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FLORIDA INSTITUTE FOR HUMAN & MACHINE COGNITION

VOLUME 8 ISSUE 1

Dear Friends,

Many of you are aware of IHMC's strong community outreach, both in creating a unique adult lecture series and in promoting hands-on science opportunities for youth.

Intertwined throughout all aspects of IHMC's research mission is education. While the educational role of a research institute is traditionally construed as training undergraduate and graduate students in scientific research — the dissemination of CmapTools software into thousands of educational settings throughout the world may prove to have an even broader influence. Currently people in over 150 countries use CmapTools, and there are approximately 300 downloads of the software each day. We are excited and proud to see how this work is helping to shape education at all levels both at home and abroad. At the Science and Innovation Week meeting held this year in Mexico City, Dr. Alberto Cañas gave the closing plenary address and discussed the emergence of a global knowledge network and shared his international experience in the use of CMap Tools.

In addition to this newsletter's featured research article depicting our progress in Natural Language Processing, many other reports highlight other aspects of IHMC's diverse research and outreach activities. One article details the recent unveiling of the IHMC prototype exoskeleton Mina and another covers the overwhelming success of the IHMC Robotics Open House held this past April in conjunction with National Robotics week. Our new Ocala research facility has essentially doubled our lecture series and increased the summer internships available at IHMC. We are especially pleased to have a robust summer student intern program, as the labs and hallways seem full of young people and the energy they bring with them.

We hope you enjoy this newsletter and will share with us your feedback on areas that may be of particular interest.

Best Wishes,

Kenneth M. Ford, Director

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40 South Alcaniz Street
Pensacola, Florida 32502
850-202-4462 phone
850-202-4440 fax
www.ihmc.us

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Natural Language Processing

Wigdog, a digital companion that understands spoken language and gathers information

The Information Age has produced a tremendous volume of data—digital records of all kinds—from emails to photos to medical records. Unfortunately, retrieving useful information from these sources is typically a challenge and frequently requires a human to play an active role in determining the context of information.

IHMC researchers are working on developing technologies or algorithms which are better able to extract information from text and spoken language. They are using these systems to develop tools in a variety of areas to better utilize the abundance of available information.

Even with all of our grammar rules, human language, particularly spoken language, is often imprecise. People typically rely on an understanding of the context or personal general knowledge to interpret the meaning of language. Humans are very skilled at understanding what others are saying, but computers need tools to help comprehend what is being said.

During a conversation, two humans often can predict what the other will say, and even if some of the words or syllables are lost, listeners understand the main idea. Many words sound very similar, but listeners can use prediction to determine very rapidly what is said. IHMC's Lucian Galescu is working to translate some of those skills into computers. These word prediction models assist computers in more accurately determining human speech.

Knowing the words is only the first step. In order for computers to

Lucian Galescu works to model speech prediction for voice recognition in computers

PROFILES

■■■ Natural Language Processing Researchers

YORICK WILKS

Hometown: Torquay, England
Education: B.A., M.A., and Ph.D Philosophy, Cambridge University
Joined IHMC: 2010

Yorick's interest in digital companions was sparked by competing for the Loebner prize. The prize was for the best conversational computer, and Yorick's group won the prize in 1997.

He was a Professor of Artificial Intelligence at the University of Sheffield, England, and a Senior Research Fellow at the Oxford Internet Institute at Balliol College. He was also the founding Director of the Institute of Language, Speech, and Hearing at Sheffield University.

His work as the coordinator of the EU conversational assistants project was winding down when he met Ken Ford. He knew other IHMC researchers, including Pat Hayes, James Allen, and Tom Eskridge, and was very impressed with IHMC. So when he had the opportunity to join, he was eager.

He enjoys working in the new building in Ocala, a nice, quiet town, with good food. IHMC has proven to be a wonderful environment where talented people are allowed to do what they do best. He has been involved in politics, singing, and acting, and is looking forward to getting involved in those activities in Ocala.

NATE BLAYLOCK

Hometown: Provo, Utah
Education: B.S. Computer Science, B.A. Linguistics, Brigham Young University, M.S. and Ph.D. Computer Science, University of Rochester
Joined IHMC: 2007

During a mission trip to Japan, Nate began to wonder if he could write a program to conjugate Japanese verbs. Upon his return to college, he took a linguistics course where he learned about the field of natural language processing and became hooked.

During his graduate work, he enjoyed the opportunity to combine his two passions, computer science and linguistics. He was pleased to work with James Allen, also of IHMC, both because of the caliber of his work and also the lab environment.

After graduate school, Nate joined IHMC and has continued collaboration with Allen as well as others at IHMC. He now is a researcher in the IHMC facility in Ocala, which is near many collaborators, including Moffitt Cancer Center. The size of the community also feels right for Nate.

Nate's passion for language led him to become fluent in four languages - English, Japanese, Spanish, and German. His wife is a native Spanish speaker, and their sons are bilingual. Spending time with his family is his main hobby, though he is also very active in his church.

interact seamlessly with humans, they need to understand the intent of the words. Work by IHMC's James Allen focuses on intention recognition, helping the computer understand a spoken statement in context. Then the computer generates a task model to help determine the relationship between what a human says and what the human wants to do. Using this model, the computer can better assist the human in planning and finding alternatives for solving problems. IHMC has used these models to build computer systems that can learn to perform everyday tasks, from natural human instruction, much like humans learn to accomplish tasks by instruction from humans.

■ ■ ■ Using this model, the computer can better assist the human in planning and finding alternatives for solving problems. ■ ■ ■

The complexity of language also makes information extraction difficult. Information extraction is a method of understanding language by deriving information from a surface-level analysis rather than fully parsing text. Most spoken and even written language does not conform well to the rules of grammar, making full parsing a challenge.

However, in many instances, sufficient information can be gleaned from an initial superficial analysis, followed by further parsing of areas

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FEATURED NEWS

James Allen focuses on intention recognition

of interest. The systems must utilize machine learning to adapt to the language presented to understand better the author's intent.

One place where there is an abundance of data is in medical records. Unfortunately, most of our medical history consists of short notes by the physicians. Gathering information from these notes is challenging, which is why physicians typically rely on questionnaires for new patients.

Physician's notes and other medical records, however, are a potential treasure trove for understanding disease. Many longitudinal studies such as the Framingham or Nurse's studies have provided information on causes of common diseases like heart disease. Current efforts to determine medical correlations rely on researchers who have to guess what variables might be of interest. Exploiting the data more broadly, though, would possibly turn up correlations that were not predicted or that might be specific risk factors for a small segment of the population.

Using information extraction techniques, IHMC's Nate Blaylock is partnering with the Moffitt Cancer Center to mine their data to discover additional risk factors as well as to

assess treatment effectiveness. This research will utilize a larger sample size and test for more variables of interest than has traditionally been possible. The results might be utilized to create more personalized medicine for future patients.

During the 2010 earthquake, people all over Haiti sent text messages about the local challenges. A team of volunteers translated the messages, mapped the locations, and planned how the international aid community would prioritize the intervention. IHMC researchers are working to apply information extraction in disaster scenarios like this. Tools under development would be able to determine location by comments in the dialogue and could be used to build a real time map to assist in directing aid during future disasters.

Individuals are relying more and more on computers and other devices for storing critical information, from business documents and communications to phone numbers and photos to medical records. Managing that information, in addition to personal stored information over a lifetime, will soon be too difficult for an individual to handle.

IHMC researcher Yorick Wilks is developing tools to help us manage our increasingly digital lives. These tools are designed as companions, understanding spoken language and gathering personal information over long periods of time. Traditional artificial intelligence

relies on what the user inputs, but these companions can increase their knowledge base through interaction with the internet. The companions will be personal, conversational, and open to world knowledge.

Initial research on companions has focused on the elderly. This population has rich life histories which they are eager to share but often face technological challenges in interacting with the digital world. Additionally, the desire to age at home requires new tools for monitoring health at home. A companion for the elderly could help them better retrieve online information, track appointments, give their family histories of illness, or even show whether or not they understood enough to give informed consent to a medical procedure. They would also be more likely to converse with a companion about how they feel during a day, allowing medical personnel to diagnose illness better.

The information revolution has put more information at our fingertips than we know what to do with. Digital companions and information extraction will help us interact more effectively with the information. Natural language systems will help us improve how we communicate with computers and how they can better understand our requests. The tools IHMC researchers are developing in these fields will allow us to take better advantage of available information.

■ ■ ■ **The tools IHMC researchers are developing in these fields will allow us to take better advantage of available information.** ■ ■ ■

HAPPENINGS

■ ■ ■ NEWS OF IHMC

IHMC Researchers Unveil New Exoskeleton

Research at IHMC has led to the creation of a robotic exoskeleton, named Mina, developed to restore ambulation for individuals afflicted with paraplegia, hemiplegia, paresis, asthenia, and functional muscle loss. Developed by the IHMC robotics team led by Dr. Peter Neuhaus and Dr. Jerry Pratt, Mina acts as a pair of robotic legs that assist people who have lost their ability to walk in regaining upright mobility when outfitted with the device. Future applications of Mina are envisioned to span from rehabilitating those with stroke and spinal cord injuries to augmenting human strength capabilities when operating in complex mobility environments.

Comfortably secured to the individual with leg, waist, and shoulder attachments, Mina utilizes computer-controlled motors at the hips and knees to move the user's legs while the user provides balance with a pair of forearm crutches. Future versions of the device will include advanced user interfaces and untethered operation. Other next-generation versions of Mina are expected to address mobility over varied terrains, as well as application for rehabilitating those with stroke and spinal cord injuries.

Currently in its Phase II prototype form, Mina has been subjected to an extensive array of onsite evaluations. Most recently, operational evaluation involved two individuals with complete spinal cord injury who are unable to walk. Within hours of training with the IHMC team on the use of the Mina, both individuals were able to walk independently with only forearm crutches for support. For both, this was the first experience of walking upright since becoming paralyzed. During testing, one of the paraplegic evaluators commented: "What I want is to be able to reintegrate back into the walking society because we are not rolling creatures. The exoskeleton [Mina] will bring me back to what humans are … we're walking creatures."

Pratt, and IHMC researchers Jerryll Noorden, Travis Craig, Tec Torres, Justin Kirschbaum, David Lecoutre, Ionut Olaru, John Taylor, and Matt Bellman. Mina joins a growing list of technologies and innovations developed by the IHMC robotics team including humanoid robots that can walk, balance, and recover from pushes, reconfigurable dynamically balancing robots, and algorithms for quadrupedal robots that can walk over very rough terrain.

Exoskeleton developed by researchers at IHMC provides mobility to those who cannot walk

The IHMC Mina Exoskeleton has been under development for several years by Peter Neuhaus, Jerry

A video of IHMC's Mina can be viewed at http://www.ihmc.us/research/mina/Mina.php.

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HAPPENINGS

▪ ▪ ▪ NEWS OF IHMC

IHMC, Ocala Location

Ocala Receives LEED Gold Certification

The US Green Building Council awarded IHMC's new Ocala facility LEED Gold certification. The nationally-prized LEED (Leadership in Energy and Environmental Design) award program was developed by the Council to provide building owners with a concise and value-added framework for implementing green building design, construction, operations, and maintenance. As part of their certification process, LEED program representatives assessed the IHMC facility's design and renovation with respect to energy savings, water efficiency, emissions reduction, indoor environmental quality, and stewardship of resources. The IHMC Ocala facility is an adaptive reuse of an old library building in the heart of downtown Ocala. The design specifications required that the building meet the LEED Gold certification requirements. In addition, the downtown facility complements the surrounding architecture and contributes to IHMC's role in the community.

CAÑAS PRESENTS PLENARY LECTURE

IHMC's Alberto Cañas delivered the closing plenary lecture at Science and Innovation Week (SIW) 2010. He spoke on building a global network of knowledge builders, particularly his experience with spreading IHMC CmapTools worldwide. SIW 2010 was held in Mexico City, Mexico, through the cooperation of the Institute of Science and Technology, the Mexican Academy of Sciences, the Scientific and Technologic Consultative Forum, major research institutions and distinguished national and international entrepreneurs. The aims of the conference were to discuss the impact of science, technology and education as essential tools to solve some social problems, build a better city, and create the hub for innovative industries. A broad array of topics were discussed, including healthy cities, sustainable cities, connectivity and technology, and science and technology education, with distinguished speakers addressing each topic.

Among the speakers were 8 Nobel prize winners and 3 "Principe de Asturias Award" winners. Dr. Cañas' talk was part of the "Educated City in Science in Technology" track, and was called "Towards a World Wide Network of Knowledge Constructors".

Dr. Alberto Cañas presents plenary lecture

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HAPPENINGS
NEWS OF IHMC

Rogacki Appointed Associate Director

John "Row" Rogacki is the new associate director, providing oversight and leadership at IHMC's new Ocala facility.

"Dr. Rogacki brings a wealth of experience to IHMC to include senior level administrative and research work with the Air Force, NASA, and Department of Defense," said IHMC CEO and Director Dr. Kenneth Ford. "We are excited that Row has chosen to join our leadership team, and look forward to his many contributions to our institutional success and relationships going forward."

Prior to joining IHMC, Dr. Rogacki served from 2004-2010 as Director of the University of Florida's Research and Engineering Education Facility (REEF), a unique educational facility in Northwest Florida supporting US Air Force research and education needs through graduate degree programs in mechanical, aerospace, electrical, computer, industrial, and systems engineering. Under Dr. Rogacki's leadership, the REEF grew into a highly capable and internationally respected research and education facility.

Other prior experiences include leadership roles with NASA and the US Air Force. He earned his PhD and MS in Mechanical Engineering from the University of Washington, and his BS in Engineering Mechanics from the US Air Force Academy.

Professor Armando Duarte of the University of Illinois addresses a multinational IUTAM audience

IHMC Hosts International Symposium

IHMC welcomed top scientists and mathematicians from around the world as members of the International Union of Theoretical and Applied Mechanics (IUTAM) met from May 17th through 19th in Pensacola for a three-day symposium. The symposium, entitled "Linking Scales in Computations: from Microstructure to Macro-scale Properties," featured researchers from seven different countries and 14 major U.S. universities, as well as several U.S. federal agencies. The symposium was organized by Professor Oana Cazacu of the University of Florida Research and Engineering Education Facility and Dr. John "Row" Rogacki, IHMC Associate Director. A total of seventy-five (75) individuals attended.

IUTAM is an international non-governmental scientific organization belonging to the International Council of Scientific Unions (ICSU), which was founded in 1948 with the objective to form a link between people and organizations engaged in scientific work in mechanics and related fields and to promote the development of mechanics, both theoretical and applied, as a scientific discipline.

IUTAM rotates its symposia among the continents represented by its members, and meetings are held in the U.S. only every seven or eight years. Pensacola was selected as a meeting site due to its history, walkable downtown area and European-style atmosphere. In addition to IHMC, two other U.S. sites were selected for 2011 symposia: Stanford University and the University of Texas at Austin.

HAPPENINGS

◼ ◼ ◼ ◼ NEWS OF IHMC

## IHMC holds 4th Concept Mapping Conference in Chile

The Fourth International Concept Mapping Conference (CMC) followed on the success of the previous three, bringing together educators, researchers, scientists and business leaders from all over the world to Viña del Mar, Chile, from Oct 5-7, 2010. cmc2010 was organized by IHMC and the Universidad de Chile.

IHMC's Dr. Joe Novak (through video-conference) and Dr. Alberto J. Cañas gave the inaugural talk, entitled

The Universality and Ubiquitousness of Concept Maps. This opening session discussed the origins and evolution of the concept mapping as a tool for use in both educational and business settings, as a method of facilitating meaningful learning and knowledge management, and as a means of organizing and navigating through large quantities of information.

The conference continued with three days of presentations and discussions

that showcased the extensive use and flexibility of concept mapping as a multi-dimensional tool in educational, corporate, and government settings, including new reported uses in learning assessments, project propsals, project management, social networking, business applications, and medical records capturing patient history and aftercare instruction. The Fifth Conference, cmc2012, will take place in September 2012 in Malta.

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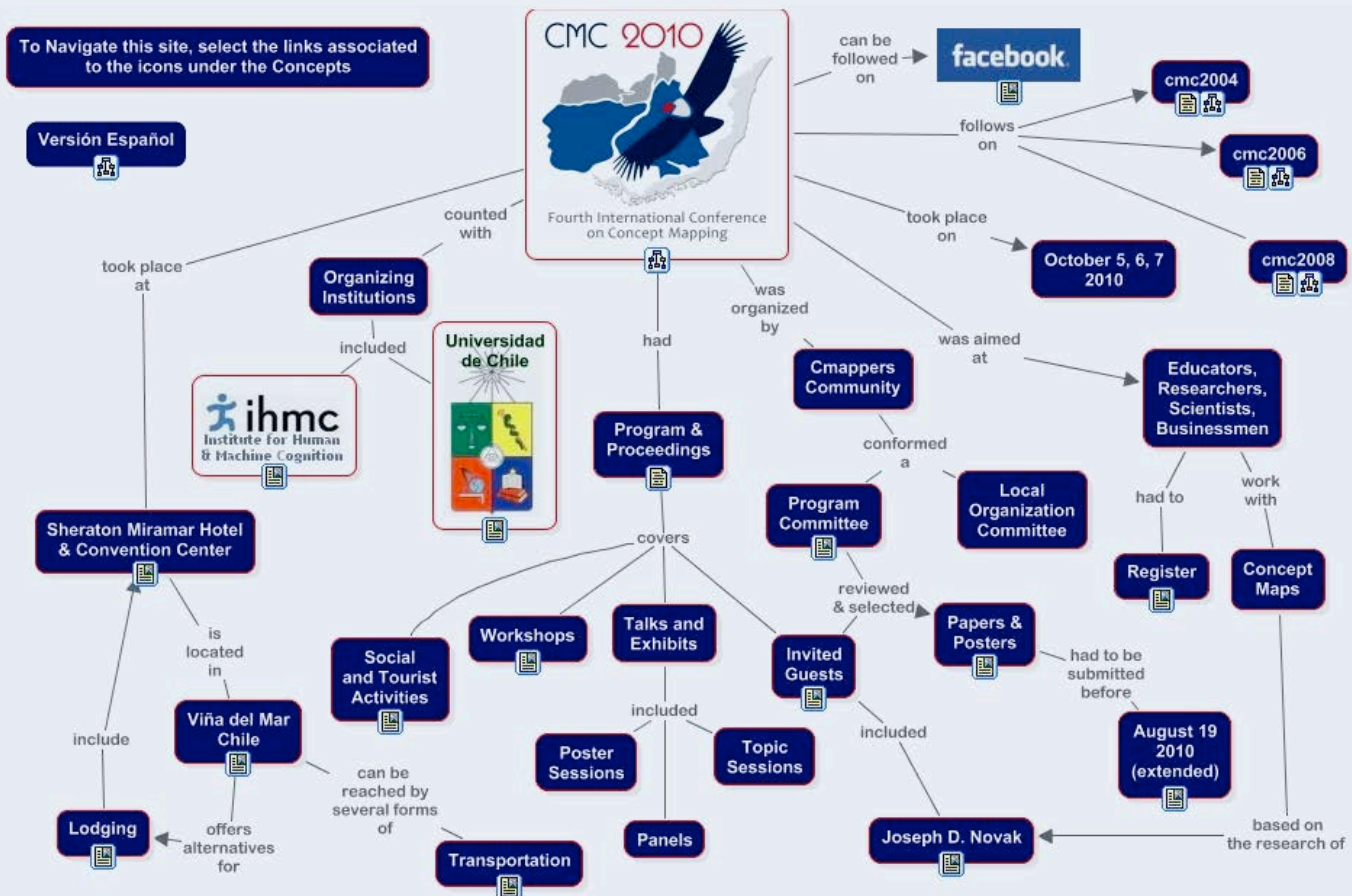
LOCAL NEWS
■ ■ ■ NEWS OF IHMC

IHMC Welcomes Summer Interns

Each year, IHMC hosts a substantial collection of graduate/undergraduate students and early career scientists. U.S. and international students receive an introduction to research experiences while contributing significantly to IHMC's research efforts. Many of the students return for multiple summers and have been hired following graduation.

Matthew Bellman
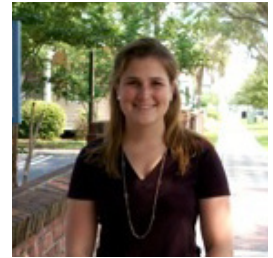University of Florida
Biologically Inspired Robotics

Domenico Castagnaro
U. of Modena and Reggio Emilia
Agile Computing

Jeremy Coffield
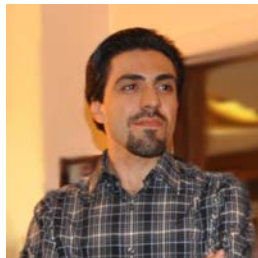University of West Florida
Biologically Inspired Robotics

Daniel Duran
Embry Riddle Aeronautical U.
Biologically Inspired Robotics

Caitlin Greskovich
Amherst College
Sensory Substitution

Stephen McCrory
Massachusetts Institute of Tech.
Biologically Inspired Robots

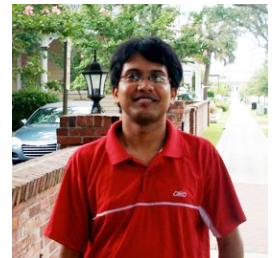**Saeed Moghaddam**
University of Florida
Security and Information Assurance

Andrea Monternari
U. of Modena and Reggio Emilia
Agile Dissemination

Olivier Morere
Ecole Nationale Superior de Cognique
Sensory Substitution

Subrat Nayak
University of Florida
Biologically Inspired Robotics

Gowri Shankar Panneer
University of Florida
Security and Information Assurance

Atal Rawat
University of Florida
Natural Language Processing

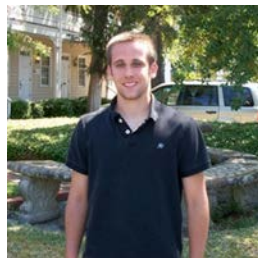**Thomas Rolinger**
University of West Florida
Agile Dissemination

Andrea Rossi
University of Ferrara
Agile Dissemination

Praween Salitra
University of Florida
Security and Information Assurance

Douglas Stephen
University of West Florida
Biologically Inspired Robotics

John Taylor
University of Florida
Biologically Inspired Robotics
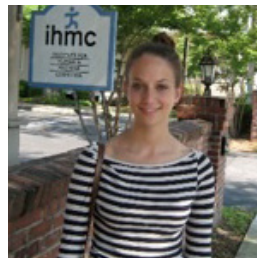
Lauren Vassiliades
Washington University in St. Louis
Sensory Substitution

Michael Vignati
Ecole Nationale Superior de Cognique
Software Agents

Miles Wallio
Florida Institute of Technology
Micro-Air Vehicles

LOCAL NEWS

■ ■ ■ NEWS OF IHMC

IHMC Launches TechConnect

TechConnect is IHMC's new science outreach program aimed at high school students. The summer program brings teens to IHMC where they create and deliver science education programs for elementary students. In addition, the teens visit labs and meet IHMC researchers.

Each summer teens choose a science education topic to present to elementary-age students. The first group chose to introduce the kids to Scratch, a computer program for kids to create games and animations. The kids were attendees at the Fricker community center summer program, located in the inner city of Pensacola. The students responded enthusiastically and many continued to work with Scratch throughout the summer.

They enjoyed meeting the IHMC researchers and getting an up-close look at how scientific research is conducted. Most did not have prior experience with any computer programs but ended their experience at IHMC eager to learn more about computer science.

In addition, the teens improved their teaching skills as well as gained experience collaborating with a diverse group of coworkers. While the program is unpaid, the students receive volunteer hours, and many enjoy the opportunities to volunteer in an area about which they are passionate.

The success of TechConnect has led to its expansion, with more teen opportunity in the future. With a larger group of teens, there will be more frequent visits to the community center, increasing the impact of the program. In addition, IHMC will provide an introduction to Java programming for the teens, to further develop programming skills.

The materials the teens develop during the summer program are designed to help IHMC increase its offerings for science education outreach.

TechConnect teens design around create science education programs for elementary schools

IHMC SUPPORTS ROBOPOLOOZA

Robot demonstrations at Robopolooza

IHMC joined the Cornerstone School in Ocala to sponsor Robopalooza, a middle school robotics competition. About 250 middle-schoolers from around the state brought their robots to Forest High School in Ocala for the competition.

Robopalooza was one of three qualifying contests in Florida. Judging was by students from Cornerstone School, and winners advanced to a regional competition. IHMC designed and distributed a Robopalooza t-shirt for the Marion County participants.

The program is part of the First Lego League, a series of competitions around the country challenging students to build robots. Each team gets a box of parts from Lego and a description of the challenge. Along with engineering skills, they learn teamwork and sportsmanship to create a successful project.

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LOCAL NEWS

■ ■ ■ NEWS OF IHMC

IHMC Robotics Lab Hosts Open House

As part of National Robotics Week, IHMC hosted an open house in the robotics lab. Visitors saw demonstrations of flying autonomous robots as well as Mina, IHMC's exoskeleton. In addition, videos were shown throughout the lab of a variety of on-going robotics research projects. Researchers were on hand to discuss the projects with visitors, often engaging in lengthy conversations. About 200 people attended the three hour event, with many school-aged children getting a first-hand look at scientific research. National Robotics Week celebrates robotics research and provides a forum for educating the public about robotics and inspiring students of all ages to pursue careers in robotics and other science, technology, engineering, and math-related fields. 🏃

IHMC Robotics Open House: Robotics team demonstrates new exoskeleton

RECENT LECTURES
■ ■ ■ IHMC'S EVENING LECTURE SERIES

Rob Spanier on Urban Planning

Lasting communities have a mixed-use, vibrant urban core. Rob Spanier shared his experiences in the planning, implementation, and development of mixed-use projects and the role that such developments have had in revitalizing cities, towns, and communities. Spainer is the Vice-President of LiveWorkLearnPlay, a cutting edge international urban development advisory firm dedicated to creating and redeveloping iconic mixed-use real estate projects and environments.

Michael F. Summers on HIV-1

HIV-1, which causes AIDS, is a retrovirus that has provided a unique challenge for medical research. Michael Summers described recent research on a new class of antiviral inhibitors that could lead to new treatments for AIDS. Summers is a Howard Hughes Medical Institute Investigator and Professor of Chemistry and Biochemistry at the University of Maryland, Baltimore County, and Adjunct Professor of Biological Chemistry at the University of Maryland School of Medicine in Baltimore.

Loren Cordain on the Western Diet

The current human diet, based on agriculture and animal husbandry, occurred too recently on an evolutionary timescale for the human genome to adjust. Our bodies are challenged by our diet, as evidenced by the many modern diseases stemming from our diets. Loren Cordain described the history of the Western diet and the health implications during his lecture. Dr. Cordain is a Professor in the Department of Health and Exercise Science at Colorado State University in Fort Collins, Colorado.

Glenn Sturm on Building Lasting Organizations

Strong leaders share many traits which can lead their organizations in overcoming obstacles. In particular, as Glenn Strum explained during his lecture, they realize that problems create opportunities, and they examine problems from many different perspectives to achieve better results. Strum is a partner of Nelson Mullins Riley & Scarborough LLP, where he practices in corporate, securities, and technology law.

Quint Studer on Healthcare

Quality of healthcare is an ongoing challenge, and it falls on the consumer to ensure that they receive the best care possible. During his lecture, Quint Studer stressed key steps consumers should take to control their care. Particularly, he shared insight into how to get the most out of an appointment or hospital stay and how to learn more about the care providers. Studer is the CEO and Founder of the Studer Group, which works with healthcare organizations to improve the quality of patient care.

John Norquist on City Building

The design of cities is central to their economic health. The vision of New Urbanism, as explained by John Norquist during his lecture, views each project as part of the whole rather than segregating uses. This vision provides an alternative to sprawl and an antidote to sprawl's social and environmental problems. Norquist is the President of the Congress for New Urbanism. He was mayor of Milwaukee from 1988-2004.

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RECENT LECTURES

■ ■ ■ IHMC'S EVENING LECTURE SERIES

Chuck Carlson on Market Risk

The investing market has entered an age of turbulence. The uncertainties in the market challenge investors to keep emotion out of their investment decisions. Chuck Carlson shared the power of process for unemotional investing during his lecture as well as profit opportunities and the power of dividends. Carlson is Chief Executive Officer of Horizon Publishing, one of the oldest investment newsletter publishers in the country, and writes and appears frequently to share his investing insights.

Rusty Schweickart on Asteroids

Asteroid impacts have shaped the history of the Earth. Modern technology has the potential to deflect threatening asteroids. However, according to Rusty Schweickart during his lecture, the bigger challenge lies in the political dimension. Schweickart is a retired Apollo astronaut and is the Chairman of the Board of the B612 Foundation, a non-profit entity that champions the development and testing of a spaceflight concept to protect the Earth from future asteroid impacts.

John Logsdon on Space Policy

John F. Kennedy challenged the nation to reach the moon. During his time in office, he also committed resources to achieve that goal, approving the mobilization of the vast resources required. John Logsdon reviewed the history of Kennedy's involvement with the Apollo program and analyzed its impact on the space exploration endeavor. Dr. Logsdon is Professor Emeritus of Political Science and International Affairs at George Washington University's Elliott School of International Affairs.

Tom Murphy on Competitive Cities

Successful cities of the future must adapt to modern forces such as climate change, technological innovation, and demographic shifts. During his lecture Tom Murphy described the transformation of Pittsburgh under his leadership as mayor to meet these challenges. Murphy is a senior resident fellow of the Urban Land Institute (ULI) and the Klingbeil Family Chair for urban development. He specializes in public policy, urban entertainment, transportation, housing, and environmental issues.

Michael Turner on Dark Matter and Dark Energy

The beautiful images from the Hubble telescope show only a small part of the universe. Ninety-six percent of the universe is made of dark matter and dark energy. Dr. Michael Turner described recent research toward understanding the composition and behavior of dark matter and dark energy during his lecture. Turner is the Rauner Distinguished Service Professor and Chief Scientist at Argonne National Laboratory.

General (ret.) Lester Lyles on Education

The nation is facing a critical challenge in maintaining leadership in science, technology, engineering, and math. The statistics, including the dearth of American citizens pursuing STEM degrees, show that we have a problem on our hands. General (ret.) Lester Lyles described the challenges, his particular concerns, and how the government and citizens can help. Lyles is a former Commander, Air Force Materiel Command, at Wright Patterson Air Force Base and member of the NASA Advisory Council.

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RECENT LECTURES

■ ■ ■ IHMC'S EVENING LECTURE SERIES

Jack Burns on the Cosmos

The Moon is a unique platform for fundamental astrophysical measurements of gravitation, the Sun, and the Universe. Jack Burns explained that these advantages justify the creation of a presence on the moon. Burns is a Professor in the Department of Astrophysical and Planetary Sciences at the University of Colorado (CU). He is also VP Emeritus for Academic Affairs and Research for the CU System and the director of the Lunar University Network for Astrophysics Research (LUNAR).

Roger Schank on Cognitive Science and Education

The current American high school was designed in 1892. During his lecture, Roger Schank explained how new research on cognitive processes could shape a new educational system, to better prepare students for future jobs. Dr. Schank is the Executive Director and founder of Engines for Education, Inc. He is also the Chairman and CEO of Socratic Arts, Inc. and the Director of the Institute for the Learning Sciences at the Business Engineering School of LaSalle University in Barcelona, Spain.

Eileen Collins on Leadership

Leaders can learn many valuable lessons from the Space Shuttle Columbia disaster and the subsequent investigation. Eileen Collins explained during her lecture how lessons such as valuing and practicing listening, humility, and creativity can help prevent disasters large and small. Collins is a former NASA Astronaut and retired Air Force Colonel and is currently Chairman of the Space Operations Committee of the NASA Advisory Council.

Dan Britt on Climate

Climate change has become a major political issue, but few understand how climate has changed in the past and the forces that drive climate. Dan Britt provided some of the historical context on climate change during his lecture. This history provides a context for the current climate debate and fundamental insights into how the climate works. Britt is an Associate Professor of Astronomy and Planetary Sciences at the Department of Physics, University of Central Florida.

Marion County Audience attending lecture in new Ocala facility

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40 South Alcaniz Street
Pensacola, Florida 32502
850-202-4462 phone
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