

Vol. 23, No. 1/2, 2014

Machine
GRAPHICS & VISION

International Journal

Published by
The Faculty of Applied Informatics and Mathematics
Warsaw University of Life Sciences – SGGW
Nowoursynowska 159, 02-776 Warsaw, Poland
in cooperation with
The Association for Image Processing, Poland – TPO

M a c h i n e G R A P H I C S & V I S I O N

Editor-in-Chief: Leszek J. Chmielewski, The Faculty of Applied Informatics

and Mathematics – WZIM, Warsaw University of Life Sciences – SGGW

Past Editor and Founder: Wojciech S. Mokrzycki

Honorary Editor: Juliusz L. Kulikowski

Executive Editors:

Ryszard Kozera, Warsaw University of Life Sciences – SGGW, Poland

Arkadiusz Orłowski, Warsaw University of Life Sciences – SGGW, Poland

Artur Przelaskowski, Warsaw University of Technology, Poland

Artur Wiliński, Warsaw University of Life Sciences – SGGW, Poland

Advisory Board:

Bengtsson E., Uppsala University (SE)

Bhattacharya P., Concordia University, Montreal (CA)

Chetverikov D., Computer and Automation Research Institute HAS, Budapest (HU)

Choraś R., University of Technology & Agriculture, Bydgoszcz (PL)

Czachórski T., Institute of Theoretical and Applied Informatics, PAS, Gliwice (PL)

Flasiński M., Jagiellonian University, Cracow (PL)

Gagalowicz A., INRIA, Le Chesnay (FR)

Gillies D., Imperial College, London (GB)

Grabska E., Jagiellonian University, Cracow (PL)

Hillion A., IT - TELECOM Bretagne, Brest (FR)

Hlaváč V., Czech Technical University, Prague, (CZ)

Kiciak P., Warsaw University (PL)

Klette R., The Auckland University (NZ)

Kolingerova I., University of West Bohemia, Plzeň (CZ)

Krasnoproshin V., Byelorussian State University, Minsk, (BY)

Kurzyński M., Wrocław Technical University (PL)

Leonardis A., University of Ljubljana (SI)

Malina W., Gdańsk University of Technology (PL)

Materka A., Technical University of Łódź (PL)

Myszkowski K., Max-Planck-Institute for Computer Science (DE)

Nagahashi H., Tokyo Institute of Technology (JP)

Nieniewski M., University of Łódź (PL)

Palenichka R., University of Quebec in Outaouais, Gatineau (CA)

Palus H., Silesian University of Technology, Gliwice (PL)

Pamuła J., Academy of Fine Arts, Cracow (PL)

Pieczynski W., Institut National des Télécommunications, Evry (FR)

Postaire J.-G., Université des Sciences et Technologies, Villeneuve d'Ascq (FR)

Punys V., Kaunas University of Technology, Kaunas (LT)

Sharma A., Panjab University, Chandigarh (INDIA)

Skala V., University of West Bohemia, Plzeň (CZ)

Stępor K., Silesian University of Technology, Gliwice (PL)

Stępień C., Warsaw University of Technology (PL)

Szyszkowicz M., Otawa (CA)

Śluzek A., Abu Dhabi, Khalifa University (AE)

Tadeusiewicz R., AGH University of Science and Technology, Cracow (PL)

Titov V.S., Technical University of Kursk (RU)

Tombre K., INRIA Lorraine, Villers-les-Nancy (FR)

Truphanov M., Kursk State Technical University (RU)

Valev V., University of North Florida, Jacksonville (US)

Velichova D., Slovak Technical University, Bratislava (SK)

Wojciechowski K., Silesian University of Technology, Gliwice (PL)

Zamojski W., Wrocław Technical University (PL)

Editorial Office Secretary: Luiza Ochnio, Warsaw University of Life Sciences – SGGW

TeXsetting by Urszula Krus

Language verification by Beata Konikowska

Vol. 23, No. 1/2, 2014

Machine
GRAPHICS & VISION

International Journal

Published by
The Faculty of Applied Informatics and Mathematics
Warsaw University of Life Sciences – SGGW
Nowoursynowska 159, 02-776 Warsaw, Poland
in cooperation with
The Association for Image Processing, Poland – TPO

The goal of **Machine GRAPHICS & VISION** is to provide a medium for exchanging information on image processing and image communication between the computer and its environment.

The journal concentrates on computational methods of synthesis and analysis of the models underlying computer generated, analyzed or processed imagery. In particular, the emphasis is on the methods of:

- image synthesis,
- computational geometry,
- three-dimensional imaging,
- computer graphics art,
- diagrammatic representation and reasoning,
- graphical data presentation and knowledge-oriented visualization,
- animation,
- image models and transforms,
- mathematical approaches to image analysis and processing
 - analytical geometry
 - statistical methods
 - functional analysis and spectral methods
 - logical methods
 - formal linguistic methods
 - fractals
- visual pattern matching and recognition
- three-dimensional scene mapping and modeling
 - statistical methods
 - spectral methods
 - structural methods
- motion capture
- composite image understanding
- monocular and stereo vision
- modeling of human visual perception

The journal encourages papers on research and applications to processing of scientific, medical and technological images, engineering design, graphical arts, environment protection, etc. State-of-the-art, expository as well as tutorial papers in the above-mentioned areas are welcome.

Copyright 2014 Faculty of Applied informatics and Mathematics (WZIM), SGGW

It is the condition of publication that manuscript submitted to this journal has not been published and will not be simultaneously submitted or published elsewhere. By submitting the 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 paper, including reprints, photographic reproductions, microforms, diskettes, Internet, or any other reproductions of similar nature, and translations. No part of this publication may be reproduced, stored in a data-base system or transmitted in any form or by any means, whether electronic, electrostatic, mechanical, on magnetic tape, by photocopying, recording or otherwise, without prior permission in writing from the copyright holder.

The copyright owner's consent does not extend to copying for the purposes of: general distribution, promotion, creation of new works, or resale. Specific written permission must be obtained from the publisher for copying. Please contact the **Editorial Office: Faculty of Applied Informatics and Mathematics (WZIM) of the Warsaw University of Life Sciences – SGGW, Nowoursynowska 159, 02-776 Warsaw, Poland, e-mail: MGV@sggw.pl, <http://mgv.wzim.sggw.pl>**

Published Quarterly

Subscription. **MG&V** (ISSN 1230-0535) can be ordered directly through Foreign Trade Enterprise ARS POLONA Joint Stock Company, Obrońców 25, 03-933 Warszawa, Poland
Fax: +48 22/509 86 48, Tel. +48 22/509 86 63, e-mail: arspolona@arspolona.com.pl