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PRESS RELEASE

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Dr. Russell H. Taylor, John C. Malone Professor at Johns Hopkins University, Receives the Honda Prize 2015 for Contributions in the Development of Surgical Medical Robots and Systems and Technological Evolution in the Field

The Honda Foundation, a public-interest incorporated foundation created by Honda Motor's founder Soichiro Honda and his younger brother Benjiro Honda and currently headed by Hiroto Ishida, is pleased to announce that the Honda Prize 2015*1 will be awarded to Dr. Russell H. Taylor for his tremendous contributions in the development of medical robots, technological evolution in this field, and producing highly skilled technical personnel. Dr. Taylor is a professor at Johns Hopkins University, currently one of the leading medical schools in the United States, and is also a director of CISST ERC (Engineering Research Center for Computer-Integrated Surgical Systems and Technology) and LCSR (Laboratory for Computational Sensing and Robotics). He has been involved in technological evolution and fostering of personnel, and remains active in this field as a leading figure. Dr. Taylor is the 36th laureate of the Honda Prize. The award ceremony will be held at the Imperial Hotel in Tokyo on November 17, 2015. In addition to the prize medal and diploma, the laureate will be awarded 10 million yen.

Dr. Taylor has been engaged in development of medical robots for 40 years—the field of medical robot was technically non-existent when he started research—and has driven the field as a global leader for the last three decades. In addition, Dr. Taylor is one of the pioneers who established the field of robot research in the 1970's and is one of the most renowned scientists in this field. He has become widely known as the "father of medical robotics."

The hip replacement surgery assistant robot "ROBODOC," the prototype of which was primarily developed by Dr. Taylor when he was employed at IBM Watson Research Center, is the world's first important surgical assistant robot which supported the surgical process. Many of the concepts developed for ROBODOC were subsequently incorporated in robotic systems for many different surgical applications. Concurrently, Dr. Taylor also led development of a surgical assistance system for craniofacial surgery. This system was one of the first surgical navigation systems for non-neurosurgical applications.

While still at IBM, Dr. Taylor also developed the Laparoscopic Assistant Robotic System (LARS) which constantly displays the surgical field at the center of a screen to be monitored by the operator during laparoscopic surgery. Under the conventional method in laparoscopic surgery, because a surgeon could not manipulate an endoscope and adjust the surgical field on the screen to have the optimal angle and perspective by him/her self, the surgeon needed to rely on an assistant for the manipulation of the endoscope. However, this system solved this problem by attaching a joystick to the surgical instrument in order to enable the surgeon to manipulate the endoscope by him/herself. By indicating the part he/she wants to focus on within the surgical-field screen by using the joystick, the computer controls the camera position powered by the robot technology, thus the surgeon can constantly view the surgical field on the screen in the desired way. During the development of this

system, mechanical safety was achieved by adopting the Remote Center of Motion (RCM) mechanism and this safety concept is also employed in the da Vinci computer-assisted surgical system which has been adopted worldwide.

Furthermore, Dr. Taylor was among the first to spread the concept of "Computer Integrated Surgery" (CIS) and "Surgical CAD/CAM" as well as leading the field by organizing international conferences on medical robotics and CIS such as Medical Robotics and Computer Assisted Surgery (MRCAS), Medical Image Computing and Computer-Assisted Interventions (MICCAI), and Information Processing and Computer-Assisted Interventions (IPCAI).

Established in 1980, the Honda Prize is awarded annually to an individual or group to recognize accomplishments in the field of ecotechnology*2, which works to advance human achievement while concurrently preserving the natural environment. The concept of computer-assisted (robotic) surgical system has brought about a revolution in surgical methodology. It enables minimally invasive surgery and realizes not only easing the patients' pain but also shortening the hospitalization period as well as reducing medical expenses.

In this manner, the evolution and further application of medical robots will make the national medical economy more efficient and, therefore, increase society's healthy and active population. As a consequence, this is considered as contributing to the Honda Foundation's goal—"Creating a truly humane civilization." Therefore, the medical systems developed by Dr. Taylor and his contributions in furthering the expansion and innovation of the medical robotic field are considered appropriate for the Honda Prize recognition.

*1 Honda Prize: Japan's first international science and technology award inaugurated in 1980.
*2 Ecotechnology: Coined from "ecology"—the house of civilization—and "technology." It has been put forward since 1979 as the guiding philosophy for a better symbiosis between technology-driven civilization and nature.

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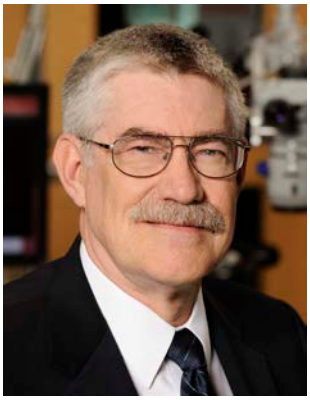
Dr. Russell H. Taylor

John C. Malone Professor at Johns Hopkins University



Born

June 1948, Virginia, USA (USA citizenship)

Education and Training

1970: Johns Hopkins University
1976: Stanford University, Ph.D. in Computer Science (Doctor of Engineering)

Employment History

1968–70: Johns Hopkins University, Research Assistant
1970–76: Stanford University, Research Assistant
1976–95: IBM T. J. Watson Research Center, Research Staff Member and Research Manager
1995–current: Johns Hopkins University, Professor of Computer Science with joint appointments in Radiology, Mechanical Engineering, and Surgery. (Named first John C. Malone Professor in 2011).
1998–current: Johns Hopkins University, Director of the Engineering Research Center for Computer-Integrated Surgical Systems and Technology (CISST ERC)
2013–current: Johns Hopkins University, Director of the Laboratory for Computational Sensing and Robotics (LCSR)

Biographical Sketch

Dr. Russell H. Taylor has over 38 years of professional experience in the fields of computer science, robotics, and computer-integrated interventional medicine. He received a Bachelor of Engineering Science degree from Johns Hopkins University in 1970 and a Ph.D. in Computer Science from Stanford University in 1976. He joined IBM Research in 1976, where he developed the AML robot language and managed the Automation Technology Department and (later) the Computer-Assisted Surgery Group before moving in 1995 to Johns Hopkins University, where he is the John C. Malone Professor of Computer Science with joint appointments in Mechanical Engineering, Radiology, and Surgery and is also Director of the Engineering Research Center for Computer-Integrated Surgical Systems and Technology (CISST ERC) and of the Laboratory for Computational Sensing and Robotics (LCSR). Dr. Taylor's research interests include robotics, human-machine cooperative systems, medical imaging & modeling, and computer-integrated interventional systems. He is the author of over 400 peer-reviewed publications and book chapters, a Fellow of the IEEE, of the The American Institute for Medical and Biological Engineering (AIMBE), of the The Medical Image Computing and Computer Assisted Intervention (MICCAI) Society, and of School of Engineering the University of Tokyo. He is also a recipient of numerous awards, including the IEEE Robotics Pioneer Award, the MICCAI Society Enduring Impact Award, the IEEE EMBS Technical Field Award, and the Maurice Müller Award for Excellence in Computer-Assisted Orthopaedic Surgery.

Major Publications

Taylor, R.H., S. Lavallee, G. Burdea, and R. Mosges, Editors, **Computer-Integrated Surgery**, 1996, MIT Press: Cambridge, Mass.

Taylor, R. H. and L. Joskowicz, "Computer-Integrated Surgery and Medical Robotics," in **Standard Handbook of Biomedical Engineering and Design**, M. Kutz, Editor, 2002, McGraw Hill.

R. H. Taylor and P. Kazanzides, "Medical Robotics and Computer-Integrated Interventional Medicine," in **Advances in Computers**, vol. 73, M. Zelkowitz, Editor: Elsevier, 2008, pp. 217-258.