

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

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| Roll Call | Chair Bill Dalton |
| Chair's Greetings | Chair Bill Dalton |

Action Items

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| 1. Approval of October 4, 2019 Minutes | Chair Bill Dalton |
| 2. Discussion and Approval of IHMC Audited Financials | Chair Finance Dick Baker |
| 3. Update on IHMC Executive Compensation Plan | Chair Bill Dalton |

Chief Executive Officer's Report

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

Adjournment

IHMC Chair Bill Dalton called the meeting to order at 8:35 a.m. CST. Directors in attendance included: Dick Baker, Carol Carlan, Bill Dalton, Ron Ewers, Eugene Franklin, Hal Hudson, Jon Mills, 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, Ronnie Armstrong, Ryan Tilley, Alan Ordway, and Julie Sheppard.

Chair Dalton welcomed and thanked everyone who was there that morning both in person and to those who dialed in.

Chair Dalton then began the meeting explaining that there were 3 items to discuss this morning followed by Dr. Ford's report. He introduced Agenda Item 1 asking for an approval of the October 4, 2019 Minutes. Director Sprague moved approval which was seconded by Director Carlan. With no changes, the October 4, 2019 minutes were unanimously approved.

Chair Dalton then moved to Agenda Item 2 and informed the Board that he wanted to share some good news. He then stated that the Defense Contractor Audit Agency (DCAA) had completed its annual audit of IHMC's indirect cost submission for the 2018 fiscal year and that he was happy to report that their audit did not contain any questioned or un-allowed costs and the rate as filed with ONR will be finalized. He then thanked and congratulated Ronnie Armstrong and his team and asked Dick Baker, IHMC Chair of Finance and Audit, to update the Board on the current financials. Director Baker moved approval of the Audited Financials and his motion was seconded by Director Carlan and passed unanimously.

Director Baker then discussed the current financial statements in detail and stated that the financials were good with the ability to have strong liquidity and a strong financial position. He

concluded by informing the Board that the net assets were increasing and that all the financial numbers were improving and that the financial report was very positive.

Finally, Chair Dalton introduced Agenda Item 3, and explained that he wanted to update everyone on the Executive Compensation Plan for Senior Level Leadership. He explained that we have researched all the issues and determined that these benefits were allowable under the current IHMC benefits plan and that effective January 1, 2020, IHMC will move forward with the three items: full payment of family health insurance; a \$7,500 wellness stipend and a \$7,500 Technology Stipend. He stated that in addition to Dr. Ford, five members of the senior leadership team were also identified to participate and they include Dr. Tim Broderick, Dr. James Allen, Dr. Bonnie Dorr, Dr. Pamela Dana and Julie Sheppard. He explained that this was in lieu of salary increases and that as the Board was aware that Dr. Ford had not taken a salary increase for some time and that these executive benefits would help him as well. Chair Dalton asked the Board for questions and hearing none, he explained that that concluded the action items and asked Dr. Ford to provide his report.

Dr. Ford thanked Chair Dalton and thanked the Board for participating in this meeting. He stated that immediately following his report, he was heading to Ocala and that it was hard to believe it is approaching the end of 2019. He added his appreciation for the opportunity to talk about IHMC's progress over the last quarter.

Turning to the federal legislative update, Dr. Ford explained that the federal outlook was unclear as the current continuing resolution expires on December 20th. He added that Congressional leadership and the Administration are continuing to work on a final agreement for FY 2020 appropriations. The Appropriations Committee Members recently met with Treasury Secretary, Steve Mnuchin, to discuss overall funding allocations and committee members hope to have an agreement on those allocations by year end. He explained that once these allocations are in place, the committees can begin the process of finalizing the 12 appropriations bills that fund the federal government.

He then turned to research funding and explained that IHMC continues to be successful with new research funding and between the October meeting and today, a period of only 8 weeks, we have been awarded \$5.3M in new funding. He explained that he would describe several of the new projects.

Dr. Ford commented that Dr. Matt Johnson has been very busy and he and his team have been awarded four new contracts. He stated that the first of which is an AFRL effort titled Airman Decision Making and Interface Research (ADMIRE) with a focus on developing and testing interface prototypes that will address missions where multiple operators actively coordinate and collaborate in the management of multiple, multi-domain unmanned vehicles. He stated that the second effort Matt has been awarded is an SBIR partnering with Modus Operandi to continue development of the Runnable Environment for Team Effectiveness and Assessment Metrics platform demonstrated in the Phase I effort by adding the social sensors and analytical capabilities required to drive scalable visualizations and a predictive outcome-based recommendation engine.

Ford added that Matt's third awarded project is a \$3.8M DARPA effort titled Artificial Intelligence for Successful Teams (ASIST). The team will utilize an innovative predictive computational theory called Predicting Effective Performance in Teams based on a unique approach to modeling teamwork called Interdependence Analysis. This program aims to generate detailed predictions about team processes and performance, make predictions about the effects of interventions, and inform improved designs of machine teammate architectures. Dr. Ford commented that Matt's fourth awarded program is a \$1M DARPA program titled Context Reasoning for Autonomous Teaming or CREATE. In this project, he explained that IHMC will provide proof-of-concept demonstrations that measure team resilience and robustness. IHMC researchers have designed a new variant of Capture-the-Flag, modified to emphasize multiple aspects of teaming as the evaluation domain. He explained that the goal is to aid AI agents (in this case drones) in accomplishing teaming in a decentralized manner adding that while many AI techniques depend solely on learning over unstructured data, IHMC's hybrid approach allows us to combine, learn, and adapt both structured and unstructured data.

Dr. Ford explained that Dr. Lucian Galescu has been awarded an Army Phase II SBIR titled Data-Driven Authorship Feature Extraction and Comparative Analysis Using Machine Learning; where he and other IHMC researchers will lead the research and experimentation on Natural Language Processing techniques for extracting authorship and intent from multiple types of text data including, but not limited to email, Twitter, and online publications.

He continued his research discussion mentioning that Dr. Anil Raj in collaboration with Quasar Inc. has been awarded a NASA SBIR titled Individualized, Noninvasive Speech Indicators for Tracking Elevations in Stress (INSITES). He added that as part of this research, the team will define features in speech known to indicate stress and develop algorithms to extract these features from recorded audio streams. He explained that the team will also develop the plans for software and/or hardware integration for a complete tool which can be easily implemented in NASA spacecraft and habitats to detect changes in stress acutely and over time, and to provide the personnel with insights into individual astronaut or crew stress.

Dr. Ford stated that Dr. Jeff Phillips has recently been awarded funding supporting Naval Medical Research Unit-Dayton (NAMRU-D) titled Fast Jet, explaining that NAMRU-D wants to reduce operational safety threats associated with Unexplained Physiological Events. He commented that to do so, the U.S. Navy and Air Force have developed sensors to integrate into tactical aviation to detect life-support system malfunctions and changes in operator functional state and that IHMC will develop technology that automates interpretation of data from multisensory arrays and identifies problems before the operator is negatively affected.

He continued mentioning that Dr. Alberto Cañas recently finalized a proof of concept program providing a customized version of IHMC's CMap Tools to Bank of America and that Bank of America continues to conduct their assessment of CMap and may be interested in entering into ongoing license agreement to maintain a version in their system for its employees to utilize. He stated that as recently as last week, Dr. Cañas was conducting demos to decision makers at Bank of America who provided very positive responses and that interest in this very impressive tool continues to grow.

Continuing on, Dr. Ford mentioned that David Fries is working with the City of Pensacola on The Park Learning Cloud; an evaluation project that will eventually educate, engage and guide community members using Augmented Reality (AR) in the outdoors, assisted by data and models to help citizens visualize possible STEM and Design information overlaid onto city park objects and properties. He explained that citizens using mobile devices can access unique learning information and identity of a piece of city park property to allow the public to learn about aspects of the park and of the natural world. He added that some of the Board may have seen the write up in the Pensacola News Journal about David Fries working with the First City Arts Center on a project titled 3DPrintsacola and that as part of Pensacola's recent FooFoo Fest, this project combined machine generated art with hands-on art-making practices. Dr. Ford stated that the public came out and celebrated the unveiling of a new interactive sculpture and watched artists incorporate 3D Printing processes and hands-on art making techniques.

Dr. Ford announced that Dr. Robert Hoffman will soon begin work on a program titled Cyber National Initiative stating that Dr. Hoffman and other members of the IHMC team will work on the development of tools and procedures for the observation and measurement of the individual and team cognitive work of cyber security service providers and network owners. He added that in addition, the IHMC team will mentor a cadre of trainee cognitive systems engineers in the identified methodology, including field research and observational methods.

He also informed the Board that Cybersecurity and generally all things Cyber, is a hot topic these days. Dr. Ford was pleased that Dr. Andrzej Uszok is beginning work on a new SBIR program titled Cyber Information Management and Mission Impact Analysis System stating that the objective of this effort is to research existing capabilities and develop new innovations as applicable to providing a multi-level security (MLS) cyber information management (CIM) system that assists stakeholders in analyzing and addressing potential mission impacts from cyber events.

Dr. Ford mentioned several pending awards stating that IHMC researchers have been busy proposing new work and have approximately \$2.3M in sponsored research projects in the negotiation phase. He mentioned that Dr. Kernagis has two Office of Naval Research awards pending. The first is titled Human Glymphatic Functions in Extreme Environments where she and her team will identify how glymphatic function and associated CNS-linked immune response is affected by extreme environmental exposures. The results from this research will provide seminal information on how activities common to Navy divers alter these critical physiological responses. He continued by stating that the second ONR project is titled Development of an Underwater Oculometric Assessment Tool where as part of this research, Dr. Kernagis and her team aim to develop a pressure resistant, diver mask fitted oculometric neurologic assessment tool. This tool will be tested for its ability to capture eye movement patterns associated with hypoxia and hypercapnia.

He explained that Dr. Peter Neuhaus and Dr. Robert Griffin are collaborating on a National Science Foundation program titled Learning Environments with Advanced Robotics for Next-generation Emergency Responders (LEARNER) where the broad objective of this effort is to generate technology-based solutions that can support and augment the performance and safety of emergency response personnel. He stated that Phase I of this program will significantly advance

emergency response operations and training through the development and prototyping of an adaptive, personalized mixed-reality learning platform that enables integrating advanced technologies for human augmentation. In addition, the program will substantially advance the knowledge and state-of-the-art in exoskeleton control, human-robot interaction, and human-computer interaction.

Dr. Ford also mentioned that as everyone may already be aware, IHMC has been collaborating with the Pensacola Police Department (PPD) on developing their drone program adding that in the next phase, the PPD is going to go through a short intensive indoor drone training program. He explained that the preliminary training provided preliminary training on the indoor drones, but this will be a more advanced type of flying and a more demanding flight environment to increase their proficiency and confidence. Dr. Ford commented that IHMC has recently received quite a bit of press for the PPD drone program informing the Board that the drones have been built, and re-engineered in a continuous improvement and expanded applications process, and the training and certification of the PPD pilots has been successfully completed. He commented that early on, one of the drones was used to locate and video a suspect on the run using its thermal camera and spotlight allowing the police to apprehend the suspect and obtain drone video footage of his flee for use in court. Dr. Ford informed the Board that at a public ceremony on October 25, 2019, the Mayor recognized Officer Lindbloom of the PPD with the Mayor's most valuable employee contribution to the City for the initiation and prosecution of the new PPD drone program and that at the same ceremony, the Mayor recognized each IHMC team member with an individual Citizen's Award. He added that the IHMC team members enjoyed the opportunity to make an impact locally and that IHMC has been approached by other law enforcement groups and recently have been asked to propose a similar program for the Santa Rosa SWAT team. In this project he added, the drone will have a carbon fiber frame to protect it from collisions and will be flyable using first person view (FPV) goggles. He explained that these programs build on one another and benefit an overall law enforcement approach and that just last month, the drone team used the local PPD project as an example in proposing for a large, up to \$1 million, federal drone development award.

Dr. Ford then turned the discussion to facilities issues explaining that IHMC is currently working on the case statement for funding of the Ocala first floor project to include the buildout of offices and research lab space as well as designated and non-designated funding for IHMC as a whole. He stated that we will be beginning our "asks" in late January and currently artist renderings and architect selection are in the initial planning stages. He continued on discussing Ocala, stating that IHMC has hosted a number of community non-profit events; including Leadership Ocala and in January, we will be hosting Leadership Florida. Dr. Ford informed the Board that with regard to facilities, the first floor water issues are being handled with final modifications to the existing AC water lines, which will work with any renovations and that the industrial grinder pump (that the city is providing a donation of approximately \$60k) is built and in storage with the installation date for early January 2020. He stated that he hoped, barring catastrophic flooding, that IHMC Ocala will not have any more issues with the city stormwater sewage.

Dr. Ford continued the facilities discussion by mentioning that in Pensacola, we are looking at long overdue renovations to 40 S. Alcaniz explaining that there are still a number of issues post the 2014 flooding with the envelope of the building to address including pressure washing, exterior

paint, fence restoration, and exterior walkway renovations. He also commented that in addition, it may come as a surprise but we have never renovated the upstairs of Building 40 since moving into the building in 1999. He commented that it is past time for carpeting, painting, acoustic tile replacements and other work to improve the quality of these offices and common areas.

Dr. Ford briefly mentioned education and outreach stating that both the evening lecture series and Science Saturdays for youth have been enjoyable and engaging, with strong attendance. He mentioned that front desk staff at both locations go the extra mile to support these events, in particular Ashley, Zach, and Maddie in Pensacola, and Brooke and Jose in Ocala. He commented that the two remaining Science Saturday programs this year will be Brain Games offered in Ocala by Dr. Archana Bhatia and Reaction Time offered by Dr. Pat Hayes in Pensacola.

Dr. Ford informed the Board that the IHMC podcast, STEM-Talk, is coming up on its 100th episode and 2 million downloads and has recently received the People's Choice Award.

Dr. Ford also informed the Directors that the Science Advisory Council (SAC), the IHMC non-fiduciary Board, convened on October 20th and 21st in Pensacola with SAC Council members in attendance including: Alfred Harms, Paul Kaminski, Larry Lemanski, Dwayne McCay, JoAnn Morgan, Bill Mularie, Alain Rappaport, and Morley Stone. He explained that the IHMC presentations were made to the Board and included Scientists: Brent Venable, Peter Neuhaus, Robert Griffin, Dawn Kernagis, Andrew Koutnik, James Allen, Adam Dalton, Peter Pirolli, Tim Broderick, and himself. He added that the SAC provides IHMC with valuable council and insights and that IHMC very much appreciates their participation and especially that of Alain Rappaport who serves on both the SAC and this Board and provides liaison function between the boards.

Dr. Ford then completed his report thanking the IHMC Board of Directors for all of their continued confidence in IHMC and for the continuing support. He stated that he speaks for everyone at IHMC when he says that we truly appreciate the time and commitment to the Institute.

Dr. Ford then thanked Chair Dalton for the opportunity to provide his report.

Dr. Dalton thanked Dr. Ford for another excellent report and asked the Board members for questions. Hearing none, he reminded the Board that Thursday, December 12th was the Ocala Christmas Party and that Thursday, December 19th was the Pensacola Christmas party and that he hoped everyone could attend at least one of these fun events.

He then adjourned the meeting at 9:35 AM central time and wished everyone a happy and safe holiday season.

Respectfully submitted,

Julie Sheppard
Corporate Secretary