



## **2016 Brain Health and Performance Summit**

In May 2016, more than 200 physicians, scientists, technologists and entrepreneurs gathered in Columbus to discuss the latest findings in neuroscience, neurophysiology, and neurotechnology and how this research is having tangible impacts in a variety of ways including virtual reality, gaming, simulation, wearable sensors, assessment methods and a wide variety of new applications.

### **Breaking Barriers in Neuroscience**

The power of the brain to interface with technology is making it possible for people severely challenged by injury or disease to function more independently and accomplish feats they thought were impossible. This human and machine teamwork has allowed quadriplegic racecar driver Sam Schmidt to control his car with head movements that are converted into computer code. And Ian Burkhart, whose paralyzing spinal injury prevents him from performing many tasks of daily living, is now able to hold a phone to his ear and pour from a bottle thanks to a microchip embedded in his brain and connected to electrodes that stimulate his arm muscles. Researchers are working to make these and similar life-changing technologies more portable and wireless, as well as developing closed-loop systems that interface more seamlessly with individual users.

### **Keynote Presentation: The Sleep Revolution**

"Sleep is non-negotiable," says Arianna Huffington, President of the Huffington Post Media group. Discussing her book *The Sleep Revolution*, she cites scientific findings that sleep rejuvenates our bodies and brains and is a performance enhancer in all areas of our lives. Getting enough sleep improves our cognitive abilities, decision-making, judgment, creativity and resilience. And despite our societal belief that we should be available 24-7, making sleep a priority is the best path to productivity. Huffington asserts, "Your lives are too interesting to not be incomplete at the end of the day."

### **Optimizing Special Operations**

Research conducted using the Sense-Assess-Augment framework is supporting the training and operations of the most elite members of our United States armed forces. For example, researchers are able to assess stress levels in Special Operations forces using tools to measure brain function in a variety of real or simulated military situations. Their findings have the potential to not only enhance individual and team task performance, but to identify and help military personnel who are struggling with the effects of living and working in chronic high-pressure environments.

### **State-Of-The-Art Sense, Assess, and Augment**

Neuroscientific discoveries in personalized physiological computer modeling, targeted brain stimulation and biomarker sensor technology are providing highly sophisticated data about our bodies and brains. “Virtual brain” technology also helps researchers study brain activity, and in addition engages the public in neuroscientific topics. Practitioners can use information from these technologies to make decisions about the best treatment options, and researchers are able to measure and evaluate brain activity and possible neuromodulation in previously unimagined ways.

### **Taking Care of Your Brain: Fact and Fiction**

In studies of optimal aging and diseases such as Alzheimer’s, science is showing that we have the potential to positively impact our brain function even in older age. Prioritizing good nutrition, aerobic exercise and regular social engagement seem to influence whether and when some individuals develop conditions associated with aging. And there is also evidence that we can develop a “cognitive reserve,” influenced by factors such as education, that may increase brain neuroplasticity and make us less susceptible to the effects of brain changes that can be signals of cognitive decline.

### **Virtual Reality, Neurogaming and Simulation**

Brain researchers are harnessing space-age technologies to create personalized therapies and treatments. For example, avatar science is helping people deal with chronic pain. Video games that function as “body-brain trainers” stimulate neural networks to improve conditions such as ADHD, depression and autism. And virtual reality simulation creates immersive scenarios so military personnel can learn to manage stress in chaotic, war-like conditions. These rapidly evolving, engaging technological tools are also enhancing knowledge of healthy brain performance.

## **Speakers**

### **Arianna Huffington**

Founder of The Huffington Post  
Founder and CEO of Thrive Global

Arianna Huffington is the founder of The Huffington Post, the founder and CEO of Thrive Global, and the author of 15 books, including, most recently, Thrive and The Sleep Revolution.

In May 2005, she launched The Huffington Post, a news and blog site that quickly became one of the most widely-read, linked to, and frequently-cited media brands on the Internet, and in 2012 won a Pulitzer Prize for national reporting. In August 2016, she launched Thrive Global, a corporate and consumer well-being and productivity platform with the mission of changing the way we work and live by ending the collective delusion that burnout is the price we must pay for success. Thrive Global provides trainings, seminars, e-courses, coaching and ongoing support based on the latest scientific findings to improve people's health and increase productivity for both companies and individuals around the world.

She has been named to Time Magazine's list of the world's 100 most influential people and the Forbes Most Powerful Women list. Originally from Greece, she moved to England when she was 16 and graduated from Cambridge University with an M.A. in economics. At 21, she became president of the famed debating society, the Cambridge Union.

She serves on numerous boards, including Uber and The Center for Public Integrity.

Her last two books, Thrive: The Third Metric to Redefining Success and Creating a Life of Well-Being, Wisdom, and Wonder and The Sleep Revolution: Transforming Your Life, One Night At A Time, on the science, history and mystery of sleep, both became instant international bestsellers.

## **Adam Gazzaley**

University of California, San Francisco

Director, Neuroscience Imaging Center

Adam Gazzaley, MD, PhD, obtained an MD and a PhD in Neuroscience at the Mount Sinai School of Medicine in New York, completed clinical residency in Neurology at the University of Pennsylvania, and postdoctoral training in cognitive neuroscience at UC Berkeley. He is now Professor in Neurology, Physiology and Psychiatry at the UC San Francisco, the Founding Director of the Neuroscience Imaging Center, and Director of the Gazzaley Lab, a cognitive neuroscience laboratory.

His laboratory studies neural mechanisms of perception, attention and memory, with an emphasis on the impact of distraction and multitasking on these abilities. His unique research approach utilizes a powerful combination of human neurophysiological tools, including functional magnetic resonance imaging (fMRI), electroencephalography (EEG) and transcranial magnetic and electrical stimulation (TMS & TES). A major accomplishment of his research has been to expand our understanding of alterations in the aging brain that lead to cognitive decline. His most recent studies explore neuroplasticity and how we can optimize our cognitive abilities via engagement with custom-designed video games, and how this can be bolstered by closed loop systems using neurofeedback and TES.

Dr. Gazzaley is co-founder and Chief Science Advisor of Akili Interactive, a company developing therapeutic video games, and is also a co-founder and Chief Scientist of JAZZ Venture Partners, a venture capital firm investing in experiential technology to improve human performance. Additionally, he is a scientific advisor for over a dozen technology companies including GE and Nielsen. Dr. Gazzaley has filed multiple patents for his

inventions, authored over 110 scientific articles, and delivered over 450 invited presentations around the world.

His research and perspectives have been consistently profiled in high-impact media, such as The New York Times, New York Times Magazine, New Yorker, Wall Street Journal, TIME, Discover, Wired, PBS, NPR, CNN and NBC Nightly News. He wrote and hosted the nationally televised, PBS special "The Distracted Mind with Dr. Adam Gazzaley". Dr. Gazzaley has received many awards and honors, most recently the 2015 Society for Neuroscience – Science Educator Award.

### **Olaf Blanke, MD, PhD**

Brain-Mind Institute, Ecole Polytechnique Fédérale de Lausanne (EPFL)  
Laboratory of Cognitive Neuroscience  
Switzerland

Olaf Blanke, MD, PhD, is founding director of the Center for Neuroprosthetics and Bertarelli Foundation Chair in Cognitive Neuroprosthetics at the Ecole Polytechnique Fédérale de Lausanne (EPFL). He also directs the Laboratory of Cognitive Neuroscience at EPFL and is Professor of Neurology at Geneva University Hospital and Geneva's new Campus Biotech.

Blanke has made major contributions to the neuroscience of multisensory perception, embodiment and self-consciousness with broad impact beyond neuroscience, in psychology, philosophy, neurology and engineering. Most recently, Dr. Blanke has pioneered the development of cognetics by integrating technologies from robotics, virtual reality, and neuroscience. His medical activities (cogniceuticals) are dedicated to the application of these neurotechnological breakthroughs to novel diagnostics and therapeutics in orthopaedic, neurological, psychiatric, and respiratory disease.

### **Miles O'Brien**

PBS NewsHour  
Science Correspondent

Miles O'Brien is veteran, independent journalist who focuses on science, technology and aerospace. He is a producer and correspondent for the PBS NewsHour, a producer and director for the PBS science documentary series NOVA, a correspondent for the PBS documentary series FRONTLINE, the National Science Foundation Science Nation series, and also serves as an aviation analyst for CNN.

For nearly seventeen of his thirty-two years in the news business, he was a staff correspondent and anchor with CNN based in Atlanta and New York. He served as the science, environment and aerospace space correspondent and the anchor of various programs, including American Morning. While at CNN, O'Brien secured a deal with NASA to become the first journalist to fly on the space shuttle. The project ended with the loss of Columbia and her crew in 2003 – a story he told to the world in a critically acclaimed sixteen-hour marathon of live coverage. He is currently an at large member of the NASA advisory Council, offering strategic advice to the NASA administrator. Prior to joining CNN, he worked as a reporter at television stations in Boston, Tampa, Albany, NY and St. Joseph, MO. He began his television career as a desk assistant at WRC-TV in Washington, DC. O'Brien is an accomplished pilot and is frequently called upon to explain the world of aviation to a mass audience.

He has won numerous awards over the years, including a half-dozen Emmys, a Peabody and DuPont for his coverage of Hurricane Katrina and its aftermath. In February of 2014, a heavy equipment case fell on his forearm while he was on assignment in Asia. He developed Acute Compartment Syndrome, which necessitated the emergency amputation of his left arm above the elbow. Despite the loss of his arm, remains an avid cyclist, runner, and has begun the training required to regain his medical qualification to be a private pilot. Born in Detroit and raised in Grosse Pointe Farms, MI, he is based in Washington, DC. He has a son at the US Naval Academy and a daughter at Davidson College in North Carolina. He was a history major at Georgetown University.