromising the VOG’s ability to effectively capture eye movements.

In early 2023, the IHMC team conducted human testing on the mask at Duke University’s Hyperbaric Medicine facility in Durham, N.C., to see if it would survive under water and if its interface works.

The system is waterproofed, pressure-tested for implosion and explosion,

and tested for electrical leakage — and it performed successfully in all these aspects, Phillips said. The system also was evaluated for data quality, ease-of-use, comfort, and the ability of the system to detect neurological changes associated with hypercapnia high CO₂ Levels.

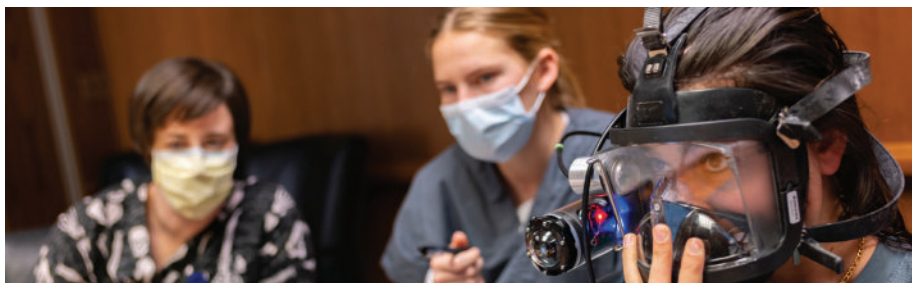
For upcoming data collection, hypercapnia will be induced in all participants as they dive with the underwater eye tracking system and a system that applies machine learning to the recorded audio of the individual to predict their inhaled CO₂ levels.

The combination will allow tracking of participants’ blink rates, fixations, and pupil light reflex, all of which are indicators of fatigue.

“We hope to find a positive correlation between our measures collected by the system and the participants’ CO₂ levels and perceived exertion,” Tate said.

Phillips said he was proud of what his team accomplished, especially in the face of the COVID-19 pandemic and its associated supply-chain disruptions.

“Connor and the team displayed immense pluck and resourcefulness despite this being the most difficult time in recent history to accomplish this research effort,” he said. ✦



An IHMC team led by Senior Research Scientist Dr. Jeff Phillips testing a prototype full-face diver’s mask fitted with an eye-tracking system to help detect early signs of neurological conditions that can indicate a diver is in trouble.

IHMC hosts experts in spatial disorientation to share best practices, review ways to mitigate risks

Humans evolved as terrestrial creatures, our senses bound by the planet's gravitational force to navigate and literally find our place in the world.

Once the capacity for human flight was developed, we slipped the surly bonds of Earth — and opened ourselves up to perceptual and visual distortions that can have deadly consequences in aviation.

In March 2023, the IHMC's Pensacola campus hosted a gathering of international experts in spatial disorientation, which is a leading cause of deadly mishaps in military and commercial aviation.

Over three days, 87 members of the Spatial Orientation Modeling Expert (SOME) Workgroup shared the latest techniques to model spatial disorientation mishaps and to showcase

the latest developments designed to mitigate the risk. The hope is to craft recommendations for future research aimed at improving pilot situational awareness and counter spatial disorientation.

The Principal Investigator from IHMC for the workshop was Senior Research Scientist Dr. Jeff Phillips, an aviation human factors expert.

The panels included astronauts Ken Cameron and Bill Shepherd, who spoke at length about the spatial disorientation they experienced in space.

The workshop is one of at least a dozen professional workshops, panels and conferences that IHMC will host in 2023. Such gatherings reflect IHMC's place in the scientific community — and serve as a draw to highlight the Pensacola

area to researchers, scientists, and experts from across the globe.

The group has met twice before, once in 1994 and again in 2019. The first meeting led to the publication of the book "Spatial Disorientation in Aviation," one of the most comprehensive references on the topic. This year's meeting will result in the publication of a second volume, intended to facilitate future work in this essential research area.

Pilots often have difficulty maintaining aircraft orientation by sight or feel alone due to a mismatch between humans' perceptual ability and the conditions of flight, Phillips noted.

"In flight, pilots experience visual and vestibular illusions and gravitational forces not encountered in the natural habitat that humans evolved to thrive in," Phillips said. "In space, there is no gravity to stimulate the vestibular organs that humans rely on to perceive their orientation and position in order to maintain balance and control of direction and movements."

Solutions to mitigate the occurrence of spatial disorientation related issues have been slow to materialize due to the broad range of perceptual illusions mixed with situational factors that can elicit the phenomenon.

"There are literally hundreds of specific scenarios that each must be understood and modeled independently, and no one solution will serve to adequately mitigate spatial disorientation across the space and aviation industry," Phillips said.

Significant safety improvements will require substantial and consistent investment in research and development to gain a more comprehensive understanding of spatial disorientation in aviation and ways to adequately mitigate the risk. ✧



In March 2023, IHMC hosted a meeting of the Spatial Orientation Modeling Experts workgroup to share best practices to counter the effects of spatial disorientation in aviation.

Triumph Gulf Coast funding supports IHMC purchase of cutting-edge gene sequencing device

IHMC is purchasing a new NovaSeq X Plus genetic sequencing device that will help elevate the Institute's footprint as a regional hub of excellence in human performance research.

IHMC will be among the first labs in the country to have the newest version of this device, which allows for next-generation sequencing capacity to

resilience, and ultimately human performance."


The ability to conduct sequencing analysis of both RNA and DNA is foundational in biomedical sciences, however, the tools to perform this analysis typically are found at major biotechnology research hubs or in private industry locations.

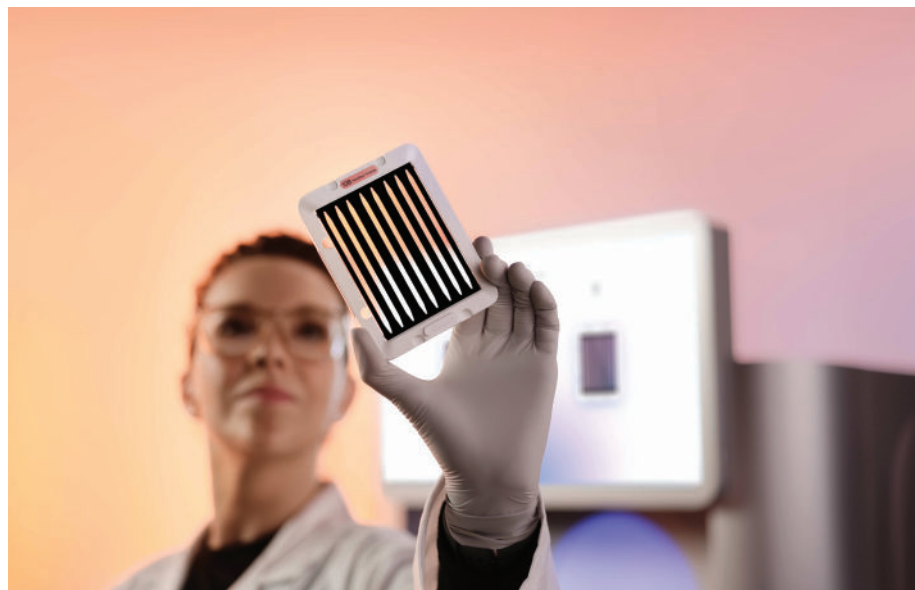
Ryan Tilley, IHMC's director of strategic program execution and innovation, said the \$1.5 million purchase is supported by funding from Triumph Gulf Coast, a nonprofit corporation created to manage the funds from the settlement of the BP Deepwater Horizon 2010 oil spill disaster.

"Triumph's mission is to use the proceeds of the BP settlement to support projects that provide a transformational impact to workforce and entrepreneurial efforts, as well as expanding and diversifying the economy of our region," Tilley said.

Creating a biotechnology and human performance research hub in Northwest Florida has profound benefits not only to the economic health of the region, but also to the intellectual capital that can be nurtured and expanded here because of those investments.

"We are proud that Triumph sees IHMC as a leader in this effort, and we are grateful for their support," Tilley said.

Illumina, the company that developed the device, delivered the first of these sequencers to the Broad Institute at Massachusetts Institute of Technology and Harvard University earlier in 2023. 



The Illumina NovaSeq X gene sequencing device is industry-leading technology.

better understand genetics, genomics, epigenetics, and transcriptomics.

"The information contained in our genes and how they are activated and regulated is extremely important in understanding risks of disease, along with differences between individuals and the responses of each person to a treatment or exposure to stress," says Dr. Marcos Bamman, senior research scientist and director of healthspan, resilience, and performance research at IHMC. "Scientific advances resulting from such a capability are truly game-changing because the information gained will help us optimize approaches to healthspan,

"With IHMC being among the first institutions to acquire the device, we will not only be among the leaders in the field, we also will be in a position to offer this advanced tool in collaboration with other scientific partners," Bamman says.

The ability to conduct this level of research in-house will reduce IHMC's dependency on other labs and the associated subcontracting of funding.

"This places IHMC in much higher demand for collaboration on future funded research programs," said founder and CEO Ken Ford. "We are all very excited to receive this new device and begin tapping into its capabilities."



Illumina's NovaSeq X genetic sequencer

Bayou Texar project recruited residents to participate in water quality, wildlife monitoring

Florida Institute for Human and Machine Cognition (IHMC) research also includes small-scale local efforts.

One such example is work by IHMC Research Scientist David Fries, who is using Bayou Texar as a test bed for a project to enlist residents in tracking the bayou's health. It is a timely project that complements ongoing efforts to improve the waterway, which includes a nearly \$6 million grant announced by the City of Pensacola in November 2022.

With two grants totaling \$100,000 from the Pensacola & Perdido Bays Estuary Program Community Grant Program, Fries launched a citizen science initiative with six monitoring stations linking augmented- and virtual-reality technologies with the real-world bayou. The effort aims to build a living map of the health of one of Pensacola's signature urban waterways.

"The goal is to enable a water management information system generated by the people working with machines to better understand nature and to monitor and effect a change in the waterway," Fries said.

Fries recruited homeowners to attach data collection devices to their docks and property lines. Those devices feed into



Data collection devices like these are part of the Smart Waterways project.

software to analyze the data collected, which includes:

- Photos and social sharing for citizens to share photos of wildlife and water conditions, and to query experts about what they've seen.
- Measurements made by citizens to track the health of the water.
- Access to a data-rich online community that includes GIS mapping data, water quality data, and a place to share personal stories about the impact of the bayou.

Matt Posner, executive director of the Pensacola & Perdido Bays Estuary Program, said the capabilities this initiative offers made a compelling case to the grant committee.

"The committee really liked that it was looking to pilot a new frontier of how we collect water quality data and how we report it to the community," Posner said. "The more you can get citizens engaged in science and the more they take ownership of the issues and opportunities in our estuaries, the better we can address these issues."

Fries says he hopes the effort successfully taps into the love people have for the bayou and gives them a chance to channel that into action to help keep what they love beautiful and healthy.

Posner looks forward to being able to continue the collaboration, with the hope to roll out the system more widely across local and regional waterways.



Bayou Texar, seen from the 12th Avenue bridge, is a signature urban waterway in Pensacola.



The Smart Waterways project helps track water quality and health metrics for Bayou Texar.

Dr. James Allen named fellow by Association of Computational Linguistics

Dr. James Allen, associate director and senior research scientist at Florida Institute for Human and Machine Cognition (IHMC) has earned another accolade in his long and distinguished career in natural language understanding and research.

In December 2022, Allen was named a fellow by the Association for Computational Linguistics (ACL). He was one of eight leaders in the field to be so recognized by ACL, a leading professional organization in the study of computational language processing, a field Allen has helped pioneer.

The nominating committee recognized Allen, who is also a professor emeritus at the University of Rochester where he has been on the faculty since 1978, “for significant contributions to natural language dialogue research, planning, and plan recognition.”

Allen’s research concerns defining computational models of intelligent collaborative and conversational agents that can interact effectively with humans in a wide range of problem-solving and analysis tasks.

His research is unique in that it combines what often are treated as separate fields in artificial intelligence. Those fields include knowledge representation and reasoning, language understanding, planning, intention recognition, and learning. Allen’s system is a high-performance generic collaborative agent that can rapidly adapt to new problem-solving domains.

Computational linguistics is the science 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.



James Allen

Allen joined IHMC in 2006. Since earning his Ph.D. in computer science in 1979 from the University of Toronto and receiving the Presidential Young Investigator award from the National Science Foundation in 1984, Allen has built an international reputation as a leader in AI and collaborative human-machine interaction.

In 2020, Allen was named an AAAS Fellow by the American Association for the Advancement of Science. Each year the association elects members whose efforts to advance science and its applications are considered distinguished

and scientifically valid. AAAS specifically cited Allen for his “broad contributions to artificial intelligence and natural-language understanding, including seminal contributions in temporal logic.”

Dr. Ken Ford, IHMC’s chief executive officer and founder, said that the accolade bestowed upon Allen is another well-deserved honor Allen has earned.

“James has long been an intellectual leader in the field of artificial intelligence,” Ford said. “That ACL has recognized him, rightly, for his pioneering work make all of us at IHMC extremely happy for him.”

Allen has authored numerous research papers in natural language understanding, knowledge representation and reasoning, and spoken dialogue systems. His paper, “Maintaining Knowledge About Temporal Intervals” (CACM, 1983), is regularly included in lists of the most-cited papers in computer science.

He is the author of several books, including the influential textbook *Natural Language Understanding*, published by Benjamin Cummings in 1987, with a second edition published in 1995. ✧



IHMC Research Scientist Choh Man Teng and James Allen

IHMC wins Best Paper Award at International Conference on Humanoid Robots

The robotics team at the Florida Institute for Human and Machine Cognition (IHMC) was lauded at one of the premier conferences in their field.

The team of Duncan Calvert, Bhavyansh Mishra, Stephen McCrory, Sylvain Bertrand, Robert Griffin, and Jerry Pratt won the Best Paper Award at the International Conference on Humanoid Robots 2022 conference in November in Okinawa, Japan.

The conference is sponsored by the Institute of Electrical and Electronics Engineers' (IEEE) Robotics and Automation Society. The paper is titled "A Fast, Autonomous, Bipedal Walking Behavior Over Rapid Regions."

The publication highlights a newly constructed behavior control system for achieving fast, autonomous, bipedal walking, without pauses or deliberation. The control system uses a recently published rapid planar regions perception algorithm, a height map-based body path planner, an A* footprint planner, and a momentum-based walking controller to improve the humanoid's performance over uneven terrain.



Research Associate Duncan Calvert

Walking over flat terrain is something humanoids are adept at across the industry. The behavior control system IHMC's team developed dramatically improves the robot's ability to smoothly

"We are incredibly happy with our result and are honored by its positive reception," Calvert said.

Of note: The last three times the IHMC robotics team has submitted a paper to



IHMC's robotics team earned Best Paper accolades at conference in late 2022.

traverse rough terrain such as broken concrete and cinder blocks.

"Humanoid robots have a very difficult time traversing anything other than perfectly flat ground. They also have a hard time doing anything by themselves," said Duncan Calvert, IHMC research associate. "We're addressing both of those issues in this latest work, which is built on a simple idea: look at the ground, take a step, and repeat. It turns out to be not so simple to implement, which is why researchers have been working on this problem for decades."

Calvert said the team made several improvements to the current state of the art and demonstrated it on Nadia, IHMC's newest humanoid robot. The improvements allow Nadia to walk alone without pauses over a pile of cinder blocks and other debris.

the conference — 2016, 2019, and now 2022 — they have received the Best Paper Award.

"It's a huge honor to be recognized with this prestigious award," said Research Scientist Dr. Robert Griffin, who leads the IHMC robotics team. "It's an enormous amount of work from many people to generate this type of result that includes the entire robot pipeline, from hardware to perception to locomotion. To have our contributions acknowledged by our colleagues in such a way, many of whom are doing incredible work themselves, is fantastic."

Calvert said there will be several improvements for the reliability and performance of this algorithm that they will be tackling over the next few years.

"It's a really exciting time for our lab," Calvert said. 🚀

IHMC’s community outreach supports a vibrant community, fosters love of science in youth

Community engagement in the name of science education is a big part of Florida Institute for Human and Machine Cognition’s (IHMC) mission.

Science Saturdays continue to be a primary avenue for reaching school-aged science enthusiasts. Each session in the 2022-2023 season hosted about 100 students. The students gain many benefits from the experience, but IHMC staffers who lead those sessions see some upside as well.

Research Associate Nicole Esposito taught a session on 3D printing as part of this season of Science Saturday.

“Exploring the ways they understand these topics is just as enlightening for me as it is for them,” Esposito said. “It is always fascinating to see how well they reason through certain puzzles and challenges and comes to inventive and intelligent solutions.”

In Ocala, IHMC’s connection with Marion County schools deepened not only through Science Saturday sessions that included roller coasters and animal adaptations, but also through school visits that allowed scientists to interact with students in small groups.

Dr. Gwen Bryan was part of a contingent on those school visits. She also participated in STEM Story at Pensacola State College. STEM Story is a Pensacola nonprofit that encourages young women to enter STEM fields. Bryan spoke to approximately 80 girls ages 9 to 14. Other guest speakers at that event included women from the military, NASA, cybersecurity, mathematics, and other science disciplines.

Creating more opportunities for girls to pursue scientific careers is important to Bryan, who values mentoring.

“I am really passionate about encouraging young women to consider



Research Associate Nicole Esposito led a recent Science Saturday session on 3D Printing.

STEM careers, so this was a fantastic opportunity,” Bryan said.

Robotics Open House

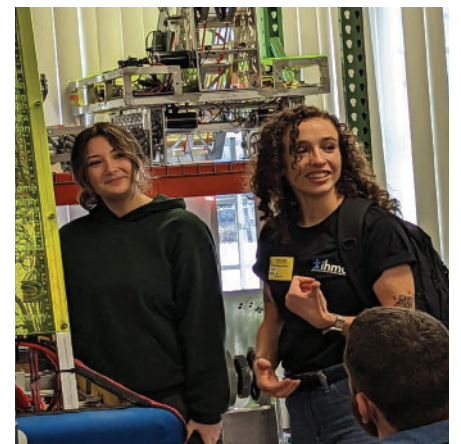
In April 2023, the Pensacola community got a peek behind the curtain at Robotics Open House, an event hosted during National Robotics Week.

More than 350 people came through IHMC's doors for the first such community celebration since 2019. The family-friendly event allowed researchers from all the Institute’s core disciplines to share what they do.

Visitors got hands-on experience with researchers showcasing their work



Dr. Gwen Bryan participated in outreach at Pensacola State College.



Dr. Gwen Bryan visited an Ocala school.

in robotics, virtual reality, human performance research projects, data visualization, and more. The MESS Hall, Pensacola’s hands-on science, technology, engineering, and math museum, also was on hand with exhibits.

“To show our support for the community who has supported us so much in the past, we want to highlight all the technology that has been developed right here in Pensacola,” said Dr. Robert Griffin, the research scientist at IHMC who leads the robotics group.

Robotics Summer Camp coming

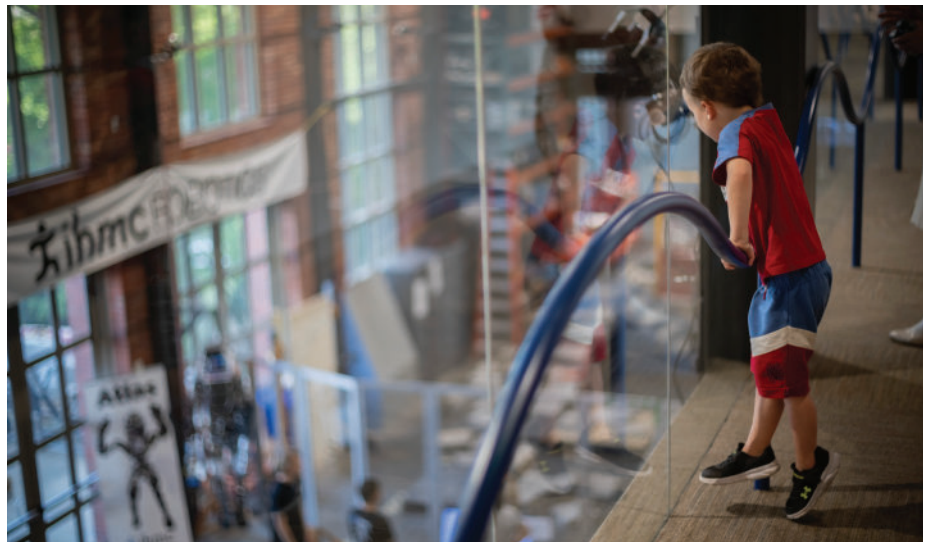
Next up is Summer Robotics Camp in both Pensacola and Ocala, where students in middle and high school will get to work with and learn from IHMC scientists and researchers.

“Robotics Camp is a tremendous asset to our community,” said Dr. Ursulka Schwuttke, director of educational outreach at IHMC. “Educational outreach is a cornerstone of IHMC’s mission and vision, and something that we thoroughly enjoy providing to students both in Ocala and Pensacola.”

“The impact that opportunities like Science Saturday and Robotics Camp can have on the students who participate can be profound,” Schwuttke said.



Dr. Matt Johnson spoke with students during IHMC Robotics Open House.



IHMC’s Open House was part of the celebration of National Robotics Week.



Students enjoyed Robotics Open House.

As part of her Robotics Camp experience in 2018, Tess Brown was on a tour of the robotics lab when she saw the team testing the exoskeleton. That helped fuel a dream that one day, Tess might build her own exoskeleton.

As a student in the International Baccalaureate program at Pensacola High School, she graduates this year (2023). She plans to attend Purdue University to major in first-year engineering, with the hope to transition to biomedical

engineering in her second year. Tess built on the opportunities she had at Robotics Camp, interning at IHMC, working in the robotics lab, and finding mentors who helped nurture that spark in Tess.

She also became a volunteer at Robotics Camp herself, paying back the patience and care that volunteers showed her during her time as a camper.

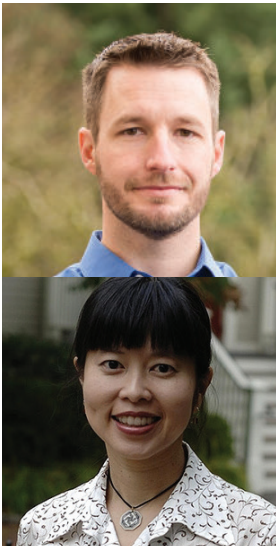
“The volunteers made me look forward to being a volunteer myself when I got older,” Tess said. ✨

IHMC STEM-Talk

From the glymphatic system to innovative exoskeletons to the science of understanding how obesity influences metabolic diseases, and even the likelihood of life elsewhere in the universe, STEM-Talk guests have shared it with listeners.

STEM-Talk hosts Dr. Ken Ford, IHMC's CEO and founder, and Dawn Kernagis, research scientist, have conversations with some of the most fascinating scientific minds. With approximately 4 million total show listens over 151 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. JEFF ILIFF, EPISODE 141

Dr. Jeff Iliff talks about the glymphatic system's role in brain health. Iliff is a professor of psychiatry and behavioral sciences at the University of Washington and a co-leader for research at Washington's Alzheimer's Disease Research Center. Much of Iliff's research today explores how the glymphatic system fails in the aging brain and in younger brains following traumatic injury. He and Dawn talk about their project researching ways to optimize glymphatic clearance for people with acute or chronic sleep deprivation.



DR. VYVYANE LOH, EPISODE 142

Dr. Vyvyane Loh has built her career dealing with metabolic disease and its creeping presence in society. She is the founder and leader of Transform Alliance for Health, which specializes in the treatment of diabetes, hypertension, and dyslipidemia and other chronic metabolic diseases. "Most people assume my patients could be identified visually in terms of their obesity, but it turns out that a good number of my patients have this phenotype of looking thin, but they still have a metabolic problem...they have dysfunctional fat in their bodies."



DR. BEN BIKMAN, EPISODE 143

Dr. Ben Bikman is the author of "Why We Get Sick," a book that takes a deep dive into insulin resistance and metabolic health. In this episode, he discusses his extensive research that links many of today's major diseases – cancer, diabetes, and Alzheimer's disease – to insulin resistance. As more people struggle with hypertension, obesity, fatty liver, dementia, low testosterone, menstrual irregularities, infertility and other disorders, Bikman identifies insulin resistance as one of the root causes behind all of these.



DR. JASON FUNG, EPISODE 144

Dr. Jason Fung is the author of a trilogy of books that examine the root causes of insulin resistance and its impact on health. Fung is the author of "The Obesity Code," "The Diabetes Code," and "The Cancer Code." The Toronto-based nephrologist gained international attention for combining a low-carb diet with intermittent fasting to help thousands of overweight patients reverse their type 2 diabetes and improve their metabolic health. He says realizing that diabetes is a dietary disease changed his medical practice.



ASK ME ANYTHING, EPISODE 145

In this episode, Dawn asks Ken questions submitted by listeners. Listener questions include: whether AI is becoming sentient; how women in midlife might protect their bodies from the negative effects of a slowing metabolism; a Stanford study that compared a low-carbohydrate diet with a Mediterranean diet; whether fasting helps optimize cognitive performance; the future of hypersonic technology; the effects of a ketogenic diet on the liver; and more. The episode closes with Ken sharing some of his pet peeves.



DR. DAN PARDI, EPISODE 146

In this episode, co-hosted by Ken and IHMC Senior Research Scientist Dr. Marcos Bamman, Dr. Dan Pardi talks about the concept of “actual health,” health performance experts, and a shift in what aging means, which he believes is important to improving the quality of life for all of us. Pardi, a well-known sleep researcher, is the CEO of humanOS.me, a digital health training application that includes at its core “The Loop Model” a behavioral psychology-based model, he developed during his Ph.D. studies.



DR. GWEN BRYAN, EPISODE 147

Dr. Gwen Bryan is a research scientist at IHMC who leads the exoskeleton team in the robotics lab. In this episode, she talks with Ken and Dawn about the exoskeleton team’s work developing a novel augmentative device for people with spinal cord injury and a powered exoskeleton to aid workers at nuclear site remediation. The episode also explores some of the innovations Bryan was part of during her doctoral studies at Stanford University, and what is ahead for IHMC’s robotics research team.



DR. ED WEILER, EPISODE 148

Ed Weiler wanted to be among NASA’s first scientist astronauts. In the end, he wasn’t chosen, but fortunately, he went on to a 33-year career, including 20 years at NASA as chief scientist for the Hubble Space Telescope. The episode covers Ed’s time at NASA, his commitment to education and outreach through projects like Hubble and James Webb, and his belief that in the next 20 to 50 years, we will be able to prove the existence of other life in the universe.



DR. JEFF VOLEK, EPISODE 149

Dr. Jeff Volek has been investigating how humans adapt to ketogenic and carbohydrate-restricted diets for 30 years. On his return to STEM-Talk, Jeff talks about a growing accumulation of studies supporting a ketogenic diet to improve metabolic health, as well as research confirming the relative safety of dietary fat. Two of Jeff’s recent papers – one in Science, the other in the Journal of the American College of Cardiology – furthermore “debunk the dogma that saturated fats should be limited because they cause obesity.”



DR. BARBARA THORNE, EPISODE 150

Termite biologist Dr. Barbara Thorne is an expert on the invasive conehead species, a Central and South American termite that has invaded South Florida and requires immense efforts to contain and eradicate. Since 2012, she has served as the Florida Department of Agriculture and Consumer Services science advisor on the state’s Conehead Termite Program. Barbara is a research professor and professor emerita in the Department of Entomology at the University of Maryland.



DR. JOHN IOANNIDIS, EPISODE 151

Dr. John Ioannidis of Stanford University spoke about his extensive research into the COVID-19 pandemic. He discussed the criticism he faced in 2020 for questioning the World Health Organization’s prediction of a 3.4 percent fatality rate associated with COVID-19, which turned out to be incorrect. John also shared the results of his recent peer-reviewed paper that looked at the fatality rate of COVID-19 in the non-elderly population. The paper finds that the fatality rate may have been as low as 0.03 percent in people under 60.

In 2023, Evening Lecture series tackles geroscience, robotics, back pain, exploration of Mars, Titan, and beyond

For 20 years, IHMC has used the Evening Lecture series to invite thought leaders, experts, raconteurs, and researchers from nearly every scientific discipline to share their wisdom. It has become one of IHMC's signature public outreach efforts, bringing the community together for fascinating conversations. Here is a look at our 2023 lectures. Visit our website, www.ihmc.us/life/evening_lectures to stay updated on upcoming lectures.



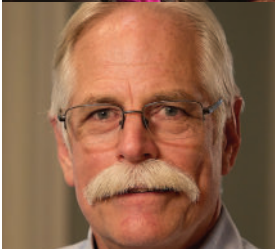
DR. ALEXANDER FLEMING

People are living longer, but also are suffering with multiple chronic diseases – and the exploding cost of managing those conditions – in the final and least productive years of life. In the first lecture of 2023, Dr. Alexander Fleming talked about efforts to understand how we can extend our productive, healthy years. He also touched on geroscience, a discipline focused on the biological roots causes of aging and disease, that ultimately could reduce the financial and societal burden of unhealthy aging.



DR. KAREN WOOLEY

Dr. Karen Wooley is looking to the insect world in part for the next iteration of sustainable, biodegradable plastics. Wooley, the W. T. Doherty-Welch Chair in Chemistry and University Distinguished Professor at Texas A&M University, spoke in February as part of the Smart Lecture series. She shared the latest efforts to support the commercial translation of carbohydrate-derived degradable plastics to harvest of building blocks from insect feedstocks. The goal is not just improving sustainability, but digestibility should the product end up in an animal or human.



DR. STUART MCGILL

Back pain changes over the course of a lifetime. The key to managing it is to make adaptations appropriate for each stage of life. Over the past 45 years Dr. Stuart McGill has probed the questions of how the spine changes over time and what improves its resilience. In his March lecture, Stuart recapped a career spent exploring back pain mechanisms, rehabilitation and performance training. He also shared a plan to boost resilience and performance as we age.



DR. DOMINIC D'AGOSTINO

Dr. Dominic D'Agostino is a Visiting Senior Research Scientist at IHMC and an Associate Professor in the Department of Molecular Pharmacology and Physiology at the University of South Florida Morsani College of Medicine. His laboratory develops and tests metabolic therapies for CNS oxygen toxicity (seizures), epilepsy, neurodegenerative diseases, and brain and metastatic cancer. The focus of his lab over the last five years has been understanding the anticonvulsant and neuroprotective mechanism of the ketogenic diet and ketone esters.



TONY BARR

For many, the computer world is opaque. In his May 2023 Evening Lecture, Tony Barr aims to lift that veil. Barr is working on a new computing theory – A Model of Reality (AMOR) inspired by the work of IHMC's Joseph Novak. AMOR unifies philosophy, linguistics, algebra, logic, and computer science. Barr has a master's degree in physics from North Carolina State University. His career began at IBM, and since he has been a founder in four companies: Barr-Mullin, Inc., SAS Institute, Inc., Barr Systems, Inc., and A Model of Reality, Inc.



DR. GWEN BRYAN

Dr. Gwen Bryan is a Research Scientist at IHMC focused on powered exoskeletons. She investigates lower-limb wearable robotic devices aimed at augmenting human performance in clinical, occupational, and military applications. These devices can augment user performance to increase human capabilities or rehabilitate individuals with limited mobility or chronic injuries. In her talk, Gwen shared an update on the work going on at IHMC in this field, leveraging the Institute's internationally recognized expertise in the fields of both Robotics and Human Performance.



DR. STEVE ANTON

Dr. Steve Anton's February lecture focused on "Lifestyle Approaches for Cellular Health." Steve is a leading authority on intermittent fasting and Chief of the Clinical Research Division at the University of Florida's Department of Aging and Geriatric Research. He has conducted many studies on intermittent fasting and won awards for his work. His lecture covered some key lifestyle changes that recent research has found can improve cellular health and ultimately promote healthy aging. In 2018, he was a past guest on IHMC's podcast, STEM-Talk.



DR. TOM JONES

Dr. Tom Jones knows more about the possibilities for humanity's future in space than most. In more than 11 years with NASA, he flew on four space shuttle missions, and in 2001, he led three spacewalks to install the centerpiece of the International Space Station, the American Destiny Laboratory. He spent 53 days working and living in space. The March lecture by the veteran astronaut, scientist, author, and pilot focused on the technology and commercial breakthroughs that will open space to more scientific exploration, tourism, and business activity on the Moon, asteroids, and Mars.



DR. MORGAN CABLE

NASA's quest in exploration of the solar system is to "follow the water" and find all three ingredients for life as we know it - water, chemistry, and energy. Could life exist in the oceans of Enceladus or Europa? Could even stranger life have emerged in the liquid methane lakes of Titan? Dr. Morgan Cable will cover our current state of knowledge of these ocean worlds, and discuss some current missions and future mission concepts to explore their plumes, surfaces, and ocean depths.



DR. DAN PARDI

Dr. Dan Pardi delivered an Evening Lecture in Pensacola in 2022 and was a guest on Episode 146 of STEM-Talk, IHMC's podcast. He is the CEO of humanOS.me – a digital health training application. Pardi has a Ph.D. in cognitive neuroscience from Leiden University in the Netherlands, and Stanford University in the United States, and he has a master's degree in exercise physiology from Florida State University.

IHMC welcomes new senior research scientists

The Institute for Human & Machine Cognition has built a home excellence in all of our disciplines. IHMC is re-thinking the relationship between humans and machines, defining new directions in human-centered computing by linking cutting-edge research into a new alliance of artificial intelligence, linguistics, psychology, robotics, philosophy, engineering, and social and educational studies. From robotic walkers to conceptual education, from aircraft cockpit design to new agent architectures to natural language communication, IHMC research programs are exploring ways to enable humans and computers to work together. Our work is exciting and our standards are high. We are thrilled to welcome these new members to the team.



KEVIN GLUCK, SENIOR RESEARCH SCIENTIST

Kevin joined IHMC as a Senior Research Scientist in March 2023. He will take a leadership role in building a basic and applied research program in computational cognitive sciences, will be a contributing faculty member to the Joint UWF-IHMC Intelligent Systems and Robotics Ph.D. program, and will play a prominent role in fostering collaborations in these areas with government, industry, and academia.

Kevin earned a bachelor's degree in cognitive psychology from Trinity University, and he earned both a master's and a Ph.D. at Carnegie Mellon University, also in cognitive psychology. While in graduate school at CMU, he was awarded a training fellowship from the Air Force Research Laboratory, marking the start of his tenure as a civilian scientist with AFRL.

Over the subsequent 24 years, he collaborated with an assortment of government, industry, and academic colleagues on research topics ranging across spatial processing, fatigue effects on cognitive function, robust decision making, personalized learning, and human-machine teaming.

In 2010-2011 he held a visiting scientist position at the Max Planck Institute for Human Development in Berlin, Germany. In addition to his work as a government scientist, Kevin also has nearly four years of private sector research and development experience.

Kevin has authored more than 100 peer-reviewed publications, is an inventor on two U.S. patents, and had a lead role in the organization and management of 14 international conferences and workshops. He is a Fellow of the Psychonomic Society and served as Chair of the Governing Board for the Cognitive Science Society.

When not working, Kevin's priority is spending time with family and friends. He especially enjoys outdoor activities like biking, hiking, snowboarding, and traveling to new places. Kevin's wife, Julie, is an artist, and together they have two wonderful children, Ashtyn and Liam. They look forward to getting to know Pensacola and all it has to offer.



VLADIMIR V. TSUKRUK, SENIOR RESEARCH SCIENTIST

Vlad is a Senior Research Scientist at IHMC and Regents Professor at Georgia Institute of Technology, where he is the director of the Microanalysis Center at the School of Materials Science and Engineering.

His research in the field of functional nanomaterials, surfaces and interfaces, directed assembly of synthetic/natural polymers, nanostructures, and bioinspired materials has been recognized by the Fulbright Award, Regents Professorship, Sigma Chi Sustained Research Award, Outstanding Research Author Award, Humboldt Research Award, and the National Science Foundation Special Creativity Award, among others.

He is an elected Fellow of American Physical Society, Materials Research Society, and the American Chemical Society, and a Fulbright Fellow.

He earned a master's degree in physics from the National University of Ukraine, and Ph.D. and DSc degrees in chemistry and polymer science from the National Academy of Sciences of Ukraine. He carried out post-doctoral research at the University of Marburg, TU Darmstadt and University of Akron.

He has co-authored about 540 refereed articles in archival journals, which have been cited more than 38,000 times and two books. He has organized 13 professional meetings and has trained about 110 graduate students and post-docs. Currently, he serves on the editorial advisory boards of six professional journals and as an executive editor at ACS Applied Materials and Interfaces.

IHMC welcomes new research scientists



GEOFF CLARK, RESEARCH SCIENTIST

Geoff joined IHMC as a Research Scientist in May 2023, working with Dr. Robert Griffin and other members of his team. He previously worked at the Interactive Robotics Lab at Arizona State University. His research focused on building data pipelines to connect inertial, force, and vision data to machine learning models for fast inference and control.

His work also created adaptable policies with reinforcement learning on simulated legged robots with domain randomization for sim-to-real transfer.

Geoff is pursuing his Ph.D. at Arizona State University, where he also earned his master's degree in electrical engineering and bachelor's degree in robotics engineering.

He also served as a mentor for robotics and machine learning for Desert Women in Autonomous Vehicle Engineering (WAVE). He earned a Dean's Fellowship and an Arizona Graduate Scholar Award at Arizona State.

In his free time, he enjoys playing piano, photography, motorcycle repair, woodworking, and dogs.



CARLOS MASTALLI, RESEARCH SCIENTIST

Carlos joined IHMC as a Research Scientist in April 2023. His appointment allows him to collaborate with the robotics team and other IHMC scientists. His research focuses on the intersection of model predictive control and machine learning for motor control in legged robots.

His Ph.D. research was completed on "Planning and Execution of Dynamic Whole-Body Locomotion on Challenging Terrain" in April 2017 in the Dynamic Legged System lab at Istituto Italiano di Tecnologia. He contributed to planning, perception, and control framework for legged locomotion on challenging terrain. His career has included fruitful time in different European research institutions: IIT (Genova), ETH Zurich, LAAS-CNRS, The University of Edinburgh and The Alan Turing Institute.

He focuses on the problem of loco-manipulation tasks since it combines the main challenges in robot mobility. His research combines the formalism of model-base approach with the exploration of robot data.



KONSTANTINOS MITSOPOULOS, RESEARCH SCIENTIST

Konstantinos joined IHMC as a Research Scientist in November 2022. He will be collaborating with Dr. Peter Pirolli, among others. His research aims to better understand the psychological and cognitive factors that influence human decision-making in order to identify patterns and trends that can inform the design of new machine learning algorithms and models.

He earned a bachelor's degree in physics at the University of Athens; a master's degree in machine learning at University College in London; and a Ph.D. in computational neuroscience at Birkbeck College in the UK.

Prior to joining IHMC, Konstantinos worked as a Project Scientist at the Robotics Institute at Carnegie Mellon University, where he focused on developing autonomous agents that can efficiently and effectively collaborate with humans to accomplish tasks with shared goals. Previously, he served as a postdoctoral researcher at the psychology department at Carnegie Mellon University, where he worked on numerous projects at the intersection of cognitive science and machine learning.

Outside of work, Konstantinos is an avid volleyball player with many years of experience competing in multiple countries. He has a passion for Latin dances and enjoys learning and practicing various styles such as salsa, bachata, and kizomba.

IHMC welcomes new senior research associates



KANA MEECE, SENIOR RESEARCH ASSOCIATE

Kana joined IHMC as a Senior Research Associate in November 2022 and works with Dr. Marcos Bamman and Dr. Morley Stone on human performance projects.

Prior to joining IHMC, Kana was a senior staff associate at Columbia University Medical Center in New York City. Her previous published research was in melanocortin neuropeptide systems, which plays a key role in regulating appetite and body weight and is an important target for leptin and insulin in the hypothalamus. To study the regulatory role of proopiomelanocortin (POMC) and its derived peptides, her studies used a transgenic and knockout mouse model under dietary restriction and high fat diet setting in responses to changes in body weight/composition and glucose and fat metabolism.

Her research focus includes POMC peptide processing mechanism in response to energy balance. Mutations in POMC, POMC-processing enzymes, and melanocortin receptors have all been associated with obesity in humans and have many similarities to rodent models of melanocortin deficiency, making these studies highly relevant to energy balance in humans.

She has a bachelor's degree in child psychology from Kyoto Women's University, and bachelor's and master's degrees in biology from the University of West Florida.



FRANCESCO TASSI, SENIOR RESEARCH ASSOCIATE

Francesco joined IHMC as a Senior Research Associate in May 2023 to work with Dr. Robert Griffin and the robotics team. He completed his Ph.D. in robotics engineering at Politecnico di Milano, where he also earned a master's degree in mechanical engineering. His academic Ph.D. is held in collaboration with the Italian Institute of Technology (IIT) in Genoa, Italy, where he is part of the Human-Robot Interfaces and Physical Interaction (HRII) (iit.it/hrii) laboratory, under the ADVanced Robotics (ADVR) division.

He previously worked as a Research Fellow at the Italian National Research Council in Milan, and as a visiting student at the Jet Propulsion Laboratory (JPL), California, where worked on motion planning and Model Predictive Control of a multi-scale swarm of multiple robots.

Francesco has specialized in optimal control techniques, teleoperation, and motion planning of redundant mobile manipulators. In particular, he focused on hierarchical low-level whole-body control for redundant robots and Hierarchical Quadratic Programming (HQP) for Human-Robot Collaboration (HRC).

He joined the IHMC team because he is deeply fascinated by the team's work and achievements with humanoid robots.

IHMC welcomes new research associates



ALESSANDRO AMATO, RESEARCH ASSOCIATE

Alessandro joined IHMC in November 2022 as a Research Associate after previously serving as an intern. He joins the team working with Dr. Niranjana Suri and his team on the ARL Intelligent Systems project. Alessandro was a student at both the University of West Florida and the University of Ferrara through the schools' international partnership program. His hobbies include video games and spending time outside.



LANDON CASEY, RESEARCH ASSOCIATE

Landon joined IHMC in October 2022 as a research associate working with scientists on human performance research projects.

Before joining IHMC, Landon graduated from Mississippi State University with a degree in computer engineering. During college, he became involved in the Center for Entrepreneurship and Outreach in the MSU college of business and found a love for entrepreneurship.

Post college, Landon worked part time running a prototype and product design company, helping inventors, entrepreneurs, and other small businesses create tangible prototypes of their products and ideas. He hopes to use his product development skills at IHMC to bring projects to life.



CODY CASTELLO, RESEARCH ASSOCIATE

Cody joined IHMC as a Research Associate in March 2023 working with Dr. Robert Griffin and other members of the robotics team, a role that he believes will offer fantastic learning opportunities.

Cody has a background in time-critical electronics systems maintenance and management including comprehensive hands-on and academic expertise in complex troubleshooting, maintenance, repair, and training/supervision of team members. He has always tried to work with new and exciting technology, and IHMC offered a great fit as a place to explore robotics.

Cody was a member of the U.S. Marine Corps with the 8th Communications Battalion, Camp Lejeune NC (26th MEU). He currently is studying Technical Management at Embry-Riddle Aeronautical University.

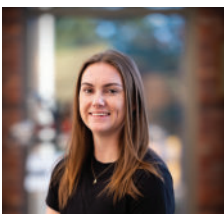


AMRITPAL KAUR, RESEARCH ASSOCIATE

Amritpal joined IHMC in November working with Dr. Marcos Bamman and his team on a variety of projects.

She earned a bachelor's degree in nutrition and dietetics, master's degree in food and nutrition science from Punjab Agricultural University, and a master's degree in nutritional science from Oklahoma State University. Previously she worked at the Oklahoma Medical Research Foundation in Oklahoma City.

She lives in Pace with her husband, Hardeep and her daughter, Nivaz. During her free time, she enjoys spending time with family and friends, and cooking.



RACHEL WRIGHT, RESEARCH ASSOCIATE

Rachel joined the IHMC team in November 2022 working with Dr. Marcos Bamman and the Human Healthspan, Resilience, and Performance team on a variety of projects.

She is a science enthusiast and a Pensacola native who graduated with a bachelor's degree from the University of West Florida in biomedical sciences. Throughout her college career, Rachel was a centerfielder for the UWF Women's Softball Team.

Outside of work, Rachel enjoys quality time with her friends and anything outdoors.



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