

QUEST - QUalia Exploitation of Sensors - Can we make a computer that can feel?

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Abstract

The Air Force Research Laboratory Sensors and Information Directorates Qualia Exploitation of Sensor Technology (QUEST) Initiative is presented. The initiative is developing a universal exploitation approach applicable to anticipating, detecting, distinguishing and characterizing threats from IEDs to malicious code to breast cancer.

Biographical Sketch

Dr. Steven K. Rogers is the Senior Scientist for Automatic Target Recognition and Sensor Fusion, Air Force Research Laboratory, Air Force Materiel Command, Wright-Patterson AFB, OH. Dr. Rogers serves as the principal scientific authority and independent researcher in the field of multi-sensor automatic target recognition (ATR) and sensor fusion. Dr. Rogers initiates, technically plans, coordinates, evaluates, and con-

ducts research and development to advance the knowledge of interdisciplinary ATR and sensor fusion systems for all Air Force aircraft, missile and space systems. Dr Rogers leads collaboration across AFRL in object detection, tracking, geo-location, identification and supporting technologies. He also conducts research and development activities in the broad area of ATR and sensor fusion technology including phenomenology modeling, model-based and learning algorithms, evaluation and tracking. Dr. Rogers also conducts R/D in image and signal processing, synthetic target and scene modeling, resource allocation and evidence accrual aimed at decreasing the cost and improving the performance of AF/DoD systems.

Dr. Rogers has had an extensive career in both government service and civilian industry. He retired from active duty in the AF after 20 years service. His active duty assignments included being a flight line enlisted Logistics specialist at Peterson AFB Colorado. He was chosen for the Airman Education and Commissioning Program and received his commission and was assigned to WPAFB as a Second Lieutenant in the Aeronautical Systems Division. Among his tasks were being the ASD focal point for the development of a new High Order Programming Language, DOD-1, Ada, and performing Signal Processing and Data Analysis for the base laboratories. Dr. Rogers was then selected to attend the Air Force Institute of Technology and received a Masters Degree in Electrical Engineering, Electro-Optics. His Masters Thesis was chosen the most outstanding thesis for which he received the Commandants Award. He was selected to attend the University of Colorado and received his PhD and returned to AFIT as a Professor in the Electrical and Computer Engineering Department.

Dr. Rogers served as a Professor at AFIT for over a decade. While at AFIT he directed research efforts in areas that included identification of targets in a variety of sensors (Laser Radar, EO, FLIR, SAR, Hyperspectral, . . .). He also did ground breaking work in learning algorithms and was elected to be a Fellow of both the IEEE and SPIE. Dr. Rogers received the USAF Research and Development Award. He was chosen to be the organizing chair the first IEEE World Conference on Computational Intelligence and chosen as the Ple-

nary Speaker for two WCCIs. Dr. Rogers also chaired a very successful series of conferences for SPIE on the Applications and Science of Artificial Neural Networks.

As Founder/President/CEO/Chief Scientist of Qualia Computing, Inc., then CADx Systems and then iCAD, Inc., Dr. Rogers led the effort to bring intelligent information processing to women's health care. From the fundamental premise that evidence based medicine is the future he grew the company from a couple of engineers around his kitchen table to over 120 people and a \$175M market cap. Under his direction the company not only became the leader in mammography CAD it also developed a multi-modality CAD platform to facilitate the quick and efficient application of the technology to many medical detection problems. He was the primary driver of iCAD's research and development activities. Dr. Rogers also has worked on developing practical applications of advanced information processing techniques for other medical products. Among his work is research into prostate cancer prognosis using imaging and proteomic/genetic signatures, cardiovascular monitoring during exercise for early detection of coronary artery disease, and feedback control medicine that allows customization of current medical practice to account for an individual patient's response to standard therapy. He has authored several hundred publications and awarded 14 patents.