

IHMC Board of Directors Meeting Minutes
Monday December 7, 2015

8:30 a.m. CST/9:30 a.m. EST Teleconference Meeting

Roll Call	Chair Ron Ewers
Chair's Greetings	Chair Ron Ewers
Action Items	
1. Approval of October 7, 2015 Minutes	Chair Ron Ewers
Chief Executive Officer's Report	
1. Update on Pensacola Expansion	Dr. Ken Ford
2. Research Update	Dr. Ken Ford
3. Federal Legislative Update	Dr. Ken Ford
4. State Legislative Update	Dr. Ken Ford
Other Items	
Adjournment	

IHMC Chair Ron Ewers called the meeting to order at 8:30 a.m. CST. Directors in attendance included: Dick Baker, Carol Carlan, Ron Ewers, Eugene Franklin, Hal Hudson, Jon Mills, Eric Nickelsen, Mort O'Sullivan, Alain Rappaport, Jim Reeves, Rau Russenberger and Gordon Sprague. Also in attendance were Ken Ford, Bonnie Dorr, Sharon Heise, Row Rogacki, Phil Turner, Alan Ordway, Ann Spang, Kristine Crane and Julie Sheppard.

Chair Ewers welcomed and thanked everyone who dialed in this morning and noted as a matter of housekeeping, that the next Board meeting is an in person meeting scheduled in Ocala beginning with dinner on Sunday evening February 7 and the Board meeting in person at the Ocala office on Monday, February 8 from 8:30 to noon. He asked that everyone note this meeting date on your calendar and more information will be forthcoming on hotel accommodations and dinner arrangements.

With those comments, Chair Ewers moved directly into the meeting asking for a discussion and approval of Action Item 1, the October 7, 2015 minutes. A motion was made by Director Reeves and seconded by Director Baker to approve the minutes and this passed unanimously. Chair Ewers also informed the Board that he was continuing to work on a CEO compensation plan that meets Dr. Ford's needs and that he would continue to keep the Board apprised on this issue.

Chair Ewers then concluded the action portion of the agenda and asked Dr. Ford to provide his report. Dr. Ford thanked Chair Ewers and all the Board members for their attendance and began his report.

Dr. Ford began by commenting that given the short eight weeks since the last meeting, there are only a few new awards to report, especially since IHMC reported on a near record \$13 million in

new funding last time. He added that another interesting artifact of this research report is that nearly all IHMC's new awards are from the private sector, totaling \$2.3 million and that as many know, IHMC has been increasingly trying to diversify its funding sources, and that appears to be going well.

He mentioned that one of IHMC's newest private sector partnerships is with InterDigital, Inc, a mobile technology research and development company that forges invention partnerships with research institutes and universities around the world through its Innovation Partners division. He explained that InterDigital is establishing multiple research agreements with IHMC, primarily focusing on challenges related to mobility, security, vehicle-to-vehicle networking, vehicle-to-infrastructure communications, maps, navigation and multi-modal human-machine interaction in the connected vehicle domain.

Dr. Ford stated that InterDigital's first project with IHMC is with Dr. Jeff Bradshaw's team, where they are sponsoring a \$400,000, 1-year effort in the area of policy-governed autonomous vehicle collaboration for commercial delivery services. In this project, he stated, IHMC will study interfacing future connected ground and air vehicles with smart city and smart infrastructure services, enabling combinations of ground and air vehicles to support package delivery scenarios two to ten years into the future.

Dr. Ford explained that the second project InterDigital is sponsoring with IHMC is a 1-year, \$425,000 effort in the area of collaborative road memory adding that in this effort, Dr. Niranjan Suri and his team will be enabling collaboration vehicle-to-vehicle and between vehicle networks and the infrastructure by collecting information from vehicles about surrounding vehicles and roads, inferring behavior and needs of neighboring vehicles, and sharing relevant information with nearby vehicles or infrastructure to support safety and commercial use cases 2-15 years in the future. He concluded by adding that tomorrow, December 8, Niranjan will be speaking during an IEEE webinar sponsored by InterDigital on the topic of bringing connected vehicle technology to the next level. Dr. Ford ended this discussion by adding his expectation that more collaborations will develop with InterDigital in the future, and that he believes these new partnerships will be great opportunities for innovation with the potential to lead to a number of new breakthroughs.

Dr. Ford then mentioned another non-traditional funding arrangement where Dr. Anil Raj has partnered with a local individual to develop a lightweight exoskeleton-based device that will provide weight-bearing support for the leg during standing and walking. He mentioned that this device will exploit novel passive dynamics mechanisms to augment existing lower limb muscle activities during normal activities of daily living. In addition to passive support, Dr. Ford explained that the device will also incorporate functional electrical stimulation to directly stimulate lower limb muscle groups and supplement the passive mechanisms on demand. He informed the Board that the device is intended to aid anyone suffering from lower limb muscle fatigue, weakness, or balance difficulty, such as that caused by degenerative nerve problems.

Dr. Ford also informed the Board that Dr. Brent Venable has received the first of five years of funding from the Future of Life Institute fund, a donor advised fund of the Silicon Valley

Community Foundation, that supports projects and research aimed at keeping artificial intelligence beneficial. He commented that Brent will study the embedding of safety constraints, moral values, and ethical principles in intelligent agents, within the context of collective decision making systems in societies of agents and humans explaining that IHMC believes this work will benefit any scenario where humans and agents are acting in the same environment and making shared decisions, such as is anticipated in the future of transportation, assistive technology and health care.

Dr. Ford then concluded his research report mentioning that Drs. Jerry Pratt and Peter Neuhaus have received notice of an award from MegaBots, an Oakland CA-based company founded in 2014 to pursue one thing, Giant. Fighting. Robots. He explained that Jerry and Peter became involved with MegaBots in advance of a Kickstarter campaign in which MegaBots' Team USA challenged Japan to a giant robot duel between the Mark II, a 12,000 lb, 15 foot tall human-piloted robot, and Japan's own Kuratas at 9,900 lb and 13 feet and that Japan accepted, on the condition that it would be a "mele." He informed the Board that the campaign launched on 18 August 2015, and by 18 September it was fully funded at \$554,592 by 7,857 backers, presumably all people pursuing their childhood dream of giant robot battles. He explained that the Kickstarted campaign will support upgrades to the current Mark II, which tops out at 2.5 mph and is built for long-range paintball combat, but will need to be enhanced to perform hand-to-hand combat adding that the IHMC robotics team will be enhancing the Mark II's dynamic balancing and mobility, while other MegaBot partners will provide a life safety system (NASA), software and design tools (Autodesk), a Hollywood-grade paint job (FonCo), and other improvements. Dr. Ford ended this discussion by stating that in the words of IHMC's own Doug Stephen, "when we're done with the Mark II, it's going to float like a butterfly and sting like a charging rhinoceros."

Dr. Ford then turned his attention to new hires announcing that he is very pleased to report that David Fries has joined IHMC November 30 as a research scientist and explaining that Fries is a renowned undersea technology expert with 35 patents to his name and has been a faculty member at the University of South Florida for the past two decades. Dr. Ford added that Fries is known for developing underwater sensors and robots, which have been used for a variety of applications, from detecting oil spill contamination and submarines, to taking fish counts to help Florida manage its fisheries and recreational fishing. He informed the Board that IHMC expects great things from David and that he hopes everyone will get to meet David soon.

Dr. Ford commented that joining David is his colleague Geran Barton stating that Geran is a Oceanographic Systems Engineer, with extensive knowledge in marine engineering and design, oceanography, environmental and marine geology and climatology and he has accrued over 15 years of mechanical and electrical design of various environmental assessment instrumentation and structures and has experience working with various underwater autonomous vehicles. He added that since 2008, Geran has worked at USF St. Pete as an Oceanographic Technical Specialist and Systems Engineer, developing all electrical and mechanical aspects of automated robotic technology for raw material sampling within marine and terrestrial environments; operating and maintaining autonomous underwater and surface water vehicles; designing

technology for grouper tissue sampling; and creating innovative structures for improved artificial reef systems.

Dr. Ford concluded his new hire section mentioning that Dr. Guillaume Brat has joined IHMC as a new Senior Research Scientist and for the next several years, Guillaume will be detailed to NASA Ames Research Center in Silicon Valley as a Senior System Scientist under the Intergovernment Personnel Act, or IPA, which provides the federal government access to private sector expertise on a temporary employment basis. He mentioned that while at NASA, Guillaume will be the lead scientist for a robust software engineering area, coordinating research activities pertaining to software verification and validation, flight software development, and assured autonomy. He stated that at the conclusion of his IPA, IHMC looks forward to Guillaume returning to IHMC with his breadth of NASA experience and help infuse IHMC research programs with significant new knowledge to support national aerospace interests.

Turning to current employee news, Dr. Ford informed the Board that Dave Atkinson, Senior Research Scientist in Ocala has accepted an intergovernmental personnel assignment at NASA where he will become Director of a new research institute on autonomy technology at NASA Ames Research Center (ARC). Dr. Ford mentioned that while Dave will remain an IHMC employee, this is a senior executive position that reports to the Associate Center Director at Ames. He added that the institute, which will stand up next year, spans strategic research and technology challenges for autonomy in the domains of aeronautics and space exploration and that there will be a core staff on site as well as the typical assortment of jointly appointed associate and affiliate staff across NASA and at external organizations world-wide. Dr. Ford stated that while physically located in the heart of Silicon Valley, this institute will work with high tech companies and universities on autonomous intelligent systems technology for NASA and other agencies adding that this is a great opportunity for Dave and we all wish him success in this new endeavor.

Dr. Ford then turned to the finances informing the Board that, as all may recall, this Board approved the external draft audit in October and IHMC is pleased to report that it has been finalized for the fiscal year ending June 30, 2015 and has been filed with the various organizations that require the audit reminding the Board that the audit had a “clean” opinion and there were no findings or management comments. He continued on mentioning that IHMC’s tax returns were completed as well and were reviewed by Director Dick Baker before filing commenting that in addition to our usual tax filing of a 990, IHMC was also required to file a form 990 – T since IHMC had unrelated business income. He added that there was no tax liability as IHMC expenses incurred in earning the revenue exceeded the earnings and that this UBIT mainly comes advertising revenue received from Google ads.

He continued his report stating that the IHMC Indirect Rate Calculation for the fiscal year ended June 30, 2015 has been completed and timely filed with the Office of Naval Research (ONR) reminding the Board that ONR is IHMC’s cognizant reporting agency and that each year IHMC is required to calculate its indirect cost and submit the results. He concluded by stating that there were no significant fluctuations in our rate over last year and that IHMC is able to maintain a constant rate of 59%.

Dr. Ford then turned to the State, adding that IHMC is again in the Governor's recommended budget at \$2.7 million although we have put in a 2016-17 request for \$4.2 million. He explained that as all can imagine, the \$4.2 would be a big help to successfully furnish and occupy the new Pensacola facility and reroof the Ocala building. He suggested that any words of encouragement the Board could provide at the House or Senate level is greatly appreciated and reminded everyone that session starts in early January this year. He mentioned that this appears to be a good year in terms of State surplus and IHMC hopes to be successful with this request.

Dr. Ford turned the discussion to facilities updating the Board that the IHMC Ocala Ground Floor Partial Renovation, delayed due to radon issues, is showing a current radon level being maintained at a reading of less than 2.0 pCi/L, which is well below the EPA recommended action level of 4.0 pCi/L. He also explained that IHMC has received a preliminary cost estimate for re-roofing the building using a similar tile roof, replacing the skylight, repairing the gutter system, and re-coating the ceiling fireproofing for a total cost of approximately \$492,000 for tile roof, and \$450,000 for metal roof. He stated that this estimate of work will include the required design and permitting and that recoating the interior ceiling would add an additional \$66,000 to the total cost.

Dr. Ford then updated the Board on the IHMC New Building Construction commenting that the new building project is well underway and currently 60% complete. He explained that work continues on the exterior insulation and sheathing, brickwork, and roofing and added that the interior piping, ductwork, electrical panels, and interior wall framing is also underway while the mechanical building, electrical transformer, and major utilities are completing installation. He added that the total project is behind schedule but the contractor is working diligently to expedite the project without sacrificing quality.

Turning to current occupied space, Dr. Ford explained that the initial relocation of equipment and supplies in the 100 South Alcaniz research lab are underway due to lease expiration and that the running robot treadmill, large hydraulic pump, and other equipment will be moved and stored until completion of the new facility.

Dr. Ford then updated the Board on a long standing issue explaining that IHMC is very hopeful that before the February Board meeting, IHMC will at long last have acquired the Malone property; the 30 by 100 foot lot on Romana Street that sits adjacent to the new Building. He explained that this lot has been tied up in an estate with 10 heirs and that IHMC has tried unsuccessfully to purchase the property for years adding that while we planned the construction around this piece of property, acquiring it soon will provide more options on drainage, parking and developing a permaculture garden on site.

Turning to the main facility at 40 S. Alcaniz, Dr. Ford updated the Board on the flood repairs mentioning that FEMA is in the final stages of approval and funding allocation for the reimbursement for permanent repairs, contents replacement, and funding the new flood wall/flood gate project for the main building adding that the anticipated FEMA funding amount for this work is approximately \$1,390,738.21. He explained that the flood wall/floodgate system will be 75% funded by FEMA to protect the existing main building and contents from future

flood damage adding that the waterproofed floodwall will surround the existing building and have floodgates at each entrance and that these floodgate will deploy automatically if a flood event occurs without any human intervention or electricity and will automatically return to their resting position as the floodwaters recede.

Dr. Ford then mentioned the DooLittle Institute stating that as everyone may recall, Associate Director Row Rogacki has been detailed to DooLittle and as hoped, this has led to increased collaborations for IHMC. He stated that IHMC videographers Billy Howell and Jason Conrad have been working on a video for DooLittle highlighting innovation titled Innovation Discovery and that our very own Chair, Ron Ewers, is in it, part of a panel evaluating innovative intellectual property explaining that Ron was one of the seven panelists from around the country who reviewed the inventors' ideas.

Dr. Ford continued on in his report by informing the Board that Alberto's Cañas' concept mapping work for DooLittle work is complete adding that Alberto did a great job putting together a set of concepts map that outline the DooLittle Technology Transfer tools and resources and that customers from AFRL participated in the process and were favorably impressed by their experience. He added that it was his understanding that the DooLittle intent is to eventually share the concept map with the other four AFRL Institutes.

Dr. Ford continued by mentioning that IHMC also co-hosted a booth at the annual Air Armament Symposium, featuring three of IHMC's robots and that Sharon Heise and Row Rogacki represented IHMC in the booth and were also part of the "Heritage Panel" at the symposium, along with three retired general officers and a retired SES. He explained that during the presentation, entitled "Innovation is a Team Sport," Sharon and Row featured IHMC's robotics team and their experience during the DARPA competition and Sharon also gave an "Ignite" talk. He mentioned that a large segment of the munitions community was there, with over 500 people in attendance and that the IHMC-DooLittle panel was judged the best of the two-day symposium. He concluded by stating that IHMC is very happy that this collaboration with DooLittle is continuing to flourish and we hope to do even more in the future.

Dr. Ford then continued on to IHMC outreach explaining that Science Saturdays is wrapping up for this year but that there will be several exciting sessions beginning in 2016. Among those in Ocala, Dr. Ford mentioned that January 9th would showcase Dr. Ursula Schwuttke demonstrating Lemon Batteries and Solar Cells followed by Ian Perera on February 6 with Paper Airplanes, March 5 featuring Dr. Manal Fakhoury on Reaction Time and concluding on April 2 with Scott Mitchell, on the topic of Investigating Florida's Springs. Turning to Pensacola, he informed the Board that January 23 would feature Dr. Peter Neuhaus with Electric Motors, followed by February 20 with Dr. Lashmi Prayaga on 3-D Printing, and a repeat on March 19 with Dr. Sebastien Cotton demonstrating Running Robots and concluding on April 23 with Dr. Row Rogacki doing his very popular session on Gravity.

Dr. Ford then turned the conversation to the evening lectures explaining that just this past week Pensacola concluded the fall series with a lecture by Dr. Jay Dean and that the Ocala fall lectures will conclude on Tuesday December 15 with a lecture by Dr. Rhonda Patrick. He added that the

Spring series looks promising with 5 lectures in each location, commenting that in Pensacola spring lectures include as follows: January 21, 2016 features Dr. Richard Moon discussing From the Ocean Depths to the Mountain Tops: How do Humans Adapt?; February 18, 2016 Pensacola will host Dr. Harrison Schmitt speaking on 1903-1969 Wrights to Armstrong; followed by Kerry Emanuel on March 24th discussing What we Know about Climate Change; and then Joan Vernikos on April 6, speaking on Third Age Health: Aging Well in Modern Times and concluding on May 18, 2016 with Leo Thorsness, a Retired colonel in the United States Air Force who received the Medal of Honor for his actions in the Vietnam War and who was awarded the medal for an air engagement on April 19, 1967.

And in Ocala, Dr. Ford explained that the Spring lecture series includes talks by Mac Stone, on January 27. Mac being a photographer who will be talking on: A Walk Through the Everglades; followed by a talk on February 9 by Dr. Mark Mattson, Mark being the Chief of the Laboratory of Neurosciences at the National Institute on Aging, and Professor of Neuroscience at Johns Hopkins University; and that March 31, will feature Brian Shul discussing From Butterflies to Blackbirds, continuing with an April 28, lecture by Dr. Brent Reynolds from the Department of Neurosurgery at the University of Florida, and adding that the Ocala Spring series will wrap up on May 12 with Dr. Joseph Signoreli, an orthopedic surgeon in Duluth, Minnesota affiliated with Essential Health-St. Mary's Medical Center.

Dr. Ford then concluded his report by mentioning that it is that time of year for parties and celebrations adding that at IHMC we are extremely grateful for such a good year with many successes and we hope that 2016 continues in that same direction. He commented that he hoped to see all of the board members at one of the upcoming IHMC Holiday parties adding that IHMC Pensacola celebrates this Friday December 11th from 5-9 with all being welcome and that Ocala's Holiday Celebration will be Thursday December 17th from 5-8 and we look forward to seeing our central Florida Directors at that festive event. He thanked all the Board members for their support and wished everyone a happy and healthy holiday season! He then informed Chair Ewers that he had concluded his report.

Chair Ewers thanked Dr. Ford for his excellent report and asked the Board if there were any additional items. Hearing none, Chair Ewers adjourned the meeting at 9:40 central time wishing all a happy holiday season.

Respectfully submitted,

Julie Sheppard, Corporate Secretary.