Colonial Medicine
"Revolutionary Solutions"

Interdisciplinary collaboration between engineering, mathematics and science ...

SEMS Research Highlights

RMU Biomedical Engineers Design Concussion Detection System for Grade School Athletes!

Benjamin Campbell, Ph.D. Denise Ramponi, D.N.P
Students L-R: Dan Mignogna, Derrick Wells, Alexandra Deines, Stephanie Abbott, Margaret Harden and Alicia Ericson

This newsletter presents the research conducted within the School of Engineering, Mathematics and Science (SEMS) at Robert Morris University (RMU). It covers various relevant topics including: interdisciplinary efforts, successful research grants, student research, posters and papers, journal publications, presentations at national and international conferences, contribution to professional societies, STEM educational research, industrial consulting collaborations and applied research.

Dr. Benjamin (Ben) Campbell, RMU Assistant Professor of Engineering, was awarded $6500 by the Coulter Foundation to cover the cost of travel for him and a team of six students to Seattle to participate in an engineering workshop. Dr. Campbell partnered with RMU Assistant Professor of Nursing, Denise R. Ramponi, as the team clinician. The team decided to design an improved concussion assessment system. They named their team *Colonial Medicine* and designed the "β-smart Concussion Detection System," A unique combination of hardware and software to portably diagnose both cognitive and physical symptoms of concussion for grade school athletes. They identified specifications for the device including: porta-bility for field use, cheat proof, usable by non-medical personnel, less than five minutes to conduct the test, and reliable for ages ten and up. Their device consisted of a combination of cognitive tests coupled with biometric assessment data using a low cost EEG headset for monitoring β-waves in the brain with the capabilities existing on a smart phone or tablet to record user responses to physical and mental tests. This system improves on the current standard for athletic concussion assessment by adding a range of physical biometric data for diagnosis. The team is preparing a paper based on their design and will potentially reach out to the current concussion testing companies to collaborate on further development of their ideas.
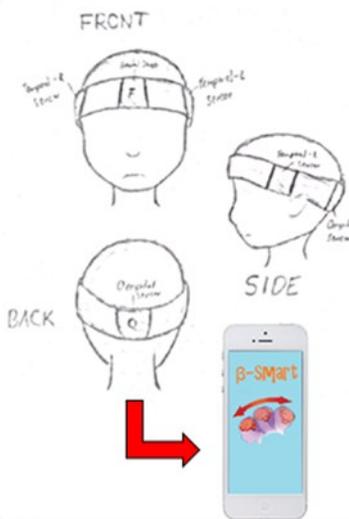
Conceptual Design of β-Smart Concussion Detection System

RMU ROBERT MORRIS