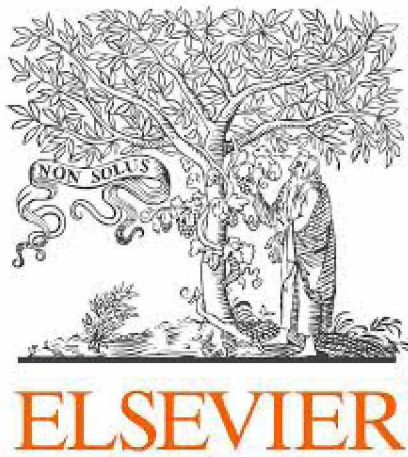


ENGINEERING STUDIES

The background is a solid teal color. It features several overlapping, semi-transparent globe icons. Each globe is rendered with a grid of small squares or dots, giving it a digital or pixelated appearance. The globes are scattered across the page, with some appearing larger and more prominent than others, creating a sense of depth and global connectivity.



Engineering Studies

Issue 3 (2), 2018

VOLUME 10

Taylor & Francis

2018

Engineering Studies, Issue 3 (2), Volume 10. Taylor & Francis, 2018. - Pages 300-832.

The edition materials are posted in Scopus and Web of Science.

Source Normalized Impact per Paper (SNIP): 0.514

SCImago Journal Rank (SJR): 0.217

Impact Factor: 0.234

*2016 Journal Citation Reports®, Thomson Reuters

Editor-in-Chief

Cyrus Mody - *Chair in the History of Science, Technology and Innovation, University of Maastrich, The Netherlands*

Deputy Editor:

Kacey Beddoes - *Department of Sociology, University of Massachusetts Lowell, USA*

Founding Editor:

Gary Downey - *Department of Science and Technology in Society, Virginia Tech, Blacksburg, Virginia, USA*

Associate Editors:

Atsushi Akeru - *Department of Science & Technology Studies, Rensselaer Polytechnic Institute, USA*

Konstantinos Chatzis - *University Paris-Est - LATTIS (UMR CNRS), France*

Maria Paula Diogo - *Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Portugal*

Aditya Johri - *Department of Applied Information Technology, George Mason University, USA*

Ulrik Jørgensen - *Department of Development and Planning, Aalborg University, Denmark*

Vivian Anette Lagesen - *Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology, Norway*

Donna Riley - *School of Engineering Education, Purdue University, USA*

Matthew Wisnioski - *Department of Science and Technology in Society, Virginia Tech, USA*

Chyuan-Yuan Wu - *Institute of Sociology and STS Program, National Tsing Hua University, Taiwan*

Web Editor

Brent Jesiek - *School of Engineering Education and School of Electrical and Computer Engineering, Purdue University, USA*

Assistant Editors

Andrew Chilvers - *Department of Civil, Environmental and Geomatic Engineering, University College London, UK*

Dana Denick - *National Science Foundation, Division of Civil, Mechanical, and Manufacturing Innovation, USA*

Ida Ngambeki - *Department of Computer and Information Technology, Purdue Polytechnic Institute, USA*

Justin Hess - *STEM Education Research Institute (SERI), Indiana University-Purdue University Indianapolis, USA*

Editorial Advisory Board

Stephen R. Barley - *Department of Management Science and Engineering, Stanford University, USA*

Sharon Beder - *Science, Technology & Society Program, University of Wollongong, Australia*

Bruno Belhoste - *Centre d'histoire des sciences et d'histoire des techniques, Université Paris 1 Panthéon-Sorbonne, France*

Li Bocong - *Department of Social Sciences, Chinese Academy of Sciences, China*

Taft Broome - *Department of Civil Engineering, Howard University, USA*

Louis Bucciarelli - *Program in Science, Technology and Society, Massachusetts Institute of Technology, USA*
Ivan da Costa Marques - *Graduate Program in Informatics, Universidade Federal do Rio de Janeiro, Brazil*
Michael Davis - *Department of Humanities, Illinois Institute of Technology, USA*
Christelle Didier - *Département d'éthique, Université Catholique de Lille, France*
Wendy Faulkner - *Science Studies Unit, University of Edinburgh, UK*
David E. Goldberg - *Department of Industrial and Enterprise Systems Engineering, University of Illinois at Urbana-Champaign, USA*
Irina Gouzevitch - *Centre Alexandre Koyé, Museum National d'Histoire Naturelle, France*
André Grelon - *L'École des Hautes Etudes en Sciences Sociales, France*
Deborah Johnson - *Department of Science, Technology, and Society, University of Virginia, USA*
Ronald Kline - *Departments of Electrical Engineering and Science & Technology Studies, Cornell University, USA*
Eda Kranakis - *Department of History, University of Ottawa, Canada*
Gideon Kunda - *Department of Labor Studies, Tel Aviv University, Israel*
Jang Gyu Lee - *School of Electrical Engineering and Computer Science, Seoul National University, Korea*
Juan Lucena - *Liberal Arts and International Studies, Colorado School of Mines, USA*
Peter Meiksins - *Department of Sociology, Cleveland State University, USA*
Carl Mitcham - *Liberal Arts and International Studies, Colorado School of Mines, USA*
Antoine Picon - *Department of Architecture, Harvard University, USA*
Bruce Seely - *Department of Social Sciences, Michigan Technological University, USA*
Sheri Sheppard - *Department of Mechanical Engineering, Stanford University, USA*
Amy Slaton - *Department of History and Politics, Drexel University, USA*
Knut H. Sørensen - *Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology, Norway*
Dominique Vinck - *LADHUL, Institute of Social Sciences, University of Lausanne, Switzerland*
Rosalind Williams - *Program in Science, Technology and Society, Massachusetts Institute of Technology, USA*

Print ISSN: 1937-8629
Online ISSN: 1940-8374

© Taylor & Francis, 2018

CONTENTS

Influence of NiCl₂/CdCl₂ as Mixed Filler on Structural, Thermal and Electrical Properties of PVA/PVP Blend <i>I.S. Elashmawi, E.M. Abdelrazek, A.Y. Yassin</i>	307
A Genetic Algorithm for Optimizing Background Subtraction Parameters in Computer Vision <i>Ramesh Rajagopalan</i>	327
Novel Data Mining Techniques for Incomplete Clinical Data in Diabetes Management <i>Herbert F. Jelinek, Andrew Yatsko, Andrew Stranieri, Sitalakshmi Venkatraman</i>	337
Anti-Inflammatory Effects of New Flavonoids from <i>Streptomyces</i> sp. BT01 in Lipopolysaccharide-Stimulated RAW 264.7 Murine Macrophages via Inhibition of NF-KappaB Activation <i>Thongchai Taechowisan, Srisakul Chanaphat, Wanwika Ruensamran, Waya S. Phutdhawong</i> ..	359
Nonlinear Programming in Precast Production and Transportation Planning <i>Aleksander Nicał</i>	385
Description of Vibration and Testing of the Water Turbine <i>Bogdan Żółtowski, Mariusz Żółtowski</i>	395
Real-time Power Calculation Using Lissajous Curve Method for DBD Reactors <i>Jacek Kołek, Tomasz Jakubowski</i>	406
Farm Tractor Reliability Quantification with the DPO Indicator <i>Karol Durczak, Mirosław Czechłowski, Adam Ekielski, Piotr Jurek</i>	417
Dual-diode Model of Functioning of Photovoltaic Modules in MATLAB Package <i>Mariusz Sarniak</i>	437
The Problem of Considering of the Torsional Stiffness of Reinforced Concrete Elements While Designing Statically Indeterminate Systems <i>Taliat Azizov, Nadzieja Jurkowska</i>	453
Optimization and Computational Intelligence Methods in Control Engineering Education of Marine Officers <i>Józef Lisowski</i>	467
About Systematic Errors in Measurements Microprofile Automobile Roads <i>A.M. Menshikov</i>	481
Use of Elderberry Juice for the Preparation of Soft Drinks <i>V. Koshova, A. Kobernitska</i>	499
The Analysis of the Accidents Causes at the Different Stages of the Construction Object's Life Cycle <i>Anastaia Lapina, Kseniya Shentsova, Andrey Ponomarenko</i>	508

The Problem of Considering of the Torsional Stiffness of Reinforced Concrete Elements While Designing Statically Indeterminate Systems

Taliat Azizov,

Professor, DSc (eng.), Pavlo Tychyna Uman State Pedagogical University, Ukraine,

Nadzieja Jurkowska,

Assistant Professor, Ph.D. (eng.), Institute of Structural Mechanics, Tadeusz

Kosciuszko Cracow University of Technology, Poland

E-mail: njurkowska@pk.edu.pl

Abstract: The influence of torsional stiffness of beam elements on a spatial work of bridges, overlaps, building frames and other complex statically indeterminate systems is presented in this article. It is shown, that existing design techniques for the torsional stiffness determination assume the obligatory presence of spatial spiral cracks, and the torsional stiffness of the elements with normal cracks is not researched. The technique for calculation of torsional stiffness of reinforced concrete elements with the normal cracks has been presented. It is demonstrated, that such an approach allows the design of reinforced concrete elements in torsion accounting for nonlinear properties of concrete.

Keywords: torsional stiffness, spatial behaviour, reinforced concrete cross ribbed structures, nonlinear stress-strain law for concrete in shear.

Introduction

The strain redistribution in the elements of any statically indeterminate system depends on the stiffness parameters of these elements and their ratio. The torsional stiffness of the cross ribbed elements affects significantly on their spatial behaviour. The vertical and horizontal elements of multi-storey framed buildings also have both longitudinal and bending deformations, as well as torsional deformations.

Various cracks also influence on the bending and torsional stiffness in the concrete cross ribbed systems (e.g. bridges, monolithic and prefabricated overlaps, etc.) [4, 8]. Separate elements may crack due to the local loads, as traffic load on one or more bridge beams, when the others elements are still uncracked. Meanwhile,