



# Transactions of FAMENA



UNIVERSITY OF ZAGREB

FACULTY OF MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE

✉ HR – 10 002 ZAGREB, Ivana Lučića 5

☎ 01 61 68 540 / Fax 61 68 506

e-mail: famena@fsb.hr

https://famena.fsb.hr

**Editor-in-Chief**  
Bojan Jerbić

**Founding Editor**  
Ivo Alfirević

## Associate Editors

Hrvoje Kozmar

Zdravko Terze

Zdenko Tonković

Toma Udiljak

## Technical Editor

Dragan Žeželj

## Advisory Board

### Eberhard Abele

Darmstadt University of Technology, Germany

### Charalampos C. Baniotopoulos

University of Birmingham, United Kingdom

### Hester Bijl

Delft University of Technology, Netherlands

### Otakar Bokůvka

University of Žilina, Slovakia

### Franc Čuš

University of Maribor, Slovenia

### Xilun Ding

Beijing University of Aeronautics and Astronautics, China

### Igor Emri

University of Ljubljana, Slovenia

### Yordan Garbatov

Technical University of Lisbon, Portugal

### Gerhard A. Holzapfel

Graz University of Technology, Austria

### David Hui

University of New Orleans, LA, USA

### Alojz Ivanković

University College Dublin, Ireland

### Branko Katalinić

Vienna University of Technology, Austria

### Danica Kragic

Royal Institute of Technology, Stockholm, Sweden

### Dirk Lefebber

Vrije Universiteit Brussel, Belgium

### Šime Malenica

Bureau Veritas, Paris, France

### Herbert A. Mang

Vienna University of Technology, Austria

### Dan Negrut

University of Wisconsin – Madison, WI, USA

### Vlastimir Nikolić

University of Niš, Serbia

### Giorgio Olmi

University of Bologna, Italy

### Stanislav Pospíšil

Czech Academy of Sciences, Czech Republic

### Carlo Sansour

The University of Nottingham, United Kingdom

### Park Hong Seok

University of Ulsan, Korea

### Ahmed Shabana

University of Illinois at Chicago, IL, USA

### Jurica Sorić

University of Zagreb, Croatia

### Boris Štok

University of Ljubljana, Slovenia

### Zdravko Virag

University of Zagreb, Croatia

## Local Editorial Board

Nenad Bojčetić

Ivanka Boras

Željko Božić

Danko Brezak

Lidija Čurković

Nastia Degiuli

Goran Đukić

Ivica Galić

Darko Ivančević

Andrej Jokić

Igor Karšaj

Zdenka Keran

Dražan Kozak

Darko Kozarac

Zoran Kožuh

Lovre Krstulović-Opara

Zoran Lulić

Dubravko Majetić

Saša Mudrinić

Joško Parunov

Jasna Prpić-Oršić

Ivica Skozrit

Tomislav Staroveški

Stanko Škec

Željko Tuković

Milan Vrdoljak

Dario Zlatar

Irena Žmak

**Language Advisers:** Božena Tokić  
Snježana Kereković

**Secretary:** Tina Pintar

Printed by: Stega tisak d.o.o., Zagreb