

## FROM THE EXECUTIVE COMMITTEE

This issue of SIGNAL marks the beginning of the academic year 2012-2013. On this occasion, the Executive Committee of our center wishes you a pleasant return from vacation. In the previous edition we reported on the NEWCAS 10th edition, the excellent performance of the organizing committee and success. We posted several photos taken during the event on the conference website that we invite you to visit. Since 2009 it has been established that NEWCAS is alternately held in Québec and abroad. Until now it was held in Toulouse (2009) and Bordeaux (2011), and it is in Paris, city of light, that we will meet in 2013, from June 16 to 19. The call for papers is already available on the permanent website at [newcas.org](http://newcas.org). As we mentioned in a previous edition, ReSMiQ just celebrated 25 years of existence. For this occasion we invited all former directors of the center as well as representatives of FRQNT and our partners in industry to highlight our achievements during the past quarter century. Some of our members have received a distinction emphasizing their remarkable involvement in the promotion of our center. As for the most recent NSERC competition, the management of ReSMiQ congratulates all members who have received the NSERC discovery grant. This year six of our members have obtained their grant which will support their research work for the next five year. Finally, we return to our regular activities such as scholarship competition, intensive courses and seminars and our 5-to-7 networking meetings. Keep an eye on our website for more information.

Best regards,  
M. Sawan, director



ReSMiQ's directors since its beginning: E. Cerny (1985-1994), M. Aboulhamid (1995-1998), M. Sawan (1999-présent)

## RESMIQ'S ACTIVITIES

**Scholarship competition for graduate students.**  
APPLICATION DEADLINE – September 5, 2012.  
[Eligibility and Application](#)

**scholarship for post-doctoral fellow competition.**  
APPLICATION DEADLINE – September 17, 2012.  
[Eligibility and Application](#)

## NEWS FROM OUR MEMBERS

### EXPOSURE

Dr. Sawan of Polytechnique gave an invited talk on neuro-electronics as part of the Shanghai Jiao Tong University Summer School, and two others in Delhi and Bangalore, India entitled "Wireless Brain-Machine in Biosensing" as part of his involvement as DL in IEEE-SSCS.  
[More details for Jiao Tong U.](#) / [More details for IEEE-SSCS Delhi](#)

Dr. Sawan Polytechnique received the visit of a delegation of 15 researchers from the National Chiao Tung University in Taiwan.

### INVOLVEMENT

Dr. Sawan /of Polytechnique co-organized the conference IEEE EMB / CAS / SMC "Brain-Body-Machine Interfaces" in San Diego, California.  
[More details](#)

### ACHIEVEMENT

Dr. Peter of Polytechnique received a patent for "MEMS Tunable Silicon Fabry-Perot Cavity and Applications Thereof".

Dr. Domingue and Massicotte of UQTR received funding from Nano-Quebec for the project "Lamb waves acoustic microresonators for measuring pressure in a hostile environment".  
[More details](#)

### IEEE-NEWCAS2013 International conference

June 16 - 19, 2013, Paris, France  
[Call for papers](#)

### ReSMiQ Innovation Day

More than 4000\$ in awards for undergraduate and graduate students.  
[More details](#)

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

### SPOTLIGHT ON OTHER CONFERENCES

**IEEE International Conference on Computer Design (ICCD 2012)**, Sept. 30 - Oct. 3, 2012, Montréal, Canada.  
[More details](#)

**IEEE Biomedical Circuits and System Conference (BIO-CAS 2012)**, November 28 - 30, 2012, Hsinchu, Taiwan.  
[More details](#)

**2012 International on Electronics, Circuits and Systems (ICECS)**, December 9 - 12, 2012, Seville, Spain.  
[More details](#)

## RESEARCH CONTRIBUTIONS

Some of the research achievements of our members.  
This month, several major contributions are presented.

1. Wahby-Shalaby, M.A; **Omair Ahmad**, M., A multilevel structural technique for fingerprint representation and matching, Signal Processing, Online, 2012.

Incorporation of global features in minutia-based fingerprint recognition schemes enhances their recognition capability but at the expense of a substantially increased complexity. In this paper, authors introduce a novel low-complexity multilevel structural technique for fingerprint recognition by first decomposing a fingerprint image into regions based on only some of the global features and then formulating multilevel feature vectors to represent the fingerprint by employing both the global and local features.

2. Mounaim, F.; **Sawan, M.**, Toward A Fully Integrated Neurostimulator With Inductive Power Recovery Front-End, IEEE Transactions on Biomedical Circuits and Systems, vol.6, no. 4 , Aug. 2012.

As a first step towards total integration, authors present in this paper the design of a highly-integrated neurostimulator that can be assembled on a 21-mm diameter printed circuit board. The prototype is based on three custom integrated circuits fabricated in High-Voltage (HV) CMOS technology, and a low-power small-scale commercially available FPGA.

3. Hashemi, SS; **Sawan, M.**; **Savaria, Y.** "A High-Efficiency Low-Voltage CMOS Rectifier for Harvesting Energy in Implantable Devices, IEEE Transactions on Biomedical Circuits and System, vol. 6, no. 4, 2012.

In this paper the proposed rectifier circuit achieves a significant increase in its overall power efficiency and low voltage-drop. Therefore, the rectifier is good for applications with low-voltage power supplies and large load current. The highest voltages available in the circuit are used to drive the gates of selected transistors in order to reduce

leakage current and to lower their channel on-resistance, while having high transconductance.

### Autres contributions

Yadav, R.; Shah, A.K.; Loeb, J.A.; **Swamy, M.N.S.**; Agarwal, R. "Morphology-Based Automatic Seizure Detector for Intracerebral EEG Recordings" IEEE Transactions on Biomedical Engineering, vol. 59, no. 7, 2012.

Leduc-Primeau, F., Hemati, S.; Mannor, S.; **Gross, W.J.** "Dithered Belief Propagation Decoding" IEEE Transactions on Communications, vol. 60, no. 8, 2012.

### Contributions des membres à IEEE-EMBC 2012

Mirbozorgi, M.; Gosselin, B.; **Sawan, M.**, A., "Transcutaneous Power Transfer Interface Based on a Multicoil Inductive Link"

Ghafar-Zadeh, E.; Gholamzadeh, B.; Awwad, F., **Sawan, M.** "On-Chip Electroporation: Characterization, Modeling and Experimental Results"

Miled, A.; **Sawan, M.**; "Electrode Robustness in Artificial Cerebrospinal Fluid for Dielectrophoresis-Based LoC".

**Boukadoum, M.**; Lahmiri, S. "Automatic Brain MR Images Diagnosis Based on Edge Fractal Dimension and Spectral Energy Signature".

Ghafar-Zadeh, E.; **Sawan, M.**, "Electroporation", Invited Session Organization, August 29, 2012.

Ghafar-Zadeh, E.; **Sawan, M.**, "Electrical Bio-interfaces", Invited Session Organization, August 29, 2012.

Ghafar-Zadeh, E.; **Sawan, M.**, "Electrical Fields at cell Protein Scale", Minisymposium Organization, August 30, 2012.