UNIVERSITY OF MACAU

FACULTY OF SCIENCE AND TECHNOLOGY

DEPARTMENT of

CIVIL AND ENVIRONMENTAL ENGINEERING

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" Scope of Interdisciplinary research in Bio-geotechnology: From Geotechnical to Biotechnology to Design "

by

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Date: **07/06/2016 (TUESDAY)**

Time: **10:30AM – 11:30AM**

Venue: **E11 – 1006**

Abstract

The session explores the Multidisciplinary approaches in sustainable geotechnical/agricultural engineering. We are currently working on "sustainable geotechnical engineering using biochar/natural fiber from harmful waste/vegetation. These have implications in bioengineered slopes, green roofs, agricultural fields as well as wetlands. In the above theme, researchers with expertise from geotechnology (IIT Guwahati), biotechnology (Hungary, Tunisia and Poland), probabilistic analysis [IIT Guwahati], Artificial intelligence (AAIRG, China) and communicational material for industry/society (IIT Guwahati) are integrated in a very systematic framework through CREATED Collab (Founded by Prof Charu Monga, Department of Design, IIT Guwahati and collaborator). A demonstration will be given in linkage above mentioned expertise in application of bio-engineered slopes. Linkage of soil suction/moisture with vegetation parameters such as leaf area index/root area index was identified based on testing on series of experiments in laboratory and field. In addition, suctions in vegetated soils in field were analysed using a probabilistic framework. Artificial intelligence has been used to develop models to predict water retention curves under effect of roots. A novel natural textile was developed from harmful weed "Water hyacinth" for bio-engineering applications. All these research findings/products can be transferred from laboratory to society/industry using communication tools using animation, illustration, film making, virtual reality, and new media practices.

Biography

Dr. Ankit Garg's is currently an Assistant Professor in Department of Civil Engineering at IIT Guwahati. He is also World Bank Consultant (from June 2016) for infrastructure projects in Assam, India. His research focusses on investigation fundamental unsaturated hydraulic properties of soil with vegetation. He has extensively used both laboratory and field instrumentation to investigate such properties. In addition, he has expertise in investigating plant physical root and leaf characteristics such as transpiration reduction function, root distribution, root area index and leaf area index. He has identified its relation with unsaturated soil properties before for two species Schefflera heptaphylla and Cynodon dactylon. The work is published in 20 journals including those in inter-disciplinary nature such as "Journal of plant nutrition and soil science", "Catena", "Hydrological Processes", "Ecological Engineering". Currently, he is also involved in identifying the growth performance of transgenic Cow pea (Vigna ungiculata) in different types of atmospheric conditions. The experience will be very useful for achieving the desired objectives. He is also co-founder of applied artificial intelligence

research group (AAIRG) (www.aairg.org), whose aim is to provide a platform for conducting research in application of AI in different areas including bio-geotechnology. Currently, the group collaborators are from over 12 different countries. He has earlier delivered invited lectures on bio-geotechnology related work at Ruhr University Germany and South China University of Technology China.

ALL ARE WELCOME!