A. Grants

A.1. Active Grants

Seong K. Mun, “Electronic Health Record Open Source Custodial Agent”
$148,262; Department of Veterans Affairs (subcontract from TIAG, Inc.)
10-Oct-2011 to 19-Jun-2012

The Department of Veterans Affairs (VA) is developing an electronic health record (EHR) Open Source ecosystem facilitated and guided by a central body, the EHR Custodial Agent (CA). Dr. Mun will provide technical leadership and coordination of the program activities of the newly formed CA.

Seong K. Mun and Kenneth H. Wong, “Neuroperformance Imaging”
$1,498,000; U.S. Army Contract W23RYX1089N603
1-May-2011 to 19-Sept-2012

This project is a collaborative effort between Virginia Tech, Washington University in St. Louis, and Gachon University in South Korea. The project focuses on the role of sleep in neuroperformance, with particular emphasis on (1) PET/MRI studies to understand dopamine, acetylcholine, and serotonin sleep regulatory systems in the brain, particularly in the brainstem and thalamus; (2) EEG/fMRI studies focusing on the functional connectivity of networks between the thalamus and cortex that control the descent into sleep and are altered by sleep deprivation; (3) Development of reference image databases for high field MRI studies of the brain. We have requested a one-year no-cost extension.

A.2. Pending Grant Applications

Alpay Özcan, “Computer Aided Diagnostics and Staging for Prostate Cancer via MRI Feature Space as a Biomarker”
$583,453; Department of the Army
23-Sept-2013 to 22-Sept-2016

In this project, a novel approach based on a joint, direct and objective visualization and analysis of data is proposed to improve prostate cancer localization, evaluation and staging.
It employs MRI due to its widespread clinical usage and its ability to measure highly relevant tissue properties like microstructure and vascularization for prostate cancer diagnosis. This improved imaging technique will give physicians the capability to investigate prostate areas with similar biological properties at one instance. The separation of benign-malign tissue, and the increase of localization accuracy will result in the improvement of the diagnosis, better guidance of focal therapy and prognosis.

Seong K. Mun and Kenneth H. Wong, “Rugged Medic Smartphone”
$2,115,264; Department of the Army
30-Sep-2012 to 29-Sep-2015

We proposed to design and build a rugged medic smartphone that will have capabilities above and beyond existing physiological monitoring systems, but in a much smaller package and with a familiar smartphone based user interface. The result will be a compact handheld device that can enhance the capabilities of field medics to fulfill their critical missions, while also being able to allow for telementoring and the recording/transmission of important patient data to aid stations, hospitals, and other medical facilities.

Seong K. Mun, “Open Source Electronic Health Record Agent”
$173,225; Veterans Affairs/Ray Group International
15-Jun-2012 to 14-Dec-2012

As a continuation of a previous grant with Virginia Tech, the Department of Veterans Affairs (VA) is developing an electronic health record (EHR) Open Source ecosystem facilitated and guided by a central body, the EHR Custodial Agent (CA). Dr. Mun will provide technical leadership and coordination of the program activities of the newly formed CA.

**A.3. Completed Grants**

$358,742; U.S. Army Contract W81XWH-08-2-0173
30-Sep-2010 to 30-Nov-2011

AIC convened a workshop of invited experts on the topic of Patient Centered Medical Home, focusing on technology, implementation, and lessons learned from the civilian and military sectors. AIC then disseminated workshop findings through articles written for peer-reviewed journals.

Through the Intergovernmental Personnel Act Mobility program, Willie E. Wright was detailed to the Telemedicine & Advanced Technology Research Center (TATRC) as a network security engineer. TATRC performs medical reconnaissance and special
operations to address critical gaps that are underrepresented in DoD medical research programs.

Seong K. Mun, “Neuroscience and Human Performance”
$225,848; U.S. Army Contract W81XWH-10-2-0153
30-Sep-2010 to 29-Oct-2011

AIC convened a workshop of invited experts in the field of neuroperformance, focusing particularly on the application of imaging technologies. Develop reference materials and guidance documents for the Army, in addition to published reports from the workshop.

Kenneth H. Wong, “Imperium Acoustocam Clinical Testing”
$185,000
01-Jun-2010 to 28-Feb-2012

Technical and clinical testing of a novel ultrasound camera for evaluation of bone fractures and detection of foreign matter embedded under skin.

B. Publications


Alpay Özcan, James D. Quirk, Yong Wang, Qing Wang, Peng Sun, William M. Spees and Sheng--Kwei Song, The Validation of Complete Fourier Direct MR Method for Diffusion MRI via Biological and Numerical Phantoms, pp.3756-3759, 33rd Annual International Conference of the IEEE EMBS, Boston, Massachusetts USA, August 30 - September 3, 2011

Jeanine Turner, James D. Robinson, Yan Tian, Alan Neustadtl, Pam Angelus, Marie Russell, Seong K. Mun, Betty Levine: Can Messages Make a Difference? Association between E-mail Messages and Health Outcomes in Diabetes Patients, Human Communication Research Journal. Accepted for publication.

C. Workshops

Study of Neuro-Stress with MRI Tractography and PET Imaging, February 16-17, 2012, Gachon University, Incheon, Korea.

AIC and Gachon University’s Neuroscience Research Institute cohosted an invitation-only workshop in Incheon, Korea. The workshop examined the potential of macro-connectomics inferred from tractography methods as an aid for the identification of those individuals at
greatest risk for deleterious outcomes, for the development of effective treatment strategies and in the evaluation of the efficacy of interventions. Additional discussion focused on the importance of multi-modal neuroimaging and functional imaging in determining the interactions between anatomical connectivity and pathologies, including the role of high resolution MRI, functional MRI (fMRI), high resolution research tomograph (HRRT) positron emission tomography (PET) and electroencephalography (EEG).

D. Educational Activity

D.1. Biomedical Technology Development and Management (BTDM)

Two students graduated from the program in Spring 2012. One is employed at a diagnostics firm in the area and the second has been accepted into PhD studies at a nearby university. We are on track to admit 2-3 new students for the Fall 2012 semester.

With the departure of Georgetown University from the program, we have undertaken a complete overhaul of all the courses in the program and will be submitting many new and revised courses through governance during the fall. This fall, we are piloting a new course in medical imaging and physics, which will also be offered to physics undergraduate and graduate students. The current structure of the BTDM program will also be changing as we are moving away from a weekend-only format in order to make classes more accessible to a wider audience of students. We are also exploring the possibility of tapping into other classes at the university (particularly those taught in Blacksburg) through distance learning technology.

We are still seeking recognition from the Professional Science Masters association. Part of the limitation is that we do not have a formal advisory board that can demonstrate a history of placing students in internships. This should improve over time.

We have been closely examining the financial model of the program in conjunction with central finance staff, because the high differential tuition is a disincentive for people to seek us out. Our goal is to be able to offer the program at a cost close to standard tuition, with some small added fee to cover costs such as food for long weekend classes.

We are also working with local representatives from Continuing and Professional Education to make some of our class content available in non-degree programs.

D.2. Outreach/Talks

Alpay Özcan, invited Speaker, McLean Hospital, Harvard Medical School, Belmont MA, Neuroscience Seminar Series, June 2012

E. Key Strategic Development Activities for the Next Year:

- MedicPhone consortium involving Samsung Electronics of Korea
- Expansion of Neuroscience Activities
- Expansion of Graduate Program for Biotechnology
- Cyber Security of Biomedical Devices