

**SIGNAL** is the main monthly information medium of the Microsystems Strategic Alliance of Québec (ReSMiQ). This newsletter aims to be an active link between the members of ReSMiQ and all individuals who have an interest in research and innovation in microsystems. We commit ourselves to promote in it our members' research and increase ReSMiQ's visibility.

**ReSMiQ** is a group of researchers in an interuniversity research center that can count on the support of the *Fonds de recherche du Québec - Nature et technologies* (FRQNT) and ten (10) Quebec universities involved in microsystems research.

In this issue we present you the news for the month of January 2014.

### Hiring a new scientific assistant

Following the departure of Mr. A. Miled, the management team of ReSMiQ has been supplemented with a new scientific assistant to the director in the person of Mr. Arnaldo Mendez, whose mandate is to help us to further increase the scope and impact of our local, international, industrial and academic activities.

### Hiring a part-time industrial liaison officer

We recently enlisted the services of a liaison officer in the person of Mr. Louis Bélanger. The main goal is to help us to create collaborative links between our center and potential industrial partners.

### Scientific poster competition

At our next annual symposium under the ACFAS conference, to be held at Concordia University on May 12, 2014, is included in the program a scientific poster competition for graduate students. The deadline for submission is February 7. [More details](#)

We invite our readers to visit our web site, [resmiq.org](http://resmiq.org), to know all the details about our upcoming activities.

Best regards,  
M. Sawan, Director

## RESMIQ ACTIVITIES

**Cours intensif ReSMiQ / SSCS Montréal / Dept. Génie élect.**  
*Label free biosensors and applications in frontier research*  
offered by prof. G. Rong de SJTU, Chine, February 14, 9:00AM  
at Polytechnique Montréal  
[More details](#)

## NEWS FROM OUR MEMBERS

### EXPOSURE

Dr. Gosselin from *Université Laval* will be editor for a special issue of the journal MDPI Sensors.

### ACHIEVEMENT

Dr. Lakhsasi from the *Université du Québec en Outaouais* received an I2I grant from NSERC for the project entitled *Fully automated tool for porting analog and mixed signal circuits within different technology process*.

[More details](#)

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



## SPOTLIGHT ON OTHER CONFERENCES

**2014 IEEE Latin American Symposium on Circuits and Systems (LASCAS)**, February 25 - 28, 2014, Santiago, Chile.  
[More details](#)

**2014 IEEE International Symposium on Circuits and Systems (ISCAS)**, June 1 - 5, 2014, Melbourne, Australia.  
[More details](#)

**2014 IEEE International Midwest Symposium on Circuits and Systems (MWSCAS)**, August 3 - 6, 2014, College Station, Texas, U-S-A  
[More details](#)

## OVERVIEW OF THE MEMBERS OF ReSMiQ AND THEIR RESEARCH CONTRIBUTIONS



**Prof. M. Omair Ahmad**  
Concordia University  
Regular member of ReSMiQ since 2001

Professor M. Omair Ahmad received the Ph.D. in Electrical Engineering from Concordia University. He was a professor at New York University College, USA. He joined Concordia University as an assistant professor of computer science. He was the Head of the Department of Electrical and Computer Engineering. He has published extensively in the field of signal and image processing and holds four patents, he is IEEE Fellow and President of the Montreal Chapter of the IEEE Circuits and Systems Society. He is a recipient of numerous honors and awards.

Below is a selection of publications in recent months followed by a representative paper of his work.

M. A. Haque, **M. O. Ahmad**, M. N. S. Swamy, M. K. Hasan, and S. Y. Lee, "Adaptive projection selection for computed tomography," IEEE Transactions on Image Processing, vol. 22, pp. 5085-5095, 2013. (abstract on right)

J. He, **M. O. Ahmad**, and M. N. S. Swamy, "Near-field localization of partially polarized sources with a cross-dipole array," IEEE Transactions on Aerospace and Electronic Systems, vol. 49, pp. 857-870, 2013.

O. Elbakry, **M. O. Ahmad**, and M. N. S. Swamy, "Inference of gene regulatory networks with variable time delay from time-series microarray data," IEEE/ACM Transactions on Computational Biology and Bioinformatics, vol. 10, pp. 671-687, 2013.

S. Bouguezzel, **M. O. Ahmad**, and M. N. S. Swamy, "Binary discrete cosine and hartley transforms," IEEE Transactions on Circuits and Systems I: Regular Papers, vol. 60, pp. 989-1002, 2013.

### Adaptive Projection Selection for Computed Tomography

M. A. Haque, **M. O. Ahmad**, M. N. S. Swamy, M. K. Hasan, and S. Y. Lee. IEEE Transactions on Image Processing, vol. 22, pp. 5085-5095, 2013.

The number of projections is a critical factor in tomographic imaging. The larger the number, the better the quality of the reconstructed image; however, it increases the radiation dose delivered to the patient. Therefore, it is important to keep the number of projections as small as possible. Traditionally, the projections are taken by moving the x-ray source around the patient at uniform angular steps. Taking projections at non uniform steps may result in better images as compared with that obtained using uniform projections. This paper describes two different approaches that adjust the step size to adaptively select the angle of projections. The first one is based on the spectral richness of the acquired projections and the second relies on the amount of new information added by successive projections. The superior performance of the two proposed methods (Fig. 1c and d) over the uniform projection scheme (Fig. 1b) is demonstrated through simulation results using both phantom and real images.

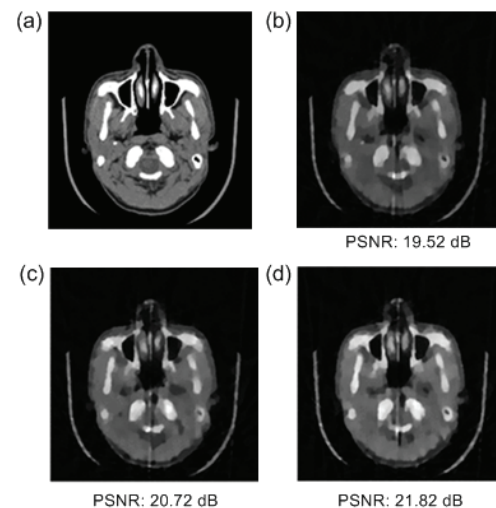


Fig. 1. Image reconstruction results for a medical image. (a) Original image. (b) Uniform projection scheme. (c) Algorithm 1. (d) Algorithm 2