

The International Journal of ENGINEERING EDUCATION

FOUNDER AND FIRST EDITOR-IN-CHIEF

MICHAEL S. WALD

(1932–2008)

EDITOR

Ahmad Ibrahim, PhD, PEng
Toronto, Ontario, Canada
E-mail: ijee.editor@gmail.com

ASSOCIATE EDITORS

Thomas R. Kurfess, Ph.D., P.E. Professor and HUSCO/Ramirez Distinguished Chair in Fluid Power and Motion Control, George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, 801 Ferst Drive, Atlanta, GA 30332-0405, USA. E-mail: kurfess@gatech.edu

Milos Manic, Ph.D., Professor and MHG Director, Virginia Commonwealth University, Richmond, VA, 23284, USA.
E-mail: miskomis@gmail.com

D. McCarthy, Tempus Publications, Rathfarnham, Dublin 14, Ireland. E-mail: donalmcCarthy@eircom.net

J. Turner, Dublin Institute of Technology, Bolton Street, Dublin 1, Ireland. E-mail: jturner@dit.ie

EDITORIAL ADVISORY BOARD

Alice Agogino, Mechanical Engineering, University of California, Berkeley, 94720-1740, USA.

Stuart Burgess, Department of Mechanical Engineering, University of Bristol, UK.

Clive Dym, Harvey-Mudd College, Claremont CA 91711, USA.

Nesimi Ertugrul, Department of Electrical and Electronic Engineering, University of Adelaide, Adelaide 5005, Australia.

R. Felder, North Carolina State University, Raleigh NC 27695, USA.

Lawrence Genalo, Department of Materials Science and Engineering, Iowa State University, Ames IA 50011, USA.

Denis Gillet, EPFL, Swiss Federal Institute of Technology, CH-1015, Switzerland.

Wilmar Hernandez, Department of Circuits and Systems, EUIT de Telecomunicacion, Universidad Politecnica de Madrid, Ctra. Valencia km 7, 28031 Madrid, Spain.

Ahmed Hussein, Physics Department, University of Northern British Columbia, Prince George, B.C., Canada.

Dogan Ibrahim, Department of Biomedical Engineering, Near East University, Nicosia, Cyprus.

Sandra Ingram, Design Engineering, University of Manitoba, Winnipeg, Manitoba, Canada.

J. Jawitz, Centre for Higher Education Development, University of Cape Town, South Africa.

Kok Kiong Tan, Department of Electrical and Computer Engineering, National University of Singapore, Singapore.

Paul King, Department of Biomedical Engineering, Vanderbilt University, Nashville TN 37253, USA.

Anette Kolmos, UCPBL, Aalborg University, Fibigerstraede 13, DK-9220 Aalborg, Denmark.

C. Y. Lam, School of Mechanical and Aerospace Engineering, Nanyang Technological, Singapore 639798.

Vinod K. Lohani, Department of Engineering Education, Virginia Tech, USA.

Susan Lord, Department of Engineering, University of San Diego, CA 92110, USA.

J. F. Marchman, Virginia Polytechnic Institute and State University, Blacksburg VA 24061, USA.

Tom Owens, Department of Electrical Engineering & Electronics, Brunel University, Uxbridge, UK.

Shirley Pomeranz, Department of Mathematical and Computer Sciences, The University of Tulsa, Tulsa, OK 74104-3189, USA.

Z. J. Pudlowski, Monash University, Clayton, Melbourne, Vic 3168, Australia.

Nicholas Salamon, Engineering Science & Mechanics, Penn State University, University Park, PA 16802, USA.

D. Schaefer, Georgia Institute of Technology, Savannah, GA 31407, USA.

Thomas C. Sheahan, College of Engineering, Northeastern University, Boston, MA 02115, USA.

Sheri D. Sheppard, Department of Mechanical Engineering, Stanford University, Stanford, CA 94305, USA.

P. Shiue, Christian Brothers University, Memphis TN 38104, USA.

C. S. Slater, Rowan University, Department of Chemical Engineering, Glassboro, NJ, USA.

I. Verner, Department of Education in Technology & Science, Israel Institute of Technology, Haifa 32000, Israel.

B. Wagner, Center for Didactics of Technology, University of Hannover, Germany.

Levent Yilmaz, Computer Science and Software Engineering, Auburn University, Auburn AL 36849, USA

Subscription Rates

For complete information, please contact:

International Journal of Engineering Education — ijee@eircom.net or ijee.office@gmail.com

Copyright © 2014 TEMPUS Publications Published 6 per annum

It is a condition of publication that manuscripts submitted to this journal have not previously been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher, if and when the article is accepted for publication. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and transactions. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

Photocopying Information for Users in the U.S.A.

The Item-free Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided by the stated fee for copying beyond that permitted by Section 107 or 108 of the United States Copyright Law, is paid. The appropriate remittance of \$3.00 per copy per article is paid directly to the *Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970*.

Permission for Other Use

The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher for such copying.

The Item-fee Code for this publication is: **0949-149X/92 \$3.00 + 0.00**