



FLORIDA INSTITUTE FOR HUMAN & MACHINE COGNITION

ihmc

VOLUME 4 ISSUE 1

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Dear Friends of IHMC,

It is becoming clear that the strength of America's economy in the future will be a function of how well it prepares to compete in the marketplace of ideas and innovation. As this new economy takes shape, Florida – and IHMC – will have an increasingly important role to play in making certain the US remains a competitive force.



As a number of pundits have noted recently, a collection of related developments and trends are rapidly leveling the global economic playing field. Nations such as China and India are no longer content with the low-wage manufacturing that characterized their economies since the end of the Second World War, but instead they have set their sights squarely on the high-paying, high-skill jobs of the future. The implications for the United States are serious, but the choices are simple: we must either innovate or stagnate. If the United States does not continue to be a world leader in research and innovation, we will lose our competitive advantage and our standard of living will surely decline.

The good news is that our elected leaders get it. Florida's own Governor Jeb Bush is a case in point. Governor Bush understands that research and innovation are the key to a healthy economy in the future. Creativity and innovation are the critical value-added factor in today's economy. Legislation passed by the Florida Legislature dedicates in excess of \$300 million in surplus tax revenue to help Florida grow its "Innovation Economy." Just as IHMC is a fertile habitat for innovation and a fabulous investment for Florida — this legislation will provide the basis for other success stories around the state.

Americans have consistently led the world in innovation and have a history of meeting every major challenge thrown in their path. Let's hope these trends continue, assuring the nation's future economic and strategic well-being will more than ever depend on our ability to innovate.

Best Wishes,

Kenneth M. Ford, Director

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Autonomy Architectures



“Plans are nothing. Planning is everything.”

—DWIGHT D. EISENHOWER

When a fire breaks out, firefighters need to know about it as soon as possible to limit the damage. Early incident awareness is equally important for police responding to crimes, soldiers responding to incursions, and scientists trying to observe rare terrestrial and astronomical events. Ideally, they would monitor all possible incident locations all of the time. But the ideal is often unachievable in practice. Though rapid advances in technologies such as unmanned aerial

vehicles (UAVs) make it possible to monitor more effectively than ever, people typically have limited assets to observe with and must carefully plan how best to use them.

Experts know a lot about what has to be considered to make a good plan. A firefighter, for example, might consider the presence of fire-hazards at a site, its proximity to residences, and any prior history of fires. Creating a surveillance plan that correctly takes such factors into account

is extremely difficult for people. Even if they create a good plan, it has to be carried out in the real world where unpredictable changes, such as in the weather, require frequent reexamination and revision of the original plan.

IHMC's Michael Freed and his team have developed Apex, a software system allowing robots such as UAVs to create plans and carry them out autonomously. Users then act in a supervisory role, expressing mission goals and priorities based on their extensive knowledge and then monitoring

mission progress, intervening as often or infrequently as they wish.

Apex is an autonomy architecture, an organizing framework and set of functional building blocks for systems that need to behave intelligently in demanding task environments. Plans in Apex are much like those a person makes for a road trip. With a goal or destination in mind and perhaps a few places we would like to stop at along the way, we get out a map and plan the trip. But we shouldn't be too surprised if our best-laid

“A goal without a plan is just a wish.”

—ANTOINE DE SAINT-EXUPERY

SCIENTIST PROFILE

Michael Freed



Hometown: Longmeadow, Massachusetts

Education: B.S., Computer Science, University of Massachusetts; Ph.D., Computer Science, Northwestern University

Joined IHMC: 2003

Michael considers himself a rather serious person. However, he likes games and improvisation, not following a set plan. His life plan had been to become a lawyer or, more specifically, a judge. He knew a little about computers, though, so the summer before college he got a job as a Fortran programmer. In his free time he started trying to write a program for playing Hearts.

That introduction to the idea of artificial intelligence led Michael to join an AI lab in college in hopes of improving his game. During his second year, he was offered an internship in the Justice Department on the same day as the professor in the AI lab asked him to work in the lab for the summer. He decided that day that the likelihood of becoming a Supreme Court justice was slim, but this AI stuff seemed pretty interesting. All for the want of a good Hearts game.

Games and his love of

improvisation continue to influence his life. When playing a computer war game a few years ago, Michael realized how hard it was to keep tabs on the ground situation and that Apex, a tool he began developing in graduate school, could help overcome the challenge. Now this periodic surveillance problem is one of the major thrusts of his research. Michael also knows the value of improvisation in many situations and made sure Apex has the flexibility to handle changing situations.

Michael always admired the work of Pat Hayes. When Ken Ford was a director at NASA's Ames Research Center, where Michael was working, Michael learned Ken was from IHMC. He asked Ken if he knew Pat, and from there a strong relationship developed. Michael enjoys being part of IHMC; it's like being a member of an exclusive club where he has the opportunity to interact with some of the leaders in artificial intelligence and other related fields.

Michael still enjoys games when he has time. Though he isn't a big baseball fan, he took up Fantasy Baseball around the time his son was born, thinking it was a good hobby for a new dad. He also likes to travel, both for work and pleasure. In addition, he and his wife, a computational chemist, keep busy with their two young kids. Their son started kindergarten this year, and they are getting involved with the PTA. At the first meeting when someone asked if there was anyone with expertise in writing grants, Michael and his wife knew they found their role and would keep quite busy with this new challenge.

plans go astray. Pouring rain at a planned scenic stop may cause us to reconsider getting out of the car. If the rain slows our progress, we might speed up at the end to make up for lost time or skip another stop. The original plan didn't specify driving speed, lane of travel, or where to stop to refuel, so we figure these out as we go. Apex handles unpredictability in a similar way, first by distinguishing what needs to be planned in advance from what can be improvised, and then by constantly reexamining and revising the plan as it is executed.

UAV missions are similar. During the UAV mission the wind can change, delaying the plane's arrival at a destination. The sun will have shifted in the sky, so the photo will need to be taken at a different angle. Perhaps there are obstructions to the original viewing angle.

In collaboration with the Army and NASA, Freed and his team have used Apex to develop an approach to autonomy for airborne surveillance that is effective in unpredictable, real-world environments. Apex creates a plan that it can change in response to the changing environment. In addition, Apex is amenable to human intervention. If the operator monitoring the mission notices

something strange, he may want to send the plane back to take more photos. After the operator relinquishes control, Apex will reexamine the mission plan to adjust to the new situation. The operator may even get new information that completely changes the goals of the mission, and Apex will revise the plan completely.

One of the overarching goals of the Apex project is to lower barriers to the creation of intelligent software agents. Much effort goes into reducing the time, expertise, and inventiveness required to build and maintain applications. Freed and colleagues designed Apex to be broadly applicable, serving as a platform for a wide range of intelligent system applications. This type of reusable platform is beneficial for projects that need autonomy technology but where the developers lack the expertise or budget to develop it for themselves.

The Apex system contains more than just a set of algorithms for generating intelligent behavior, such as the path planning algorithm used for UAV surveillance. Other system components address practical problems in building, validating and gaining acceptance for autonomy applications. For instance, a frequent challenge for autonomy applications is making



the internal (reasoning) behavior of the system transparent. It cannot be just a black box, or else developers won't be able to identify and fix problems, and stakeholders won't be able to understand the system well enough to trust it. To provide this transparency and assist in integrating Apex into different applications, Apex contains a simulation framework for early prototyping and Sherpa, a collection of visualization tools for validating and debugging autonomy applications.

To support reuse of Apex in diverse applications, Freed has placed a strong emphasis on making the system usable, including simple interfaces with other programs and ample documentation. He has distributed this program to nearly 200 other users in government, academia, and industry. Working with them he has improved the program, adding and improving many features.

Several groups have used Apex not to control robots but to simulate humans. Apex treats humans and robots the same way – as intelligent behaving entities with certain sensing resources, manipulators, memory capacity and so on. By using Apex in their simulations, these groups can predict how well real people will perform when interacting with complex automation such as autopilot systems.

As with planning UAV missions, simulating humans first requires specification of high-level goals. For instance, if the system is a new ATM machine, the modeler must describe goals such as withdrawing money and retrieving balance information. The modeler next defines methods for reaching these goals, such as entering a PIN, choosing the withdraw button, and entering amount to be withdrawn. Apex also requires infor-

mation about how people perform basic behaviors such as eye movements and button pushing. Here the Apex system can save the modeler time as it has a number of these behaviors already encoded.

Once the goals and methods are described, Apex can create a plan specifying the exact sequence and timing of actions needed to achieve the goals. The system considers the different resources available and can stagger the completion of individual tasks based on resource availability, allowing some tasks to be performed in parallel. The resulting plan is a prediction of how people would really carry out the task. These predictions have been proven very accurate and sometimes very helpful in guiding the design of real systems.

Recently, Freed has moved another step forward in creating a broadly usable autonomy system: NASA has just released the Apex source code under its Open Source Agreement. The hope is that Apex will benefit from the distributed, open-source development model used successfully in so many other projects. Individuals other than those on the Apex development team will be able to contribute new, distinctive reasoning and control capabilities and refine old ones, improving the system for future users.



■ ■ ■ **One of the overarching goals of the Apex project is to lower barriers to the creation of intelligent software agents.** ■ ■ ■

RECENT LECTURES

■ ■ ■ IHMC's Evening Lecture Series



Dr. John M. Poindexter

Poindexter Addresses National Security Needs

Dr. John M. Poindexter described how the US intelligence apparatus operates and detailed some recent research aimed at improving the system during his lecture "Improving the National Security Process" on February 21st. While serving as the National Security Advisor under President Ronald Reagan, Poindexter learned first hand and in detail how the system works.

During his lecture Poindexter explained how information flows within the national intelligence framework, with a particular focus on the distinct steps

that are generally grouped as analysis but which actually comprise several steps. He highlighted how many of the same steps are carried out in a large range of departments throughout the government.

Information technology is crucial to national security, according to Poindexter.

With multiple groups working with similar, though distinct, data, sharing this data would improve security. However, it is critical to avoid infringing on the security of the data. Poindexter urged the creation of the Total Information Awareness (TIA) program at the Defense Advanced Research Projects Agency (DARPA) to improve data sharing.

The TIA program emphasizes the formation of a distributed, collaborative, information sharing environment while still allowing competitive analysis. One major accomplishment of the TIA program was a network of agencies, people, tools, and data that is designed to test new concepts and technologies. The TIA program was shut down after only 18 months due to what Poindexter considers misrepresentation of privacy concerns.

No longer with DARPA, Poindexter currently is a

private consultant and serves on the Board of Directors of Saffron Technology, an innovative computer software company that produces associative memory applications.

Prior to joining DARPA, Poindexter served as Senior Vice President for SYNTEK Technologies, a small, high-technology firm, where he worked with DARPA on Project Genoa, a program for analyzing large amounts of data.

Poindexter served as National Security Advisor and Deputy National Security Advisor for President Reagan from 1983 to 1986 and as Military Assistant in the White House prior to that. Poindexter also served 29 years active duty in the U.S. Navy, rising to the rank of Vice Admiral. While in the U.S. Navy, he specialized in training, new tactics and battle management procedures, and pioneering uses of shipboard computers.

Poindexter holds doctoral and master's degrees in physics from the California Institute of Technology. He received his bachelor's degree in engineering from the U.S. Naval Academy.

■ ■ ■ While serving as the National Security Advisor under President Ronald Reagan, Poindexter learned first hand and in detail how the national security system works. ■ ■ ■

RECENT LECTURES

■ ■ ■ IHMC's Afternoon Lecture Series

Pat Hayes discusses innovative computer interface ideas

The basic design of today's user interface was created over 30 years ago and has not changed in its essentials since. IHMC's Dr. Pat Hayes initiated a discussion on the design of a new interface during his lecture "Beyond the Desktop." Rather than the current system, with distinct files and applications, he proposed a novel computer-as-workshop interface. His preliminary ideas led to a discussion that explored challenges and advantages of such a system.

Sergey Drakunov outlines approach to nonlinear observers

To simplify the analysis of systems, they are often assumed to be linear. Such assumptions often lead to inaccuracies. In his lecture "Dynamic Observers," Dr. Sergey Drakunov, Associate Professor at the Department of Electrical Engineering and Computer Science, Tulane University, outlined a theory of nonlinear observers. He also explored how results from nonlinear observers based on differential equations may provide hints for designing observers for other types of models.

Lucian Galescu examines statistical analysis of medication names

Confusion between drug names, due to similar pronunciation or spelling,

can have a direct and serious health consequence to a patient. In his lecture "Medication Errors: Will Statistical Pronunciation Models Help?" IHMC's Dr. Lucian Galescu presented ideas on how to use techniques previously developed for speech recognition and speech synthesis to improve name choice. In addition he described other ways that speech and dialogue technology could assist healthcare providers.

David Hall describes data fusion system

Analysis of remote sensor data currently requires teams of human analysts. Dr. David Hall, Associate Director of the Penn State Applied Research Laboratory, described techniques for improved understanding and retrieval of multi-sensor data during his lecture "Crossing the Longest Yard: Comments on Challenges and Opportunities for Level-5 Multi-sensor Data Fusion." His new concepts will assist analysts in many areas using techniques including game methods and cognitive aids.

Raj Pandian summarizes work on underwater vehicle manipulators

Autonomous underwater vehicles (AUVs) are often restricted to surveying and reconnaissance by their lack of manipulators. Dr. Raj Pandian, Assistant Professor in the Department of Electrical Engineering and Computer Science, Tulane University,

described his work on improving the control of manipulator systems to allow underwater intervention during his lecture "Intelligent Control of Autonomous Underwater Vehicle-Manipulator Systems." His systems utilize neuro-fuzzy control methods to provide precise control.

Paul Groth describes novel provenance system

Tracing the history and methodology of analyses is critical in science and business. This history, known as provenance, is harder to retain with computer analysis. Dr. Paul Groth, a postdoctoral researcher at the School of Electronics and Computer Science, University of Southampton, UK, examined a new provenance system during his lecture "What Happened? Using Provenance for Compliance and Verification." In particular, he demonstrated an application of this system to bioinformatics.

Gregory Wheeler examines computational logics

Formal logic forms the basis for computational systems. In his lecture "Remarks on Some Sub-P Logics," Dr. Gregory Wheeler, a postdoc and associate member of the Center for Research in Artificial Intelligence (CENTRIA) at the New University of Lisbon, Portugal, detailed his recent work on understanding properties of a core relational logic, System P. Wheeler examined several alternate systems that

lack some properties that are essential to defining consequence relations.

Michael Grace outlines research on snake IR sensing

Man-made IR detectors, like those in night-vision goggles, are quite rudimentary compared to those of snakes. Dr. Michael Grace, Associate Professor of Biological Sciences at Florida Institute of Technology, described his research into snake IR detectors during his lecture "Infrared Imaging in Pit Vipers and Pythons: From Biology to Technology?" He detailed several facets of the snake IR system and the complex interdependence of the snake visual and IR systems.

Donna Byron details dialog agent

Conversation is a complex interchange, particularly tracking the participants' knowledge and the context of the dialog. During her lecture "Context Management for Embodied Conversational Agents," Dr. Donna Byron, Assistant Professor in the Department of Computer Science and Engineering at Ohio State University, described the OCEANS conversational agent for search and rescue. Her lecture focused on the reasoning component and sensor fusion needed to support context-sensitive language processing in this dialog agent.

From January to March 2006, IHMC was awarded over \$2.4 million for research

FUNDING

NEW FUNDING AWARDED TO IHMC FROM JANUARY THROUGH MARCH 2006



Conéctate

PI: Dr. Alberto Cañas
Amount Awarded: \$700,000
Source: Panama

The “Conéctate al Conocimiento” Project being carried out by the Secretary for Governmental Innovation of Panama together with the Ministry of Education aims to transform the public educational system through innovative learning strategies, supported by state of the art computer and communications technology. To achieve its ambitious educational objectives, Conéctate requires a computer-based learning environment that is tailored to the schools and enables students and teachers to perform to the best of their potential. IHMC is collaborating with the Secretary for Governmental Innovation of Panama to develop and implement

part of the technical infrastructure capabilities needed for the success of the project. This infrastructure will build on IHMC’s CmapTools to create a network of computers for the school system that contains personal spaces for individual users. In addition, IHMC researchers will augment the CmapTools with modules designed for lower-elementary children.

Work System Design and Evaluation

PI: Dr. William Clancey
Amount Awarded: \$494,491
Source: NASA Ames

Human-centered computing amplifies human capabilities by taking into account how people think, behave, and interact in everyday settings. Dr. Clancey will

continue his work with NASA-Ames Research Center as project leader for Work System Design and Evaluation. This effort will use both empirical field studies and formal modeling of work systems as design tools for inventing new ways of doing space operations. Clancey will focus on tools for simulating daily operations for NASA missions, such as a Mars habitat or robots working with people on the moon. These human-centered systems will facilitate knowledge creation, communication, and collaboration between astronauts, remote scientists, and engineers, making work and everyday life in harsh environments safer and more efficient.

Agile Computing for AF Information Management Infrastructures

PI: Mr. Niranjan Suri
Amount Awarded: \$421,303
Source: AFRL

Operational and tactical military environments are composed of mobile nodes and dynamic situations. Agile computing provides a method for opportunistically discovering, manipulating, and exploiting available computation and communication resources in order to improve capability, performance, efficiency, fault tolerance, and survivability. This grant will support leveraging and extending the agile computing approach and metaphor to improve Air Force information management infrastructures for dynamic and tactical environments. In particular, work will focus on dynamic service instantiation, relocation, optimization, and discovery, as well as proactive service link maintenance and efficient data dissemination.

Rapid COI Infospaces Creation and Deployment using KAoS and Cmaps

PI: Dr. Jeff Bradshaw
Amount Awarded: \$197,855
Source: AFRL

Current information management infrastructures lack methodologies and software mechanisms to support Communities of Interest (COIs) in exploration, implementation, and operational use. To ease the creation and maintenance of COIs, IHMC researchers will design a generic ontology for COIs that can be edited using CmapTools. IHMC’s KAoS policy mechanisms will be extended to provide policy specification and enforcement of COI member activities, exploit COI ontologies, and integrate COIs with the Joint Battlespace Infosphere. CmapTools functionalities will be integrated with KAoS to allow management of COI resources using CmapTools.

Issues in Maintaining Scientific Integrity in Applications of Automated Methodology

PI: Dr. Clark Glymour
Amount Awarded: \$145,000
Source: NSF

Every scientist must rely to some extent on their own judgment during data analysis. In some cases, they intentionally skew the data. In others, they make errors in determining the best analysis methods. This grant will fund an in-depth exploration of cases in a variety of fields, from mineralogy to microbiology to lead poisoning, where lapses in judgment led to incorrect conclusions. A thorough understanding of these lapses is

FUNDING

NEW FUNDING AWARDED TO IHMC FROM JANUARY THROUGH MARCH 2006

critical as we move more toward automated analysis of data, where many standard checks are no longer possible.

The Effects of Culture and Society on Adversarial Attitudes and Behaviors

PI: Dr. Paul Feltoich
Amount Awarded: \$120,000
Source: Air Force Office of Scientific Research

Understanding the enemy is beneficial in preparing defensive or offensive strategies. Under this grant, IHMC researchers will design and develop a computational model of adversary (enemy) attitudes and behaviors that correctly accounts for social, cultural, and political factors. In particular, techniques such as inter-group conflict modeling and social decision making will be integrated into computational models. Individual adversaries will be probabilistically modeled, and coordination and competition among adversaries will be regulated through policies.

Early Alzheimer's Automated Screening Test

PI: Dr. Anil Raj
Amount Awarded: \$95,000
Source: Byrd Institute

Early identification of the onset of Alzheimer's disease would aid in treatment but is currently unavailable. IHMC researchers will use this funding to begin the development of a test for evaluation of early symptoms of Alzheimer's disease. By using real-time cognitive state assessment and multi-agent integration architectures, researchers will create an automated screening test that

detects subtle cognitive function decrements, allowing for earlier detection of the onset of Alzheimer's. The test will employ the IHMC Adaptive Multi-agent Integration (AMI) Architecture, which enables intercommunication of data from disparate, heterogeneous elements such as psychophysiological measures, multi-sensory displays, and performance tests.

Novel Glaucoma Diagnostics for Structure and Function

PI: Dr. David Danks
Amount Awarded: \$89,631
Source: NIH

As with many diseases early diagnosis and treatment of glaucoma leads to better health outcomes. A multidisciplinary team led by researchers at the University of Pittsburgh is developing technologies for precisely measuring optic nerve and retinal changes that will enable early detection of glaucoma and of glaucoma progression. IHMC's David Danks will collaborate with this team in statistical analysis. In particular, he will apply several machine learning techniques to the detection of glaucoma using optical coherence tomography.

Joint Battlespace Infosphere Software Development Support

PI: Dr. Jeff Bradshaw
Amount Awarded: \$50,000
Source: AFRL

The Joint Battlespace Infosphere manages the fast pace of information going to and from the battlefield. IHMC is working with other organizations in the development of the next generation JBI

architecture. This architecture will include IHMC's KAoS system for semantically rich policy and domain management, and our agile computing infrastructure for increasing the reliability and efficiency of the system in tactical operations. Under this grant IHMC researchers will assist in the development of prototypes for incorporation into these systems.

Interoperable Knowledge Representation for Intelligence Support (IKRIS) Workshop

PI: Dr. Pat Hayes
Amount Awarded: \$50,000
Source: Advanced Research and Development Agency

A useful, common form of knowledge representation must be created for knowledge dissemination. The IKRIS workshop brought together experts to address the interoperability of knowledge representation technology and the practical representation of knowledge that is relevant to intelligence analysis tasks. This grant will fund the reporting of the results from the workshop. The results will include designs of representations, automated reasoning methods for knowledge expressed in the representations, prototype implementations of the designs and methods, and use case demonstrations.

Knowledge Elicitation for SPY-1 Radar Maintenance

PI: Dr. Robert Hoffman
Amount Awarded: \$39,900
Source: Naval Personnel Development Command

One of the strengths of concept

mapping is its power as a knowledge elicitation tool. Through this project, IHMC researchers will demonstrate the strength of using this tool to elicit and represent the knowledge and reasoning of experts who maintain SPY-1 Radar. While eliciting their knowledge, the researchers will document procedural specifications to ease future use of these tools in knowledge elicitation. In addition, they will determine areas in which to expand and extend the knowledge elicitation, representation, and re-use capabilities of IHMC's CmapTools.

Toolkit for Role-aware Exchange of Knowledge

PI: Dr. Robert Hoffman
Amount Awarded: \$20,000
Source: AFRL

Real-time collaboration often involves fluid, dynamic assignment of responsibilities and roles within a community of users. However, existing collaborative software does not permit changing roles by the user. The Toolkit for Role-aware Exchange of Knowledge (TREK) under development by Charles River Analytics will support the development of collaborative, real-time, role-based information-sharing systems. IHMC researchers will assist in knowledge modeling and knowledge elicitation to help design the most effective system. In addition, these funds will support the integration of human-centered visualization and collaborative human-machine interaction into the system interface.

PEOPLE IN THE NEWS

NEWS AT IHMC



Dr. Akshay Desai



Dick Baker



Carol Carlan

IHMC welcomes two new members to its Board of Directors.

Dr. Akshay Desai is the President of American Family & Geriatric Care, President, CEO and Chairman of Universal Health Care, President of American Managed Care, LLC, and President of Courtesy Healthcare.

Dr. Desai was appointed to the Florida Board of Governors in 2005 by Governor Jeb Bush. The Board of Governors sets policy and oversees the management of the Florida university system. He has also served as Chairman of the Florida Council for Education Policy, Research and Improvement and chairs the Health Committee of the White House Commission on Asian Americans and Pacific Islanders.

Dr. Desai currently resides in St. Petersburg, Florida, with his wife and three children.

Mr. Richard "Dick" Baker is involved full time in residential subdivision development in Escambia and Santa Rosa Counties. He previously was a mortgage banker. A leader in the Pensacola business community, Mr. Baker serves as treasurer of the Pensacola Chamber of Commerce and serves on the boards of Sacred Heart Hospital, TEAM Santa Rosa, Gulf Coast Community Bank, and the Homebuilder's Association of Northwest Florida. He is a former trustee of Pensacola Junior College and the former President of the UWF Foundation.

Dick has won the Pensacola Chamber of Commerce PACE Community Leader of the Year award and previously served on the IHMC Advisory Board. Dick resides in Gulf Breeze with his wife Laverne.

IHMC Board Chair honored with two business awards

Ms. Carol Carlan, two-term Chair of the IHMC Board of Directors, received two awards for her leadership in the Pensacola Business Community. The first award, the Pensacola News Journal Business Journal, Woman Business Leader of the Year award, was presented in January 2006. The second award, the Pensacola Chamber of Commerce Pensacola Area Commitment to Excellence (PACE) Business Leader of the Year award was presented in February 2006.

Both of these awards honor Carol's commitment to her business, her extensive service in the community, and her mentorship of future leaders. Carol is Wachovia West Panhandle Market President and is responsible for the bank's operations in Escambia, Santa Rosa, and Walton Counties. This past year, Carol oversaw the region's merger of SouthTrust Bank's operations with Wachovia. As the first female president of a

large regional bank in the area, she has used her position to bring positive change to our community.

Carol is active in many community organizations but is most proud of her activities in the areas of education and children. She currently is on the Pensacola Junior College Board of Trustees (and served as two-term Chair), the PACE Center for Girls State Board of Trustees, the Advisory Board for the University of West Florida School of Business, and a board member and founder of the PACE Center for Girls Escambia/Santa Rosa (and past President).

Carol also serves as 2005-2006 Chair of the United Way of Escambia County, Board Member and Audit Chair for Sacred Heart Health Systems. Past President and Board Member Emeritus of the Pensacola Junior College Foundation, and a Bay Area Chamber of Commerce Board Member.

Other distinguished awards and honors Carol has received include: Phi Kappa Phi Honor Society Community Leader of the Year, University of West Florida; Pace Center for Girls Guardian Angel Award; Spirit of Women Award, Sacred Heart Hospital; Women of Distinction Award, Girl Scouts of Northwest Florida; Diamond Award, Women's Business Center of Northwest Florida.

A resident of Escambia County, Carol resides in Pensacola with her husband Charles Carlan and their dog, Champ.



HAPPENINGS

HONORS AND EVENTS AT IHMC

IHMC receives IT award

IHMC won the 2005 ITFlorida Excellence in IT Leadership - Northwest Florida award. The award was created by ITFlorida to recognize outstanding businesses "for exceptional leadership in furthering the use of information technology to successfully advance economic, social, or

simulations of the Vecna Bear robot. The Bear is designed to evacuate casualties from the battlefield. It uses hydraulic arms to scoop up soldiers and is highly maneuverable, able to go up and down stairs and through narrow openings. The simulation, along with a prototype robot, was recently featured in "Military Machines-Warbots" on the Discovery Military Channel.

The show included profiles of a range of military robots, including combatbots, spybots, supportbots, and medbots. Combatbots include a number of currently deployed machines, including unmanned ground and aerial vehicles with attached weaponry. Spybots, too, are widely used and include aerial surveillance drones and ground vehicles to inspect for explosives. Supportbots are autonomous robots that can resupply troops in the fields. The US military is aiming for one third of supply efforts to be autonomous by 2015.

During the show, several challenges to the emerging field of medbots



Vecna Bear



ITFlorida Award

technical development in Florida." The award cited the importance of IHMC's efforts toward human-centered computing in extending human capabilities. ITFlorida is an umbrella organization of both public and private technology leaders for Florida. They provide guidance to the state, particularly the governor, legislature, and Enterprise Florida, on technology issues. In addition, they work to ensure the successful integration of technology infrastructure statewide. Niranjani Suri accepted the award for IHMC at the Award Gala Dinner at the Disney Contemporary Resort in Orlando, Florida.

IHMC simulations featured on Discovery Channel

IHMC researchers collaborated with colleagues at Vecna to create



Reception at Pensacola Museum of Art

were highlighted, particularly the fact that robots have no bedside manner.

The Vecna Bear is designed to resemble a person in some respects to improve trust. In addition, it will be useful in a variety of tasks, such as loading a truck, thus increasing the likelihood of it being nearby to retrieve an injured soldier. As research advances, we soon may no longer need to send a medic into an extremely dangerous situation to assist a fallen comrade.

IHMC hosts Scientific Advisory Council Meeting

IHMC's Scientific Advisory Council was established to provide broad oversight of IHMC's research direction and to suggest new opportunities for growth. The inaugural meeting of the Council, held February 16th and 17th, gave the members an overview of the range of research currently underway and allowed them an opportunity to meet in small groups with the researchers.

The Council was welcomed by IHMC Director Ken Ford, who outlined the mission of IHMC and a number of ongoing projects. Dr. Anil Raj described his work on sensory

augmentation, and Dr. Jerry Pratt presented current research on biologically inspired robotics. During lunch, Associate Director Dr. Alberto Cañas discussed the work with CmapTools.

Research on natural language processing and collaborative human-machine interaction was detailed by Dr. James Allen, and Dr. Bill Clancey described efforts in work system design. In addition, Dr. Ford, Dr. Allen, and Mr. Niranjani Suri presented their work on process integrated mechanisms.

Following the research briefings, the Council and many researchers met informally during a reception at the Pensacola Museum of Art, which was featuring an exhibit of Picasso ceramics. At the conclusion of the meeting, the Council provided feedback to IHMC on its research and future directions.

Present at this Council meeting were Dr. Julio Escobar, Vice Admiral Al Harms, Dr. Alexander Lewis, Ms. Joann Morgan, Dr. Dwayne McKay, Dr. Bill Mularie, Dr. Alain Rappaport, Mr. William Smart, and Dr. David Waltz. To learn more about the members of the IHMC Scientific Advisory Council, please visit the IHMC website: www.ihmc.us.



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