

MINING – INFORMATICS, AUTOMATION AND ELECTRICAL ENGINEERING
Published since 1962

DOI: <https://doi.org/10.7494/miag>

Chairman of the Scientific Board/ Przewodniczący Rady Naukowej:
Grzegorz Cieplok, AGH University of Krakow, Krakow (Poland)

Secretary of the Scientific Board/ Sekretarz Rady Naukowej:
Tomasz Rokita, AGH University of Krakow, Krakow (Poland)

Members of the Scientific Board/ Członkowie Rady Naukowej:
Dariusz Andriukaitis, Kaunas University of Technology, Kaunas (Lithuania)
Imashev Askar, Karaganda Technical University, Karaganda (Kazakhstan)
Naj Aziz, University of Wollongong, Wollongong (Australia)
Edward Chlebus, Wrocław University of Science and Technology, Wrocław (Poland)
George L. Danko, University of Nevada, Reno (USA)
Jiří Fries, Technical University of Ostrava, Ostrava (Czech Republic)
Waldemar Korzeniowski, AGH University of Krakow, Krakow (Poland)
Dou Lin-ming, China University of Mining and Technology, Xuzhou (China)
Arkadiusz Meżyk, Silesian University of Technology, Gliwice (Poland)
Josph Molnar, University of Miskolc, Miskolc (Hungary)
Jacek Paraszczak, Laval University, Quebec (Canada)
Liubomyr Romanyshyn, Ivano-Frankivsk National Technical University of Oil and Gas, Ivano-Frankivsk (Ukraine)
Sorin Mihai Radu, University of Petrosani, Petrosani (Romania)
Yuan Shujie, Anhui University of Science and Technology, Huainan (China)
Marek Sikora, Institute of Innovative Technologies EMAG, Katowice (Poland)
Radosław Zimroz, Wrocław University of Science and Technology, Wrocław (Poland)
Nenad Zrnčić, University of Belgrade, Belgrade (Serbia)

Editorial staff/ Redakcja czasopisma:

Editor in Chief/ Redaktor naczelny – *Krzysztof Krauze*, AGH University of Krakow, Krakow (Poland)
Deputy Editor in Chief/ Zastępca redaktora naczelnego – *Krzysztof Filipowicz*, Silesian University of Technology, Gliwice (Poland)
Managing Editor/ Kierownik redakcji – *Kamil Mucha*, AGH University of Krakow, Krakow (Poland)
Manuscript Editor/ Redaktor techniczny – *Tomasz Wydro*, AGH University of Krakow, Krakow (Poland)
Web Editor/ Redaktor strony internetowej – *Marcin Nawrocki*, AGH University of Krakow, Krakow (Poland)

Associate editors/ Redaktorzy tematyczni:

Automation and robotics – *Jarosław Joostberens*, Silesian University of Technology, Gliwice (Poland)
Electrical engineering – *Tomasz Siostrzonek*, AGH University of Krakow, Krakow (Poland)
Environmental engineering, mining and energy technology – *Horst Gondek*, VSB Technical University of Ostrava, Ostrava (Czechia)
Materials engineering – *Vitalii Panchuk*, Ivano-Frankivsk National Technical University of Oil and Gas, Ivano-Frankivsk (Ukraine)
Mechanical engineering – *Leonel Francisco Castañeda Herediaeradia*, EAFIT University, Medellin (Columbia)
Technical IT – *Ryszard Klempka*, AGH University of Krakow, Krakow (Poland)
Telecommunications – *Antoni Wojaczek*, Silesian University of Technology, Gliwice (Poland)
Quality management – *Erika Sujová*, Technical University in Zvolen, Zvolen (Slovakia)

PUBLISHER

Linguistic Corrector/ Korekta językowa: *Aedden Shaw* (English/ język angielski), *Kamila Zimnicka* (Polish/ język polski)

Desktop Publishing/ Skład komputerowy: Andre

Cover Design/ Projekt okładki i strony tytułowej: ROMEDIA-ART

© Wydawnictwa AGH, Kraków 2023, Creative Commons CC-BY 4.0 License

ISSN 2449-6421 (online)
ISSN 2450-7326 (printed)

The electronic version of the journal is the primary one.
Number of copies: 50

Wydawnictwa AGH (AGH University Press)
al. A. Mickiewicza 30, 30-059 Kraków
tel. 12 617 32 28, 12 636 40 38
e-mail: redakcja@wydawnictwoagh.pl
www.wydawnictwo.agh.edu.pl
