

Online Technical Talk

Shape-Finding in Tensioned Membrane Structures

Synopsis

Procedures for stress analysis of tensioned membrane structures have been used as the basis for developing the computational strategies for form-finding. The proposed Nonlinear Analysis Method computational strategies consisted of two phases.

Phase I is an analysis which starts with an initial assumed shape with anticlastic feature to obtain an updated shape for initial equilibrium shape. This is then followed by Phase II which is aimed at checking the convergence of updated shape obtained at the end of Phase I. During Phase I, material properties with very small values of not more than 10% of the actual values are used. Both warp and fill stresses are kept constant to be the same as the prescribed prestress.

In Phase II, the actual material properties values are used, and the resulting warp and fill stresses are checked against the prescribed prestress through iterative calculation. The problem of the elements ending up in compression is overcome by keeping the stresses to be constantly equal to prestress during Phase I. The difficulties to control the final shape and stress in form-finding have been overcome by using material properties with very small values and keeping warp and fill stress constant during Phase I. The proposed computational strategies for form-finding using nonlinear analysis have been proven to be applicable for form-finding.



The Institution of Engineers, Malaysia
(Penang Branch)



6 May 2025 (Tues)



6.30pm – 8.30pm



BEM CPD Hours: 2

Ref: IEM25/PG/137/T (w)



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About the Speaker

Hooi Min YEE graduated with a doctorate degree Structural Engineering, Master of Science Engineering and Bachelor of Engineering (Honours) Civil Engineering from the Universiti Sains Malaysia, Pulau Pinang, Malaysia. Hooi Min YEE was a fellow at Universiti Sains Malaysia. After graduating, she worked as senior lecturer at Faculty of Civil Engineering, Universiti Teknologi MARA, Pulau Pinang, Malaysia in 2011 and was promoted to Associate Professor in 2017. Her research interests are Computational Mechanics, Computational Analysis of Shell and Spatial Structures, Nonlinear Analysis and Engineering Education. She is a supervisor of PhD and Master students. She is an external and internal examiner for postgraduate students.



Speaker
**Associate Professor
Ir. Dr. Yee Hooi Min**

Associate Professor Ir. Dr. Yee is also certified as an 'International Professional Engineer', 'APEC Engineer', 'ASEAN Engineer', Professional Engineer with Practising Certificate of Board of Engineers Malaysia, Fellow of The Institution of Engineers Malaysia, Associate Fellow of ASEAN Academy of Engineering and Technology, Member of Construction Industry Development Board Malaysia (2006-2021) and Corporate Member of Concrete Society of Malaysia. She is the head and evaluation panel of Engineering Accreditation Council and member of evaluation panel of Engineering Technology Accreditation Council. She is a Professional Engineer Interviewer/Examiner for The Institution of Engineers Malaysia since 2016. She is also a Board of Engineers Malaysia Outcome-based Professional Examination Examiner (BEM PAE Examiner) since 2024. She as an Executive Committee/Ordinary Committee member of The Institution of Engineers Malaysia (Penang Branch) from 2014-2016; 2017-2019; 2019-2020, 2020-2021 and 2021-2022.



Moderator:
Ms Goh Shing Yi

For her much-appreciated leadership and contributions towards excellence in engineering, society enhancement and nation development; the international Engineering Fraternity conferred Ir. Dr. Yee the ASEAN Federation of Engineering Organisations (AFEO)'s Honorary Member Award by AFEO Governing Board which carries the abbreviation M.AFEO after her name in 2018. She is awarded Universiti Teknologi MARA 'Excellent Service Award' for 2014 and 2021. She as a vice-chairman for the 2 international conferences have been held in Malaysia in 2015. Associate Professor Ir. Dr. Yee has obtained 19 awards in Invention, Innovation and Research Design Platform and has published 125 up-to-date publications. Her other achievements include invitations as Keynote Speaker, International Invited Speaker, International Visiting Professor, Session Chairman, technical committee and publicity committee chair to over international and national technical conferences and seminars worldwide which include those in Czech Republic, United Kingdom, Denmark, Ireland, France, Austria, Spain, Turkey, Australia, Republic of China, Singapore, Indonesia, Thailand, Vietnam and Malaysia.