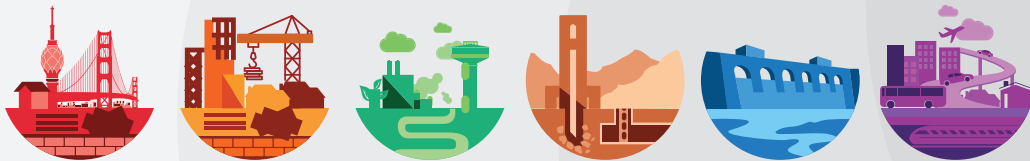




DEPARTMENT OF CIVIL ENGINEERING

Proceedings of  
**CIVIL ENGINEERING**  
Research Symposium 2022  
**CERS 2022**

**BOOK OF ABSTRACTS**



Department of Civil Engineering  
University of Moratuwa  
December 2022

# **CIVIL ENGINEERING RESEARCH SYMPOSIUM**

**2022**

1<sup>st</sup> December 2022

Department of Civil Engineering

University of Moratuwa

Sri Lanka

Proceedings of the Civil Engineering Research Symposium - 2022

1<sup>st</sup> December 2022, University of Moratuwa

Published by the Department of Civil Engineering

Faculty of Engineering

University of Moratuwa, Katubedda, 10400, Moratuwa, Sri Lanka

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**Dedicated to**



**Professor Anuruddha Puswewala**

Formally retired from University of Moratuwa  
on 30<sup>th</sup> September 2022

# Civil Engineering Research Symposium 2022

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## Message from the Head of the Department

It is with great pleasure that the Department presents the proceedings of the Civil Engineering Research Symposium (CERS) 2022. The proceedings consist of the research outputs of undergraduate students of the 2017 Intake and a selected group of postgraduate students.



Civil Engineers face many challenges due to the diverse spectrum of the field circumstances for which some degree of out of the box thinking is very much needed to match the prevailing state of the art technology. In order to produce young engineers who are ready to face such challenges, the Department of Civil Engineering carries out multi-faceted research at both undergraduate and postgraduate levels. The wealth of knowledge that the academic staff of the department possesses would trickle down to the students in the form of final year research of undergraduates and at the postgraduate level. This Symposium creates an ideal platform for them to showcase their research outputs to a wider audience.

Furthermore, the CERS 2022 could be identified as a unique Symposium since an eminent academic from the University of Cambridge, United Kingdom, Prof. Campbell Middleton delivers the keynote address. I am sure this would allow our students to get a flavour of state-of-the-art research going on in the developed world.

Another unique feature of CERS 2022 is that the Symposium is dedicated to one of our own distinguished professors who retired in 2022. Prof. U.G.A. Puswewala was our former Dean, Faculty of Engineering for a period of 6 years. The Alumni batch, Intake 2004 who came forward to sponsor the symposium with their generous support has made this Symposium a landmark in the department's endeavours.

I wish the CERS 2022 will be a fruitful Symposium for all the participants and it will benefit the Civil Engineering industry as a whole. I am confident that the research findings presented can be used to address unsolved research questions with greater confidence.

Prof. Chintha Jayasinghe  
Head/Department of Civil Engineering

## Symposium Agenda

09:00 – 09:15	Opening remarks by the Head of the Department
09:15 – 10:15	Keynote Lecture by Professor Campbell Middleton from the University of Cambridge, United Kingdom
10:15 – 10:45	Morning Tea Break
10:45 – 11:45	Research Presentations: Morning Session <sup>1</sup>
11:45 – 12:15	Panel Discussion for Morning Presentation Session
12:15 – 13:15	Lunch Break
13:15 – 14:15	Research Presentations: Afternoon Session <sup>2</sup>
14:15 – 14:45	Panel Discussion for Afternoon Presentation Session
14:45 – 15:00	3-MT Challenge Video Presentation and Award Ceremony
15:00 – 15:15	Vote of Thanks by Conference Secretary
15:15	Afternoon Tea

### <sup>1</sup> Research Presentations: Morning Session (10:45 – 11:45)

10:45 – 10:55	Cost Economics of Precast Walling Systems for Multi-Storey Buildings – A Case Study Based Approach by R. M. B. C. K. Rathnayake
10:55 – 11:05	Analysis of the Effect of Wind on Façade Fire Propagation through Computational Fluid Dynamics Modelling by G.K.U.S. Gunarathne
11:05 – 11:15	Mobilisation of Negative Skin Friction through Soft Soil Sandwiched between Stiff Residual Soil Layers by F.S.A. Ansar

- 11:15 – 11:25                      Assessment of Traditional Water Yield Forecasting Methods based on selected two Dry Zone Basins in Sri Lanka by W.D.P. Madusanka
- 11:25 – 11:35                      Design-Informed Structural Optimisation by I.T. Amarasinghe
- 11:35 – 11:45                      Study of the Influence of Construction Sequence on Slope Rectification Projects by H.P.J. Vimukthi

**<sup>2</sup> Research Presentations: Afternoon Session (13:15 – 14:15)**

- 13:15 – 13:25                      Homogenisation of Ultra-Thin Woven Fibre Composite Structures under High Curvatures by W.U.D. Weerasinghe
- 13:25 – 13:35                      Utilisation of Rice Husk Ash for Soil Stabilisation by R.J.K.P.N. Ranathunga
- 13:35 – 13:45                      Study on Climate Elasticity of Runoff in Kalu and Kelani River Basins in the Wet Zone of Sri Lanka by W.M.R.T.Y. Wijekoon
- 13:45 – 13:55                      Analysis of Optimal Expansion Level of a Single Runway Airport by K.D.S.V. Siriwardena
- 13:55 – 14:05                      Establishment of Threshold Rainfall Intensities for Critical Slopes in Sri Lanka by V. R. Panagoda
- 14:05 – 14:15                      Development of an overall Construction Productivity Assessment Framework and an Improvement Model by U.A.K. Premakumara



## **Keynote: Data is the New Gold**



### **Professor Campbell Middleton**

Laing O'Rourke

Professor of Construction Engineering

Director of Laing O'Rourke Centre for  
Construction Engineering & Technology

Fellow of King's College

University of Cambridge

United Kingdom

### **About the Keynote Speaker**

Prof. Middleton is the Professor of Construction Engineering and the Director of Laing O'Rourke Centre for Construction Engineering and Technology at Cambridge University. Prof. Middleton is the Chairman of UK Bridge Owners Forum that was established in year 2000 by representatives of the major bridge owning organizations in the UK to identify research needs and priorities for the bridge infrastructure. He has been awarded the Henry Adams Award of the Institution of Structural Engineers (1999) and the Telford Premium Award (1999) and Telford Gold Medal (2010) from the Institution of Civil Engineers, UK. He is a fellow of the Institution of Civil Engineers (ICE) and Institution of Engineers, Australia and has been involved in development of Codes of Practices for bridges and has been acting as a specialist bridge consultant to various clients in the UK and abroad.

### **Note from the Keynote Speaker**

It is a great pleasure to be a part of the Civil Engineering Research Symposium (CERS) 2022 held at the Department of Civil Engineering, University of Moratuwa. I am delighted to see both undergraduates and postgraduates have been given an opportunity to present their research findings at a department-organised conference so that it could be a steppingstone for them to publish at international conferences and journals. I have been associated with the Department of Civil Engineering activities since my first visit to the department in 2015. Since then, I have seen tremendous growth and improvement in the department. I am very happy to be a part of this important institution, with highly recognised academic activities, as the external examiner of the Department of Civil Engineering. I wish CERS 2022 every success, and I am looking forward to having engaging discussions with the presenters and participants.

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