

FROM THE EXECUTIVE COMMITTEE

We are back from the short holiday break ready to begin 2012 with enthusiasm to carry a growing success for the fourth year of SIGNAL. Since its launch, a second page has been added that highlights recent publications of our members in prestigious journals. Furthermore, each month we receive numerous requests to add to the distribution list new readers interested in the field microsystems and their applications. The year ahead promises to be full of challenges. First of all we are actively involved in the organization of the 10th IEEE international NEWCAS conference to be held in Montreal, the city that saw its 1st edition in 2003. Also, ReSMiQ's management has undertaken to revive the relationship between the center and all graduate students under the supervision of the researchers members by setting up new initiatives to motivate student participation. Among these activities there is the student luncheon held in September and January each year where new students are invited to learn about our center, the ReSMiQ Innovation Day that will enable students to present technical demonstrations which will be rewarded with prizes for best presentation. In addition we will reward the best student paper selected among those published during the year. Another major objective is to continue to strengthen our links with the local industry working in our field. We will organize regular networking meeting in order to explore the possibilities for collaboration between the ReSMiQ and industrial partners in order to initiate research and development project in the field of microsystems. Finally, the ReSMiQ wish you a happy and most productive new year 2012.

Best regards,
M. Sawan, director

GET READY!

NEWCAS 2012

10th IEEE International NEWCAS Conference
June 17 - 20, 2012, Montréal, Canada
www.newcas2012.org

RESMIQ'S ACTIVITIES

ReSMiQ Networking meeting

Visit of the Cofamic laboratory, February 2nd at 5:00 pm, UQAM, Président Kennedy building, room PK1140.

[More details](#)

Message to members: we will be pleased to publish your news in forthcoming issues, let us know.

NEWS FROM OUR MEMBERS

EXPOSURE

Dr. Boland from ETS is participating in the mission to India organized by MDEIE to visit the cities of Mumbai, Bangalore and Delhi.

INVOLVEMENT

Dr. Fontaine from the University of Sherbrooke is the Scientific Program Chair for the 18th IEEE Realtime Conference 2012.

[More details](#)

Dr. Nicolescu and Dr. Bois from Polytechnique are respectively General Co-chair and Finance Chair of MPSoC'12.

[More details](#)

Dr. Sawan from Polytechnique is the technical program Chair of MWSCAS'12.

[More details](#)

ACHIEVEMENT

Dr. Nicolescu from Polytechnique is one of the editors of *Design Technology for Heterogeneous Embedded Systems*.

[More details](#)

Dr. Martel's research from Polytechnique has been selected as one of the 10 discoveries of the year by Québec-Science.

[More details](#)

SPOTLIGHT ON OTHER CONFERENCES

2012 International Symposium on Circuits and Systems (ISCAS 2012), May 20 - 22, 2012, Seoul, Korea.

[More details](#)

12th International Forum on Embedded MPSoC and Multi-core (MPSoC'12), July 9 - 13, 2012, Québec, Canada.

[More details](#)

55th IEEE International Midwest Symposium on Circuits and Systems (MWSCAS 2012), August 5 - 8, 2012, Boise, Idaho, USA.

[More details](#)

RESEARCH CONTRIBUTIONS

Some of the research achievements of our members.

This month, two major contributions and two titles are presented.

1. Semmaoui, H.; Drolet, J.; Lakhssassi, A.; **Sawan, M.** "Setting Adaptive Spike Detection Threshold for Smoothed TEO Based on Robust Statistics Theory" Transactions on Biomedical Engineering, vol. 59, no. 2, 2012.

Authors propose a novel approach aimed at adaptively setting the threshold of the smoothed Teager energy operator (STEO) detector to be used in extracellular recording of neural signals (Fig. 1). In this approach, to set the adaptive threshold of the STEO detector, they derive the relationship between the low-order statistics of its input signal and the ones of its output signal. This relationship is determined with only the background noise component assumed to be present at the input. Robust statistics theory techniques were used to achieve an unbiased estimation of these low-order statistics of the background noise component directly from the neural input signal. In this paper, the emphasis is made on extracellular neural recordings. However, the proposed

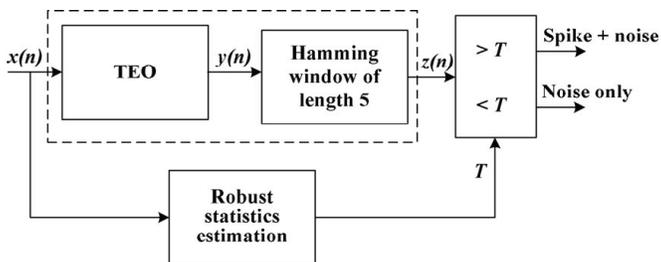


Fig. 1 Block diagram of the spike STEO detection with adaptive threshold.

method can be used in the analysis of different biomedical signals where spikes are important for diagnostic. Simulation results show that our approach is effective and robust, and outperforms state-of-the-art adaptive detection methods in its category.

2. Lefevre, F.; Chalifour, A.; Yu, L.; **Chodavarapu, V.**; Juneau P.; **Izquierdo R.** "Algal fluorescence sensor integrated into a microfluidic chip for water pollutant detection" Lab Chip, vol. 12, no. 787 2012.

Authors report the first miniaturized fluorescent sensor based on algae, with an organic light emitting diode (OLED) and an organic photodetector (OPD) integrated into a microfluidic chip. The blue emission OLED was used as the excitation source, while a blend of PTB3/

PC61BM was used for the fabrication of the organic photo-detectors which were then integrated in a microfluidic chip made from (poly)dimethylsiloxane (PDMS). The complete sensor (Fig. 2) is designed to detect algal fluorescence in the microfluidic chamber. Algal chlorophyll fluorescence enables evaluation of the toxicity of pollutants like herbicides and metals-ions from agricultural run-offs. The entirely organic bioassay here presented allowed detection of the toxic effects of the herbicide Diuron on *Chlamydomonas reinhardtii* green algae that gave 50% inhibition of the algae photochemistry (EC50) with a concentration as low as 11 nM.

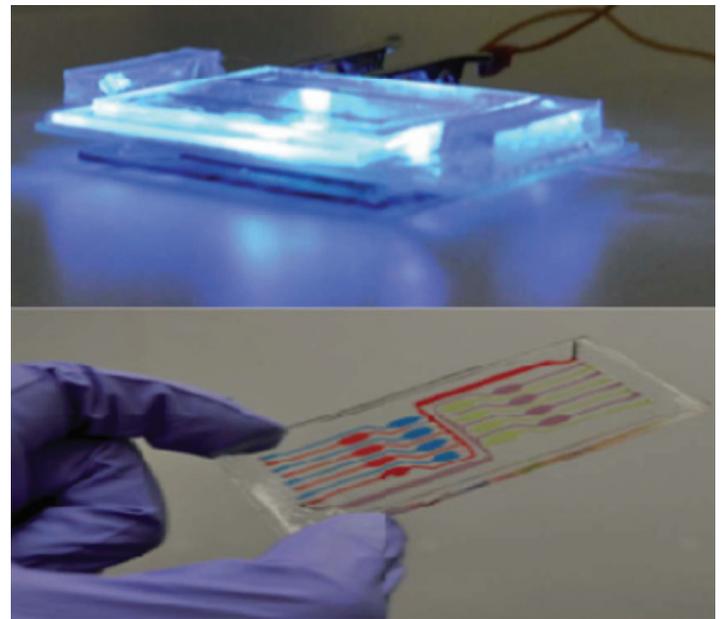


Fig. 2. Microfluidic chip with 16 chambers Fabricated sensor from two views.

Other Contributions of members December 2011 - January 2012

Salam, M.T.; **Sawan, M.**; Dang Khoa Nguyen "A Novel Low-Power-Implantable Epileptic Seizure-Onset Detector" IEE Transactions on Biomedical Circuits and systems, vol. 5, no. 6, 2011.

Njinowa, MS; **Bui, HT**; **Boyer, FR** "Novel Threshold-Based Standard-Cell Flash ADC" Circuits and Systems, vol. 3, p. 29-34, 2012.