

Hyperspectral Eyeing of Heavenly Bodies – a Machine Intelligence Approach

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Erzsébet Merényi (<http://www.ece.rice.edu/~erzsebet>) earned an MS in mathematics (1975) and PhD in computational science (1980) from Szeged (Attila József) University, Hungary. She is a research professor in the Electrical and Computer Engineering Department of Rice University, Houston, Texas. She was formerly a staff scientist at the Lunar and Planetary Laboratory, University of Arizona, and a research associate in the Cosmic Physics Department at the Central Research Institute for Physics of the Hungarian Academy of Sciences. She worked on numerical modeling of charged particle transfer in the Heliosphere (1980–1990), and on analyzing images of the nucleus of P/Halley from the (then) Russian Vega mission. Her mathematical custom restorations of the severely corrupted, once-in-a-lifetime images were published by the European Space Agency, and are in international archives (PDS, IHW).

From 1991 Erzsébet has been focusing on analyzing spectral data for resource mapping and knowledge discovery from space missions and terrestrial remote sensing projects, including data from Clementine, the Imager for Mars Pathfinder, the Mars Exploration Rovers, telescopic measurements, and airborne hyperspectral sensors such as AVIRIS. Most recently she has been collaborating on inference of latent parameters (such as surface temperature and grain size) from high-resolution spectra, in preparation for the Pluto-Charon encounter by the New Horizon mission.

Her overarching research interest is in neural machine intelligence for manifold learning, structure discovery and precise classification, in complex, high-dimensional, highly structured data such as hyperspectral imagery and medical data. Her research has been funded by several NASA programs, and by the Baylor College of Medicine. At Rice she also co-leads the machine learning effort in a large DARPA – Rice compiler development effort.