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Crash Test Dummies to Welcome Virtual Relatives

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21 Oct 2008 , DETROIT : The crash test family is growing, in the virtual world that is. Today's crash test dummies made of rubber and steel will soon be joined by next-generation Human Body Models (HBMs) designed with precise detail, but living only in the world of computer-generated virtual reality. The HBMs were created through the Global Human Body Models Consortium, LLC (GHBMC), established in 2006, by a group of nine automotive manufacturers and two automotive system suppliers.

These next-generation HBMs are intended to help simulate human responses in automobile crashes. The HBMs will help researchers better predict the effect of trauma on the body than they have traditionally been able to do with crash test dummies. The new HBMs will even contain detailed representation of the bones and soft tissues of the human body, with special attention being directed to those parts that are frequently injured in vehicle crashes. Such advanced HBMs will support computer simulations such as virtual crash tests to help better understand human reactions and to improve automotive safety globally.

The GHBMC is composed of Chrysler LLC, Ford Motor Co., General Motors Corp., Honda R&D Co., Ltd., Hyundai Motor Co., Nissan Motor Co., Ltd., Renault s.a.s., PSA Peugeot-Citroën, Takata Corp., Toyota Motor Corporation and TRW Automotive Holdings Corp. The mission of the GHBMC is to create the world's most detailed computer models of the human body. Following

an in-depth request to more than 40 top research institutions, the GHBMC has now selected six teams made up of universities and research institutions from across the globe to collaborate with each other and GHBMC's members on this project. Six Centers of Expertise (COEs) have been formed and include a full body integration center together with five body region centers: head, neck, thorax/upper extremities, abdomen, and pelvis/lower extremities.

The GHBMC brings together research leaders in the field of injury biomechanics and computer modeling, collaborating to create models of the human to be recognized globally as being world standards for injury prediction. Additionally, the use of HBMs will enable better prediction of traumatic injury at detailed levels.

An integration center, or "Full Body Model COE", was established by the GHBMC at the Center for Injury Biomechanics of Wake Forest University, N.C.; working in collaboration with Hongik University of Korea, Virginia Tech. and the University of Michigan. The five designated body regions and their respective centers of expertise are:

Head and Brain COE; Wayne State University, Mich.

Neck COE; University of Waterloo, Canada

Thorax COE; (University of Virginia, supported by the European Center for Safety Studies and Risk Analysis (CEESAR), France and the University of Waterloo

Abdomen COE; The French National Institute for Transportation and Safety Research (INRETS) with joint performer Virginia Tech

Lower Extremities COE; University of Virginia supported by the University of Alabama in Birmingham, and the Indian Institute of Technology, Delhi, India

Automotive engineers, researchers, physicians and surgeons will collaborate and use state-of-the-art techniques to build this new family of human models. The models represent the computational evolution of crash safety evaluation tools and will be developed using medical imaging techniques including Magnetic

Resonance Imaging (MRI), Computerized Topography (CT) and laser surface scanning. Additionally, advanced engineering computing techniques are being employed, such as Computer Aided Design (CAD) and Finite Element Analysis (FEA), and the resulting models will be used to help evaluate the impact forces placed on the human body during traumatic events as a result of automotive crashes.

Models of four different sized individuals – two male and two female - will be created initially to begin covering the wide range of human body sizes. In future research, the GHBMC plans to expand the four initial models to represent other human body shapes, sizes and ages. Eventually, the GHBMC plans to create an extended family of virtual humans – from children to senior adults.

The GHBMC welcomes interest from potential members and others willing to help support and draw on their individual research and development activities in human body modeling as part of this single global effort to advance crash safety technology.

www.ghbmc.com

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