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Independent Component Analyses, Wavelets, Unsupervised Nano-Biomimetic Sensors, and Neural Networks V

Harold H. Szu
Jack Agee
Editors

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Introduction

SPIE proceeding Volume 6576, titled Independent Component Analyses Wavelets, Unsupervised Learning, Nano-Biomimetic Sensors, and Neural Networks V, has a special significance during a decade-long history of several new disciplines merging together naturally, that can help us design smart sensors web for a safer and better home care system for an aging population. It involves, other than the traditional **Wavelet Pioneer Award** presented during the last fifteen years and **Unsupervised Learning ICA Award** for the last 5 years, a new category of **Nanoengineering Award** for the biomimetic smart nano-sensors. These sensors may be built through the translation of nano-science and nanotechnology know-how developed throughout the last decade through the ten-billion dollar effort of National Nanotechnology Initiative. We must build the new discipline called "**nanoengineering**" in which the nano-robot controlled by the computer aided design (CAD) as the automated nano-manipulator, which can produce a reliable productivity beyond 25%. Moreover, we have introduced another new category called the **Wellness Engineering of the Year Award**. The reason behind the incorporation of two more award categories is that we must immediately develop an accumulatively effective and affordable set of smart pair devices to save the exuberant expenditure for the healthcare of the aging population, which will not be otherwise sustainable when all the post-war baby boomers retire (78 millions will cost 1/5~1/4 GDP in the U.S. alone). We need household affordable effective devices for the daily sampling of wellness baseline profile to compile unsupervised learning of personnel diagnostic aids: "A stitch in time saves nine."

The selection procedure adopted for decades for a qualified recipient is identical to the **Wavelet Pioneer Award** and the **Unsupervised Learning ICA Award**. Namely, the new winners of the Nanoengineering Award and the **Wellness Engineer of the Year Award** will automatically assume the position of next year's chair of the selection committee for the following year's recipients, and will also participate or replace the next retired committee member as the new member of the committee to select subsequent recipients. In other words, the management of the conference shall not involve in the selection process of awardees, but rather will facilitate the information for the new recipient. This procedure of separating the honor from the management has maintained the credibility of these awards over the years.

Also, per SPIE policy, the recipients will always write a review paper for publication, give a plenary talk for an hour, chair a panel discussion for an hour, and teach a short course during the conference. This useful education process will ensure that all attendances can fully benefit from his or her presence at the conference and record in the proceedings and tutorial notes. Also, this procedure can sustain and financially support his or her travel and lodging

expenditure. Such a quality assurance will be extended to the **Nano-Engineering Award** and **Wellness Engineer of the Year Award** in 2008.

We look forward to your advice and active participation. If you would like to contribute to a specific talk, chair a session, or recommend old or new speakers including yourself, please write the conference management.

Harold H. Szu