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ERDC-TEC Researchers Receive Patent

The reduction of errors and distortions in digital remotely sensed imagery is of primary interest to the photogrammetric community. Errors are introduced at every stage in the process, from the differing characteristics of the sensor, optical system, atmosphere, and illumination of the geographic area that is imaged. The latter group of errors is the focus of a recent U.S. patent issued to Dr. Henry Berger and Mr. Edward H. Bosch of the U.S. Army Engineer Research and Development Center's (ERDC), Topographic Engineering Center, Alexandria, Va. Application of this patent will allow for the reduction of errors introduced through sensor illumination of the target area.

There is a certain class of errors introduced into imaging that has nothing to do with the equipment used to image. Rather, it has to do with the processing of that information as individual pixels with an assumed average intensity of illumination falling thereon, an assumption that is not conducive to accurate imaging of real-world scenes. Dr. Berger and Mr. Bosch have devised a clever mathematical manipulation during data processing that provides a much better image by eliminating this averaging at the individual pixel level. It has applications wherever a "clear picture" is needed, e.g., collecting intelligence at a distance above the earth,

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high definition TV, and imaging inside the body. The imaging may be done with traditional photography, IR or UV photography, active laser, radar, or sonically. For any imaging method, the Berger-Bosch process improves image accuracy, even from the most sophisticated imaging system configurations.

Dr. Berger holds a doctorate in electrophysics from the Polytechnic University (formerly the Polytechnic Institute of Brooklyn). He has postgraduate experience in government, university-linked and industrial research and research and development, project management, and part-time teaching of advance mathematics at the university level. Mr. Bosch is a Ph. D. candidate in computational mathematics at George Mason University, Fairfax, Va. He develops mathematical models for the exploitation of multi-source digital imagery including, feature extraction, pattern recognition, dimension reduction, compression and classification.

The ERDC is the premier research and development facility for the Corps of Engineers. It consists of seven laboratories at four geographical sites, with more than 2,000 employees, \$1.2 billion in facilities, and an annual research program exceeding \$570 million. It conducts research in both military and civil works mission areas for the Department of Defense and the nation. Its primary mission areas include military engineering, battlespace environment, facilities and infrastructure, environmental quality, and water resources.