

# CAREsearch Day

## Some Thoughts on the Sensorimotor System in Health and Disease

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Dr. Krakauer is currently John C. Malone Professor of Neurology, Neuroscience, and Physical Medicine and Rehabilitation, and Director of the Brain, Learning, Animation, and Movement Lab ([www.BLAM-lab.org](http://www.BLAM-lab.org)) at The Johns Hopkins University School of Medicine.



His areas of research interest include: experimental and computational studies of motor control and motor learning in humans, tracking long-term motor skill learning and its relation to higher cognitive processes such as decision-making, prediction of motor recovery after stroke, mechanisms of spontaneous motor recovery after stroke in humans and in mouse models, and new neuro-rehabilitation approaches for patients in the first 3 months after stroke.

Dr. Krakauer is also co-founder of the video gaming company M<sup>2</sup>, and of the creative engineering Hopkins-based project named KATA. KATA and M<sup>2</sup> are both predicated on the idea that animal movement based on real physics is highly pleasurable and that this pleasure is hugely heightened when the animal movement is under the control of our own movements. A simulated dolphin and other cetaceans developed by KATA has led to a therapeutic game, interfaced with an FDA-approved 3D exoskeletal robot, which is being used in an ongoing multi-site rehabilitation trial for early stroke recovery. Dr. Krakauer's book, "Broken Movement: The Neurobiology of Motor Recovery after Stroke" was recently published by the MIT Press.

In the keynote lecture, the following topics will be discussed: (1) Motor planning and skill learning in healthy subjects, (2) the problem with stroke and basing neurorehabilitation on motor learning and (3) the interaction between training and plasticity early after stroke.