LSGI Distinguished Lecture Series

Recent Progress in Image-based Planetary Remote Sensing

Date: 27 February 2019 (Wed)
Time: 3:00pm – 4:00pm
Venue: ZN604, Block Z, PolyU
Language: English

Prof. Christian Wöhler
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Biography

Prof. Christian Wöhler received his Diplom (equiv. to M.Sc.) in Physics from Würzburg University in 1996, the Doctorate degree in Computer Science from Bonn University in 2000, and the Habilitation (Venia Legendi) in Applied Computer Science from Bielefeld University in 2009. From 1997 to 1999 he worked as a PhD student and from 2000 to 2010 as a senior research scientist in the Environment Perception department of Daimler Group Research and Advanced Engineering in Ulm. From 2005 to 2010, he was a visiting lecturer at the Faculty of Technology of Bielefeld University. Since 2010, he is professor of image analysis at the Faculty of Electrical Engineering and Information Technology of Dortmund University of Technology. His main scientific interests are in remote sensing, photogrammetry and computer vision, with applications in the fields of planetary science and exploration as well as in the industrial domain.

Recent Progress in Image-based Planetary Remote Sensing

An important aspect of planetary remote sensing is the analysis of large volumes of image data commonly acquired across a broad spectral range. The first part of the talk describes the image-based construction of highest-resolution topographic maps of high vertical accuracy, relying on a combination of the concepts of photogrammetric stereo image analysis or laser altimetry with photometric stereo and shape from shading techniques. Results recently obtained for areas of the Moon and Mars are presented. In the second part, a methodical framework for the analysis of infrared hyperspectral image data of atmosphereless bodies, e.g., the Moon and Mercury, is outlined, focusing on the distinction between the solar radiation reflected from the surface and the thermal emission component. In particular, spacecraft observations of the lunar 3-µm absorption band commonly attributed to hydroxyl/water on the surface of the Moon are considered. The talk concludes with an overview of machine learning techniques applicable to planetary remote sensing tasks. Applications of these methods to the analysis of statistical relationships between remote sensing data acquired in different wavelength ranges, e.g., infrared vs. gamma-ray spectral data, and to the fully or partially automated search for geomorphologic structures in huge volumes of spacecraft image data are discussed.

All are WELCOME!

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