

CELEBRATING  
COMMERCIALISATION  
YEAR 2014

# iiindex 2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

invention  
innovation  
& design  
exposition 2014

INNOVATEUR  
wannabe!  
2014

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UNIVERSITI TEKNOLOGI MARA  
MALAYSIA

*Bridging  
the valley of death :  
advancing the  
commercialisation  
of research*

RESEARCH BOOK

# iiindex2014

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innovation  
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## FOREWORD

The Honourable Minister of Science, Technology and Innovation (MOSTI) has launched 2014 as Malaysia Commercialisation Year 2014 (MCY2014) with the theme Science Technology and Innovation (STI) for Wealth Creation. In line with this theme, Invention, Innovation, Design & Exposition 2014 (iidex2014) is an annual exposition organized by UiTM and is the ultimate platform to highlight and commercialise new inventions and innovations. Researchers and inventors will exhibit their products which cater to the needs and wants of the community and the country.

The iidex2014 creates a new dimension by fusing two competitive concepts, a competition among innovative products and a competition to invite Innovateur Wannabes to perform live pitching of their products to the audience. The iidex2014 focuses on comprehensive commercialization and creating opportunities for entrepreneurs to carry out R&D as well as to provide avenue to commercialise their products. Through expositions such as iidex2014, MOSTI hopes to inculcate the culture of commercialisation of new technology designed and created by Malaysians.

I wish to congratulate all the participants of the iidex2014 and this is the opportunity for all researchers to show their ideas and exhibits their products and creativity. Apart from showcasing their products, innovators will have the opportunity to provide a window to the industry for business matching during the exposition.

Tan Sri Dato' Sri Sallehuddin Mohamed  
Pro-Chancellor, Universiti Teknologi MARA

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## SPECTRO-GIS

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In this study, a field portable spectroradiometer, the GER 1500, covering the Ultraviolet, Visible and Near-Infrared wavelengths from 350 nm to 1050 nm was used to record the spectral response readings of different ground cover types. The measurement was done when the sun was at several instant positions in the sky to find out whether it has significant impact on the spectroradiometer reading of the targets. These instant positions of the sun were determined via spherical computation. The result from the measurements made against selected target features by the spectroradiometer is an output file containing signature plot data that was generated in .sig and ASCII format. This study attempts to convert the spectroradiometer data into a GIS-enabled format. The development of a spectro-GIS tool, which was customized using Visual Basic .Net programming language that enables the tools to run independently and automate the process of the conversion and generation of spectral library of the surface target, is highlighted. The result of this study will be of benefit to the earth observation community in such a way that it will provide alternative automation of the spatial data archiving as well as the data integration and fusion of the land spectral signatures. The objectives of this study is to develop tools for the automation of the field spectroradiometer data conversion process as well as generating spatial database system to record the spatial signatures with respect to its location. A new generation tool is developed called Spectro-GIS enabling the automation of spectroradiometer data integration into a GIS software exhibited the novelty of this research. The success of Spectro-GIS customization brings new means to the hyperspectral mapping. The Spectro-GIS tool is capable to convert spectral signature into GIS data format while preserving the possible accuracy and coordinate system of the original data. This tool is able to convert data observed by field spectroradiometer (.sig) into GIS format (.shp) that allows data to be manipulated within the GIS software. The spectral wavelength data is converted into database format (.dbf) for easy manipulation. The conversion process for utilization of spectral signatures data generated through spectroradiometer can be done automatically while maintaining the datum, projection and positioning properties of the observation. The database may be used and shared among earth's scientist across the world, provided the extensive database is made available online. Moreover, the developed tools are able to avoid repetitive measurements and data acquisition of the same land cover class spectral signatures at the same location, thus it is cost-saving. The tools development requires very simple platform and allow an independent running module, which does not require any existing GIS software to activate the functions. Thus, cost incurred can be very minimal comparatively. The database among all has potential worldwide contributors.