Workshop Summary

The 2005 AIPR Workshop held at the Cosmos Club Oct. 19-21 brought together many researchers from government, industry, and academia to discuss their imaging and pattern recognition techniques with the theme of multi-modal applications. In a cross disciplinary manner, a common theme was the interrelationship between imagery products and the direct relevance of physics-based modeling and reconstruction to the development of both multiple modes and high dimensionality for pattern recognition applications. This theme was explored in homeland defense and military imagery as well as biomedical and commercial applications.

The workshop was opened on Wednesday by Dr. Michael C. Wicks, Acting Chief Scientist of the Air Force Research Lab, Sensors Directorate discussing narrowband tomography. This talk described how spatial diversity, frequency diversity, and waveform diversity can be used to improve the dimensionality and quality of the imagery products for remote sensing applications. This session was followed by the session on homeland defense chaired by Trent DePersia of the Department of Homeland Security, Pete Costianes of the Air Force Research Laboratory, Information Directorate, and a session by Neelam Gupta of the Army Research Laboratory, Adelphi Maryland on military imagery applications. Discussed were concealed weapons detection techniques in the terahertz regime, through the wall imaging at low microwave frequency bands as well as electromagnetic inversion methods for imagery formation and hyperspectral imaging methods for increased pattern recognition diversity.

Thursday featured biomedical applications with a session chaired by Professor Birsen Yazici of Rensselaer Polytechnic Institute and Professor Murray Loew of George Washington University. The session also included an outstanding talk by distinguished Professor Britton Chance of the University of Pennsylvania on optical brain imaging techniques for mood detection. This talk explored the possibility of remote lie detection using blood flow analysis in external cortical regions of a subject and has since been nationally recognized by major technology magazines. Related optical biomedical imaging techniques included those presented by industry for cancer detection and combinations with magnetic resonance imaging modalities. These sessions were followed by those in automatic target recognition chaired by Charles Cohen of Cybernet Corporation of Ann Arbor Michigan continuing the theme of physics based imaging methodologies.

At the AIPR banquet on Wednesday evening was a poster session displaying infrared camera technologies by Carlos Maraviglia of the Naval Research Laboratory in Washington DC followed by an outstanding talk by Professor Alexander Levis of George Mason University, former Chief Scientist of the Air Force on system design for wide scale integration. Finally Professor David Schaefer of George Mason University chaired a session on modeling of physical phenomena in multimodality fusion for the successful conclusion of the conference on Friday. I would like to thank all those who participated in the conference and those on the AIPR Executive Committee who assisted in putting it together including the General Chair Dr. Al Williams of the Naval Research Laboratory and our host at the Cosmos Club, Mr. Don Gerson of Gerson Imaging Solutions. The contents of this proceedings will hopefully be a valuable resource to all those wishing to show how physical imaging and multi-modal applications improve the state of the art in automatic pattern recognition.