DISTINGUISHED LECTURE SERIES

Image Understanding and Deep Learning for Climate Change Monitoring, the Green Transition and Lunar and Mars exploration

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Y301, BLOCK Y, POLYU

ENGLISH

Prof. Jan-Peter Muller

Emeritus Professor of Image Understanding and Remote Sensing at University College London (UCL)

ABSTRACT

Research over the last 40 years has addressed many of the basic algorithmic issues to ensure that all pixels on a surface are corrected for relief distortions and atmospheric scattering effects and are coregistered over time and in some cases corrected for BRDF effects. Labelling what land use land cover type is on the surface remains a significant challenge as well as interpretation of how this surface changes over time. Spacecraft telecoms bandwidth significantly affects the optoelectronic design of remote sensing instruments and vice versa. One way of addressing this is through the use of single-image super-resolution restoration (SISR) either applied to a sub-image onboard in real-time or to the downlinked data. Single image height estimation through deep learning has recently been developed, examples will be shown from Mars and the Moon and an analysis on Earth of Meta-WRI tree canopy heights.

BIOGRAPHY

Emeritus Professor Jan-Peter Muller of the Mullard Space Science Laboratory within the Department of Space and Climate Physics at UCL developed several operational remote sensing algorithms for the production and validation of global NASA datasets (e.g. MODIS albedo & MISR 3D winds). He joined the academic staff of the UCL Department of Photogrammetry and Surveying from 1984-2006 where he developed the world's first fully automated 3D modelling system based initially on the SPOT satellite using machine vision to replace manual photogrammetric measurements in 1988. This was later extended to multiple platforms and released through an open source system, CASP-GO in 2021 within the NASA Ames Stereo Pipeline (ASP) where this automated feature was used to create a 12m DEM for around 30% of the Martian surface. He was chair of the ISPRS WGIV/1 on "Extra-terrestrial Mapping" from 1996-2004 and the CEOS WGCV Terrain mapping from satellites sub-group from 2001-2014 where he developed a mathematical framework for DEM validation and global validation sites.

Moderator: Prof. Bo Wu, Associate Head, LSGI

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