PROCEEDINGS OF SPIE

Independent Component Analyses, Wavelets, Neural Networks, Biosystems, and Nanoengineering VIII

Harold H. Szu
F. Jack Agee
Editors

7–9 April 2010
Orlando, Florida, United States

Sponsored and Published by
SPIE

Volume 7703

Proceedings of SPIE, 0277-786X, v. 7703

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

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Please use the following format to cite material from this book:
Author(s), "Title of Paper," in *Independent Component Analyses, Wavelets, Neural Networks, Biosystems, and Nanoengineering VIII*, edited by Harold H. Szu, F. Jack Agee, Proceedings of SPIE Vol. 7703 (SPIE, Bellingham, WA, 2010) Article CID Number.

ISSN 0277-786X
ISBN 9780819481672

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445
SPIE.org

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Printed in the United States of America.

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Introduction

The year 2010 marks the eighth anniversary of the SPIE conference on Independent Component Analysis, Wavelets, Neural Networks, Biosystems and Nanoengineering. The SPIE Defense Security and Sensing (DSS) Symposium has provided our community with the proper venue for not only information exchange, but also education through shortcourses and networking through various hospitality events. The symposium itself, boasts over 500 exhibiting vendors and talks given by over 6000 scientists and engineers worldwide. Our conference is, among 30, relatively small, but has a reputation of producing some of the most cited works in the disciplines covered. Onsite publication and dissemination of the Conference Proceedings has proven useful time and time again providing a timely dissemination of on-going research in smart sensors, processing and end-to-end systems to libraries worldwide.

Being co-chairs, we often face questions about our goals and focus for the future of the conference series. To state the question plainly, how has the conference endured, and how can it continue to endure and evolve in an uncertain future? The answer lies partly in the following secret: We have adapted a workable system tested by the Nobel Foundation for over half a century—passing the baton of honor…. "The past award recipients shall determine the new awardees." The role SPIE and the co-chairs serve is to act as facilitators for the decision process. A major difference between the systems is a lack of recourse in supporting the awardees. Thus we have improvised a temporary win-win-win solution: in order to prepare the interdisciplinary audience, state of the art knowledge is disseminated by both past and present award recipients, who are encouraged to teach short courses at the meetings.

The ICA conference, now in its 17th year with SPIE, was established to address our desire to learn from Mother Nature. The question of where to begin is a difficult one and thus we began slowly, building year by year, learning from one another. This year the results have been impressive. From the 2010 Wavelet Pioneer Award Recipient Prof. Jan-Olov Strömberg (Royal Institute of Technology), we learn how to "steal a smart algorithm" from the ear-eye like Wavelet transform. In the same theme, we follow brain-like neural nets seeking to learn, from observable effects, the underlying hidden causes explained by the 2010 recipient of the Unsupervised Learning Neural Network Independent Component Analyses (ICA): To Be Announced on-site. After a decade, some are ready for the "implementation" and "test and evaluation" of these advances. With this in mind, we encourage you to consider the NIH-phobia problem explained by our 2010 Biomedical Wellness Award recipient Prof. Yutaka Hata, (University of Hyogo). We introduce so-called "Nano-Engineering," as elucidated by our 2010 Nano-Engineering Pioneer Award recipient Prof. Diana Huffaker (University of California, Los Angeles). Nano-engineers can take advantage of the transitional nanometer

regime, which falls between classical physics and quantum mechanics and is technically defined as 10^{-9} m = 10 angstrom = 20 hydrogen atoms. Finally, we are ready to emulate the most robust, and perhaps most efficient field in its own right, System Biology, as elucidated by our 2010 Pioneer Award recipient Dr. Hamid Bolouri (Caltech) during the last day of our end-to-end program.

We wish to thank all of 2009 recipients, who headed the selection process for this year's recipients: Prof. Ronald Coifman, Prof. Mark Girolami, Prof. Tzyy-Ping Jung, Dr. Robert Shull, Takashi Yamakawa and Prof. Olad Wolkenhauer. The Conference would not be a success without you and your unselfish contributions.

We would also like to thank the SPIE technical support staff and last but certainly not least, I would like to thank the members of the program committee.

Harold Szu
F. Jack Agee