

## **DR. R.H. COFER**

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Dr. Cofer is a full-time member of the faculty of the Florida Institute of Technology and has previously served on its graduate school adjunct faculty for almost 17 years while working in the local defense community in the area of Image Processing and Remote Sensing. His current research activities center on Open Source coding of Remote Sensing software for international use in environment sensing and other activities are described at: <http://www.remotesensing.org> In support, he has recently setup Florida Tech's Applied Perception Lab, with more than 3 BS, 7 MS and 3 Ph.D. students supporting its activities. Already another professor has become affiliated with the lab and internationally others are considering affiliation including from the Budapest University of Technology and Economics.

At Florida Tech, Dr. Cofer has been very actively solidifying the ability of drawing out ground environmental and cultural features from remote sensing imagery in our graduate image processing and pattern recognition classes and as a Ph.D. research advisor. As a result of his continuing individual research, he holds very deep theoretical views of high performance remote sensing theory, the signal characteristics of environmental imagery and the required trades to achieve better robustness and computational efficiency of algorithmic environmental sensing.

Dr. Cofer has had extensive experience with all forms of imaging technology for remote sensing for environmental concerns and other objectives. Forms of imagery considered include E-O, IR, LADAR, Hyperspectral and SAR. Two of his recently graduated Ph.D. students are with the advanced technology section of the JSTARS program of Northrup-Grumman. During their Ph.D. research period, they conducted SAR imaging of ground features near Hungary. This SAR imaging has the unique environmental advantage of being able to work through clouds and at night for increased availability. Additionally, Dr. Cofer's has lead a busy consulting practice with other local members of the remote sensing community include development of fractal based techniques for image enhancement of the remotely sensed environment as well as a next generation high performance Image Formation Processing platform for remote sensing.

Earlier, Dr. Cofer's has twice been Visiting Summer Professor in closely related ATR research at WL/AARA and via following research contracts. He is quite familiar with both national and tactical image processing and recognition problems and is dedicated to a rigorously defensible approach toward design of high performance robust environmental data collection systems. Dr. Cofer also continues to consult for Harris Corp. in imagery processing and ATR, where earlier he was a Senior Principal Engineer on the staff of the Government Information Systems Division. There he was engaged in SAR imagery bandwidth reduction technology and the minimization of its effects on photogrammetric and mensuration activities. Dr. Cofer has also developed the technical image quality budgeting for a large panoramic mapping quality camera system capable of serious environmental sensing and the detailed image quality analysis for a hybrid Cosine-DPCM digital bandwidth compressor chip set. Others technical studies include an entire TELAN, ITAS, Micro-ITAS, IPPAU, Macro-IPPAU and HYPASAS sequence of AI-precursor smart analysis assistant aids adaptable to addressing many environmental issues.

### **SELECTED RECENT PUBLICATIONS**

- Cofer and S. P. Kozaitis, "Probabilistic IR modeling for Bayesian automatic object recognition," Automatic Target Recognition III, F. A. Sadjadi, Ed., Proc. SPIE 1960-21 (1993).

- Cofer, “Bayesian defeat of camouflage,” Characterization, Propagation, and Simulation of Sources and Backgrounds II, D. Clement and W. R. Watkins, Eds., Proc. SPIE 1687-50 (1992).
- Cofer, “Probability modeling in ATR,” Final Report, USAF-UES Research Initiation program, 1991.
- Cofer, “Model based Bayesian target recognition,” Final Report, USAF-UES Summer Faculty Research program, 1990.

**Proposed CUAP Research Area:** *Remote Sensing Software for Environmental Monitoring in Hungary.* This component of the overall CUAP proposal addresses Hungary’s urgent need for specialized access to remote sensing data to begin allowing timely and accurate pollution monitoring and environmental resource management. The need for such remote environmental monitoring was underscored during the recent October 25, 2000 Joint Workshop in Cologne, Germany between the Applied Perception Lab (APL) of Florida Institute of Technology, the Department of Control Engineering and Information Technology of the Budapest University of Technology and Economics (BUTE), the GMD of Germany, and the host company Orgalagic, a transatlantic corporation with ties to Hungary. Of various modes of cooperation discussed, Prof. Laszlo Vajta, department head at the BUTE iterated the need for rapid ramp-up in remote sensing technology and their university’s desire to participate in such programs. Florida Tech presented details of our complementary ongoing funded remote sensing program and research in the international open sourcing of remote sensing software being conducted via the web site, <http://www.remotesensing.org/>. Prof. Vajta of BUTE expressed a strong desire to build on this and begin joint cooperation toward developing and adapting this open source remote environmental sensing software to the needs of Hungary.

While much of the development and adaptation of our remote sensing software can be accomplished over the Internet, the effort will be greatly enhanced by semiannual meetings of the research principles of BUTE and Florida Institute of Technology and possible student and professor exchanges.

*First year activity:* one technical exchange trip to determine specific research goals and mechanisms of supporting personnel exchanges.

*Second & third year activities:* CUAP budget requirements would be defrayment of one round trip/yr. between Hungary and Florida Institute of Technology to assist other funding currently being sought to cover the overall costs of personnel exchange. Supporting proposals are anticipated being written to Orgalagic and others, including European partners, in the near future.