

IHMC Board of Directors Meeting Minutes
Monday, March 4, 2019
8:30 a.m. CST/9:30 a.m. EST Meeting

Roll Call Chair Bill Dalton

Chair's Greetings Chair Bill Dalton

Action Items

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| 1. | Approval of December 3, 2018 minutes | Chair Bill Dalton |
| 2. | Discussion on IHMC Financials and 990's | Director Dick Baker |

Chief Executive Officer's Report

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| 1. | Research Update | Dr. Ken Ford |
| 2. | State and Federal Legislative Update | Dr. Ken Ford |

IHMC Chair Bill Dalton called the meeting to order at 8:30 a.m. CST. Directors in attendance included: Carol Carlan, Bill Dalton, Ron Ewers, Eugene Franklin, Jon Mills, Eric Nickelsen, Mort O'Sullivan, Jay Patel, Alain Rappaport, Jim Reeves, Ray Russenberger, Martha Saunders, Gordon Sprague and Glenn Sturm. Also, in attendance were Ken Ford, Bonnie Dorr, Ryan Tilley, Ronnie Armstrong, Alan Ordway, Matt Doster, Jeff Hartley and Julie Sheppard.

Chair Dalton welcomed and thanked everyone who was there that morning both in person and to those who dialed in. He commented that it seems like the year is flying by as we are already in the spring meeting with the Legislative session in full gear.

Chair Dalton informed the Board that our very own Dr. Ford has been named to join an elite group of industry leaders on the newly formed National Security Commission on Artificial Intelligence. Created under the National Defense Authorization Act for 2019, adding that this independent federal Commission is expected to review global advances, investments, and strategies in artificial intelligence (AI) and related technology systems, evaluate foreign developments and investments in AI, and recommend steps the United States might take to support its technological edge, while ensuring national security and competitiveness. He added that he was sure the Board would hear more on this from Dr. Ford in his report but that it is exciting for both IHMC and Florida that Ken has been tapped for this role.

He also explained that he was pleased to announce that the University of West Florida and IHMC have partnered and have been approved by the State University System to begin a doctoral program in intelligent systems and robotics. He explained that the program will be the first of its kind in Florida and one of only a few in the nation and aligns with the strategic vision for research that impacts Northwest Florida's economic development and technology enterprise. He stated that this program would serve the manufacturing, health care, defense and other high-tech industries, providing critical support to high-demand career fields adding that he knows that both Ken and

Martha are both excited to launch this and that he was sure we will hear more on this as well.

He then moved directly into the meeting explaining that there were two items to discuss this morning followed by Dr. Ford's report.

He began by discussing Action Item 1, the December 3, 2018 Minutes and asked the Board for a motion to approve. Director Carlan moved approval followed by a second from Director Reeves. The motion to approve the December 3rd minutes carried unanimously with no discussion or edits.

Chair Dalton then introduced Agenda Item 2 and asked Ronnie Armstrong, IHMC Chief Financial Officer, to provide the financial report. Ronnie discussed the financials at length and explained that the Escambia County IHMC loan had been refinanced by the County allowing for the debt restructure and the elimination of \$869,000 in payments. He discussed the overall strength of the current financials and increases in revenues and offered to answer any questions.

There being no discussion regarding the financials, Chair Dalton thanked Ronnie for his report and work on the financials. Chair Dalton then asked Dr. Ford to provide his report.

Dr. Ford began his comments by thanking all of the Board members for participating in the board meeting, thanking those here in person as well as those on the phone.

Dr. Ford thanked Chair Dalton for the chance to provide this report and wished all a good morning. He also thanked the Board for the kind words about his new appointment to the newly formed National Security Commission on Artificial Intelligence explaining that it may be a daunting task as he has participated in the first meeting by telephone and it should prove one of the more interesting Boards he has been on. He stated that as many are aware of the AI Board makeup including former Google CEO, Eric Schmidt, and former US Deputy Defense Secretary, Bob Work, Oracle co-CEO Safra Catz, Director of Microsoft Research, Eric Horvitz, and CEO of Amazon Web Services, Andy Jassy, to name a few of the 15 commissioners ending by saying that he would keep everyone posted on the progress.

Dr. Ford then turned to State issues adding that it promises to be an interesting year and session ahead with new leadership in Governor's office and house and senate. He stated that he was pleased to have Jeff Hartley and Matt Doster with us this morning to give us a Tallahassee update and wished Jeff and Matt a good morning.

Jeff and Matt explained the new appointments that are key this session, discussed house and senate leadership, and the strategy for introducing IHMC to new legislators in Tallahassee. They fielded questions from the Board and discussed other hot issues that may come before the legislature this session. Dr. Ford thanked Jeff and Matt and wished the Tallahassee team luck.

Dr. Ford then turned to his sponsored research report explaining that IHMC was pleased that the Federal Shutdown was limited and did not last any longer as these shutdowns pose significant challenges for research organizations. He remarked that since December, IHMC has received over \$8 million in new funding explaining that he would mention three of the new awards that may be of special interest.

He mentioned that one of the awards that the Board members may have read about is the grant for the first phase of the Toyota Mobility Challenge. He added that as one of the five finalists, Dr. Neuhaus and his team have received a grant of \$500,000 to develop their concept further, with the final winner of the Challenge receiving \$1 million in Tokyo in 2020. He explained that the Challenge invited engineers, innovators, and designers from across the world to submit designs for game-changing technologies, incorporating intelligent systems, to improve the mobility and independence of people with lower-limb paralysis and that central to the Challenge is the importance of collaboration with end-users to develop devices which will integrate seamlessly into users' lives and environments, while being comfortable and easy to use, enabling greater independence and increased participation in daily life.

He then turned to other robotics funding explaining that Dr. Peter Neuhaus, in collaboration with Dr. Jerry Pratt, have also been funded by ONR to develop High Performance Humanoid Robots adding that this \$4.4M effort will entail research, development, and demonstration of SquadBot, a humanoid robot with the mobility to function in urban environments alongside soldiers as a robot squad member.

Dr. Ford mentioned that in our previous board meeting, he had discussed that IHMC was awaiting the execution of funds for Dr. Griffin, and many other IHMC team members and added that he was happy to report that the \$3,000,000 award from ONR has arrived commenting that this research, which is not unrelated to the grant we previously discussed, is to research, develop, and demonstrate high speed humanoid robot behaviors for tactical urban operations.

Dr. Ford then turned the conversation to pending awards informing the Board that we have approximately \$6.5 million in approved awards which are in contracting and that he would mention several of these pending awards.

He began by stating that Dr. Matt Johnson has a pending \$100K supplementation grant with NASA's Translational Research for Space Health (TRISH) program to augment Dawn's previously funded collaboration with CalTech in which they are collecting lymphatic function data. Specifically, he explained, the research aims to use machine learning techniques to provide the user feedback about the usefulness and quality of the data being collected in terms of accurately measuring lymphatic function in order to improve lymphatic function measurement. He added that this will ensure that the data collected is useful for generating accurate automatic assessments and that in addition, this approach should provide feedback about sensor physical positioning to improve data collection.

He continued by mentioning that Research Scientist, Dr. Parisa Kordjamshidi, a joint appointment with Tulane University, has pre-award spending approval but this award is still awaiting final contracting on her \$2M Office of Naval Research grant with a focus on developing a framework and novel underlying formalisms for integrating domain knowledge and statistical learning. He stated that the objective of this research is to find a breakthrough abstraction for designing AI systems based on data and knowledge representation rather than based on underlying computational units.

He continued on mentioning that Dawn Kernagis is awaiting final award of her SOCOM funded research in partnership with the SALK Institute for roughly \$1M explaining that the objective of the research is to evaluate the potential of a novel drug in enhancing physical performance in elite operators. He added that the individual aims include testing the safety, efficacy, and optimal dosing of the drug alone, and in combinations with various exercise-training modalities, in improving performance and the specific goals of this project include (i) enhancing endurance capacity and performance; (ii) improving metabolic efficiency; and (iii) enhancing cognitive function.

Dr. Ford mentioned that Dr. Kernagis also continues to await ONR's award of \$335K for her research aimed at addressing performance issues facing US soldiers in extreme conditions using exogenous ketones. He added that during high-intensity operations, a gap has been identified in providing soldiers the ability to sustain the high level of physical and cognitive output necessary to complete long duration mission sets. He stated that in addition to the physical performance benefits of ketosis that have been demonstrated in numerous studies, research has shown that ketosis improves spatial memory impairment caused by hypobaric hypoxia, in addition to conferring neuroprotective effects in a variety of conditions, including CNS oxygen toxicity.

Dr. Ford also mentioned that Dawn Kernagis and Jeff Phillips will lead a USSOCOM-funded Phase 2 STTR effort in collaboration with the ketone ester company, HVMN, following successful completion of a Phase 1 effort studying the effect of ketone ester on cognitive performance in the setting of moderate hypoxia. He stated that the Phase 2 effort will include assessment of cognitive performance in more extreme hypoxia, in addition to performance with hypoxic physical activity. He mentioned that the IHMC team will also conduct two field-based studies with military units to assess the effect of the ester in an operational setting and that the total funding will be approximately \$5M, with the IHMC component of the study roughly \$3M.

Dr. Ford then stated that this is also the time of year for IHMC to submit for new research initiatives and explained that we are very busy this quarter.

He informed the Board that Tim Broderick and Todd Norell have started 2019 with a very enthusiastic and aggressive approach and have begun the process of pulling together stellar interdisciplinary teams from across the country to respond to substantial DARPA programs. He explained that in the past, IHMC has typically preferred to be a team member rather than lead in the case of the most complex large multi-institution collaborations. But, he commented, with the addition of Tim and Todd, IHMC has decided to lead proposing against some of these large and complex solicitations that we have typically avoided leading.

In addition, he explained, IHMC's robotics researchers have been very busy both with ongoing research as well as submitting proposals to ensure a sustainable research program going forward. He stated that in the first half of February, this team submitted 6 proposals to the National Science Foundation's National Robotics Initiative and these proposals addressed a wide range of topics to include: Full-Body Wearable Robots for Heavy Load Tasks, Open Source Human-Machine Teaming Toolbox, Collaborative Mission Coordination for Urban Search and Rescue, Autonomous Humanoid Behaviors and Virtual Reality Interfaces for Collaborative Humanoid Avatar Robots, and Biologically-Inspired Running Robots. Dr. Ford commented that we anticipate positive results from at least some of our proposal efforts.

Dr. Ford continued his research report by remarking that IHMC continues to build our relationship with the Navy Experimental Diving Unit (NEDU). And that in an effort led by Dawn Kernagis and Tim Broderick we will work with NEDU to develop an underwater/under pressure eyetracking tool for Navy diving and that we should be proposing the effort to ONR within the next two weeks. He also explained that IHMC-Ocala has been busy working on a major DARPA proposal which they submitted just last week with Ian Perera and Bonnie Dorr playing the leading roles in pulling together the proposal which is titled, "Relational Embedding of Automatically Learned Integrated Schemas in Time" otherwise known as REALIST. In this effort, he explained, IHMC seeks to provide intel analysts with new tools to improve interpretation of world events, potentially preventing escalation of violence and improving response time for humanitarian relief. To accomplish this, he stated, the team will design, develop, and evaluate an approach to schema induction from multi-media, multilingual data that enables deep linguistic understanding of events and relations for extracting appropriate schemas from multi-media and multilingual data. He stated that the total requested funding is a little over \$7 million and that the PI is Ian Perera, with co-PIs: Bonnie Dorr, James Allen, and Peter Piroli.

Dr. Ford commented that IHMC continues to review the possibility of offering some online courses by partnering with Apollidan Learning to conduct significant marketing and back office support. He explained that this presents the opportunity for researchers to generate multiple revenue streams via the development of the curriculum and delivery of the coursework and that early discussions point to two courses of greatest interest to Appolidon including Ketogenic Nutrition and Artificial Intelligence.

He then turned the discussion to new team members adding that we are pleased to announce that this week, Adam Bruce will be joining IHMC, as Senior Research and Product Development Associate to assist numerous IHMC Scientists and Researchers on technology enhancements, augmented and virtual reality and generalized support of IHMC research and innovation initiatives. He explained that Adam comes back to his home town of Pensacola from San Francisco with 20 years of experience building ventures and user focused interactive products across consumer entertainment, enterprise and government adding that Adam has worked as Solutions Lead for AT&T's largest clients, has launched the first (pre-YouTube) social media video start-up, StreetFire which scaled to 42M users in 18 months serving a billion video streams. He explained that Adam specializes in adapting early stage technology into consumer products and that most recently, Adam produced a consumer entertainment VR experience for a Spielberg backed venture. He added that we are excited about the opportunities Adam brings to us to enhance deliverables for our customer communities by adding elements of augmented and virtual reality and that he hopes everyone will all join him in welcoming Adam Bruce home as it is always a pleasure to create the employment opportunities that bring native sons and daughters back to Pensacola and Ocala.

With regard to other happenings, Dr. Ford mentioned that as many of you may know, as part of Pensacola's Pensacon event, each year IHMC conducts tours/demos in the Levin Center Robotics Lab and that once again, the tours "sold out," making this one of the most popular Pensacon events. He explained that this year we hosted tours on Saturday and Sunday at two different times each day and that each one-hour session was attended by 25 registrants, who were individuals coming

to attend Pensacon. He explained that this year we also held a special tour with demos for a special guest — William Shatner and that Mr. Shatner had a fantastic visit and was impressed by the technology being developed here at IHMC. He added that several days later, we enjoyed a visit from Robert Watts, whom you will remember as the producer of Who Framed Roger Rabbit, Tomb Raider and Star Wars. And that Robert was over the top with his praise for the robotics work at IHMC.

Dr. Ford stated that in mid-February, IHMC hosted an overview and tour for some Congressional Staffers hoping to learn more about IHMC and bring this information back to their congressional leadership. He stated that among those in attendance included Mr. Paul Bonicelli, Senior Policy Advisor to Senator Rick Scott; Mr. Jonathan Arias, Military Legislative Assistant to Senator Marco Rubio; Lt Col James Vallario (USMC) with the Naval and Marine Corps Office of Leg. Affairs in the Pentagon; and Mr. Nathan Nelson, Director of Military Affairs for Congressman Matt Gaetz. He added that from what he understood, a fantastic conversation was had with great questions from the staffers and that all seemed impressed with the science and technology under development at IHMC and looked forward to seeing what IHMC would be doing next.

He also updated the Board that as we have discussed in the past, Cobalt Intelligence is a local company who looks to license technology coming out of IHMC and our most advanced effort to date is Cobalt's collaboration with IHMC to commercialize IHMC's programmable exercise device which Cobalt has named Galaxy. He explained that as part of its commercialization efforts, Cobalt will be taking one of the devices to Phoenix, AZ to have it tested at EXOS. EXOS is a human performance company headquartered in Phoenix with sites worldwide and once there, Cobalt will conduct significant tests on the devices as well bring in potential partners to demo its capabilities. He explained that everyone is very excited for the next steps of this exciting technology and we hope to have more news on this at our June meeting.

He then stated that IHMC recently hosted the newly formed federal agency known as Cybersecurity and Infrastructure Security Agency (CISA) which grew out of the Department of Homeland Security. He explained that CISA leads the national effort to defend critical infrastructure against the threats of today, while working with partners across all levels of government and in the private sector to secure against the evolving risks of tomorrow. He added that DHS and CISA is standing up a very big footprint here in locally at NAS Pensacola Corry Station and wanted to learn more about what IHMC does and that IHMC showed them some of its visualization technology and how it's being used in the cybersecurity arena. He commented that there is much interest from CISA in the potential value of these technologies and conversations are ongoing.

Dr. Ford also mentioned that in early February, IHMC solidified a sponsorship relationship with AppRiver, a local cloud base security solutions firm who has grown tremendously and now has a worldwide presence. He explained that AppRiver provided sponsorship funding of \$25,000 to support IHMC outreach programs and to celebrate this relationship, AppRiver shot a fantastic commercial containing IHMC's Ken Ford and Ryan Tilley and after IHMC hosted a cocktail reception with AppRiver, celebrating both this new relationship as well as the new Acquisition of AppRiver by Zix Corporation. He commented that tours were provided to all in attendance and many of the guests commented on the beautiful Levin Center.

Dr. Ford then turned the discussion to education and outreach remarking that the Evening Lecture Series is now celebrating its 20th anniversary and that in addition we are passionate about our collaborations with UWF, our Open Houses, Science Saturdays, and our popular podcast — STEM-Talk. He stated that tomorrow, March 5th, IHMC-Ocala will host Joe Gomes and he will share insight on lessons learned from serving elite populations, in particular evaluation & education, identification of key performance indicators, training & recovery strategies and injury & illness mitigation strategies adding that Joe looks forward to discussing some “low hanging fruit” that can help people of all ages and walks of life improve their physical and cognitive performance. He continued by mentioning that on March 14th, IHMC-Pensacola will host Andrew Taggart, a practical philosopher who will discuss the nature of work and how work, once the worst fate imaginable, has become the keystone of modern life and the moral center of almost every modern person’s earthly aspirations. Continuing he stated that in Pensacola on April 25th we will have Joe Gomes and May 14th will feature Todd White from Dry Farm Wines to wrap-up our Spring Season. He commented that in Ocala on April 4th we will have Dr. Duane Mitchell discussing the cancer Immunotherapy revolution and its relevance for brain tumors followed on May 2nd featuring Dr. Gideon Mailer discussing the historical nutritional building blocks that underlie human immunity. He stated that these lectures will finish our Spring season and added that he hoped everyone can attend one or more of the lectures and as always please let him know if you are interested in attending the dinner following one of these talks.

Dr. Ford mentioned that on April 12th we will be hosting our annual Robotics Open house which attracts about 1,000 visitors to the Levin Center for the event ... adding that as in the past we will have many of IHMC technologies up and running including a variety of robots, the cyber visualizations, UAVs and other fun science exhibits to wow our visitors.

Continuing his outreach discussion, Dr. Ford stated that the podcast, STEM Talk, continues to be a great success and we have just introduced Episode 83 featuring yours truly and Dawn Kernagis hosting “Ask Me Anything?” Remarking on Science Saturdays, Dr. Ford stated that this is going well at both locations and we are beginning to set dates for summer robotics camps. He also commented that we are also starting to look at summer internship hires at both locations.

Dr. Ford then turned to the Intelligent Systems & Robotics PhD Program commenting that as many may recall, on November 8th, the Board of Governors of the State University System unanimously approved the UWF-IHMC joint PhD in Intelligent Systems and Robotics. Since that time, he explained, IHMC has been actively working with UWF on the development of the PhD. And that there is a current national search for a Program Director and as he understands, there are some strong applications to be reviewed. He explained that the website is being finished and should be launched at any time to begin attracting candidates for the Fall of 2019 adding that to say we have had interest would be an understatement as we have had numerous inquiries at both IHMC and UWF from international students, military organizations and local people from a wide range of academic backgrounds. He explained that it is our intention to have a small but very carefully chosen inaugural class of PhD students and that he and Martha are working closely and have scheduled regular meetings to make sure we are on the same page as we head to the finish line and launch the program. He explained that we should have some exciting news about the first class of students and the Program Director at our June meeting.

Wrapping up his comments, Dr. Ford stated that all in all, the new year has started off well for IHMC. He thanked the Board members in advance for promoting IHMC to your local State legislators this session adding that any assistance is always appreciated. He thanked Chair Dalton for the opportunity to provide his report.

Chair Dalton thanked Dr. Ford for an excellent and comprehensive report and asked the Board for additional items. Hearing none, he explained that the next meeting is an in-person meeting in Pensacola scheduled for a Sunday evening, June 9th social followed by a Board meeting Monday, June 10th beginning at 8:30 am. He stated that more details would be forthcoming on the June meeting as we get closer. He then thanked the Board for their participation and promptly adjourned the meeting wishing everyone a great day.

The IHMC March Board meeting concluded at 9:45 a.m.

Respectfully submitted,

Julie L Sheppard
Corporate Secretary