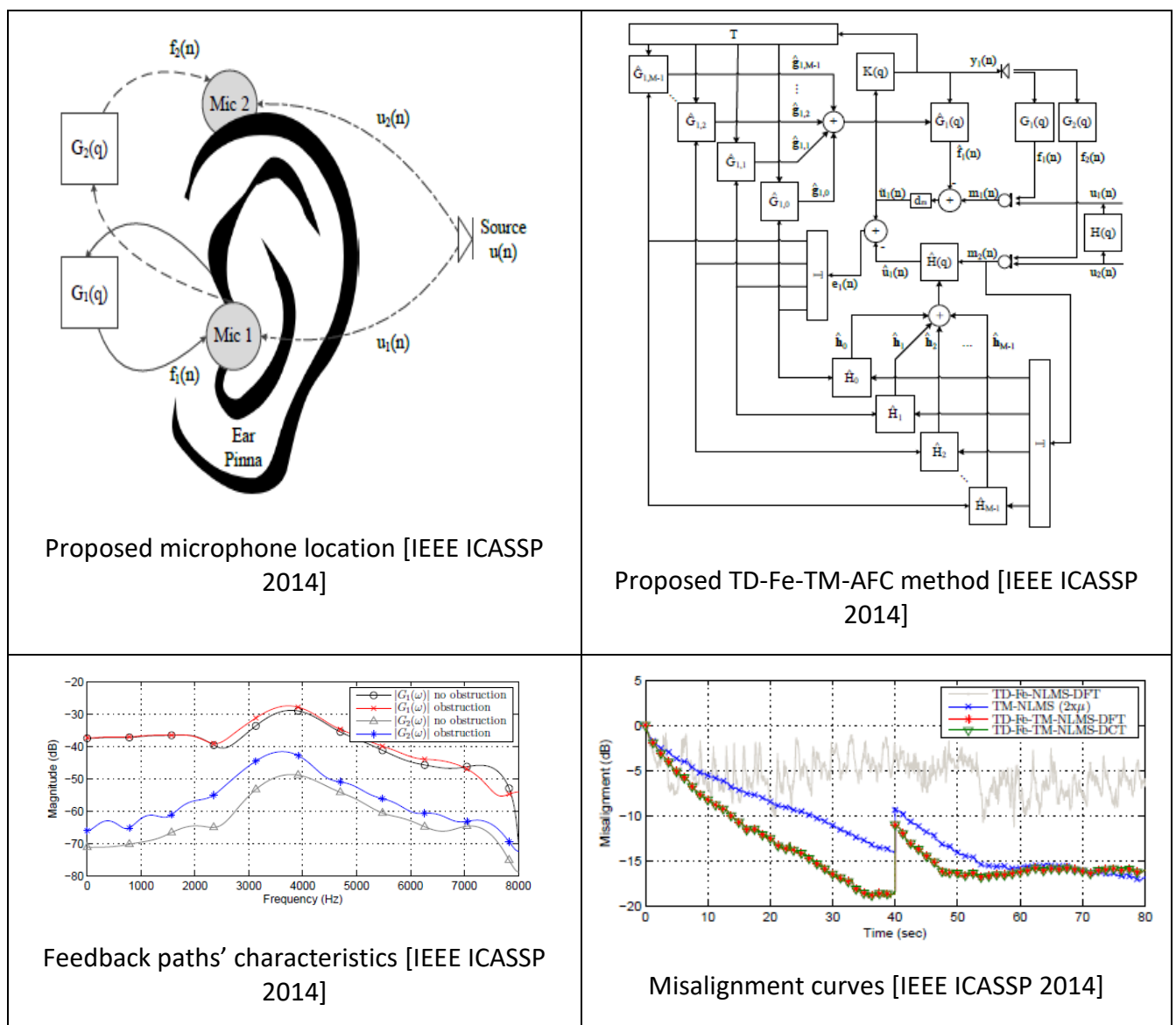
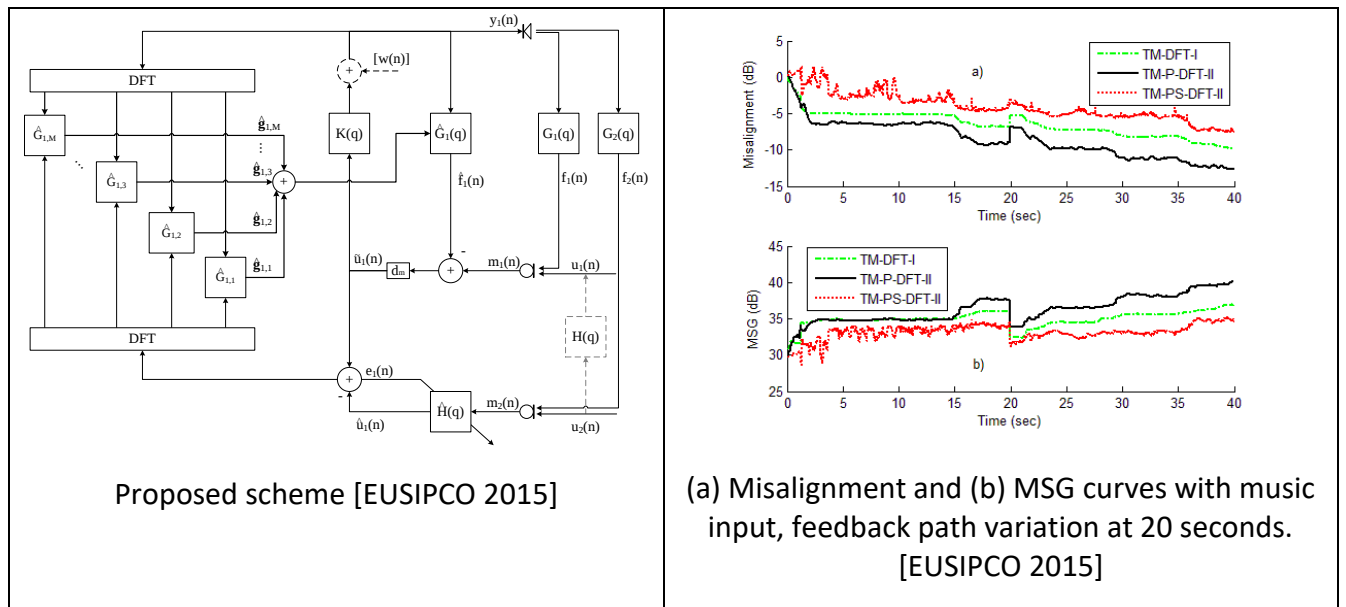


Our team has collaborated with other research teams from Australia, Spain, Japan, Italy, Canada, China, Brazil and USA. We've published six journal papers in journals with AIS > 0.5 with an accumulated 7.28 score (according to Thomson Reuters 2012 Journal Citation Reports). Also we've published 51 papers in prestigious conference proceedings. Our publications from 2012 to 2016 have already received about 100 citations (without self-citations).

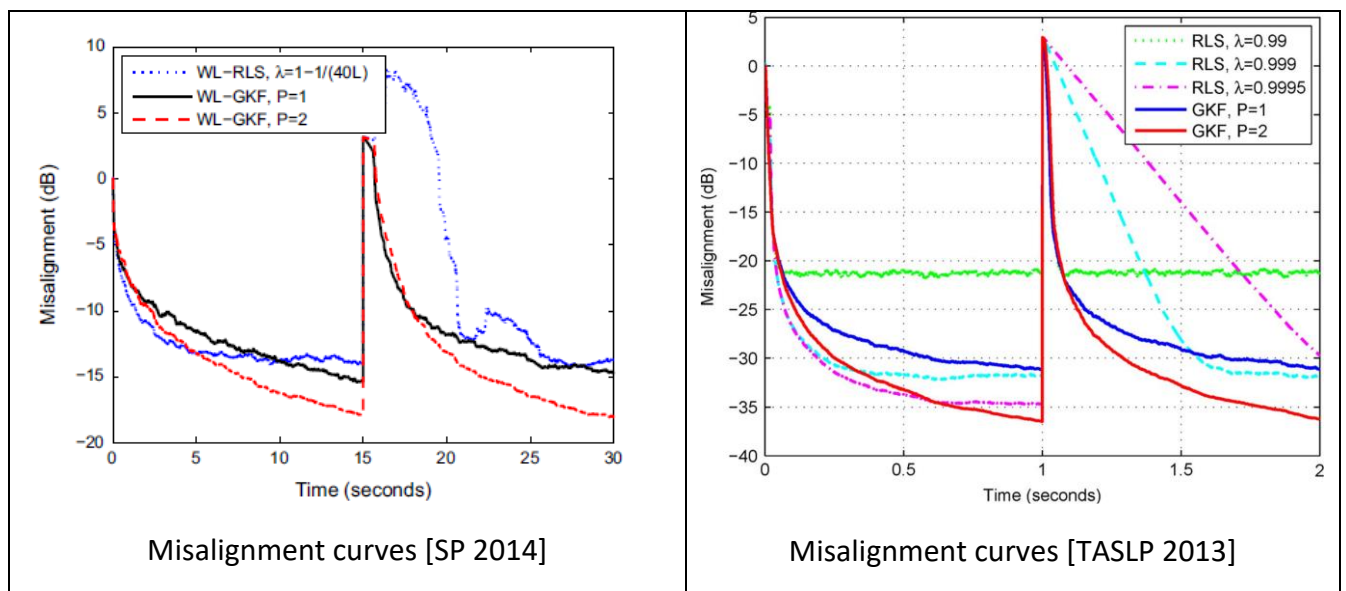
Most important research results:

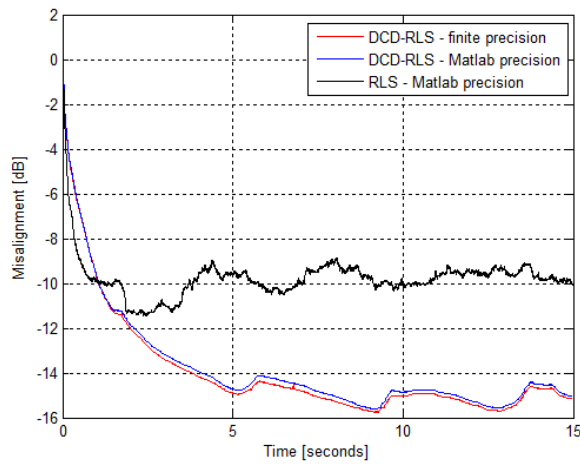
- In our joint work with a professor from Curtin University, Australia, and a researcher from the American manufacturer of digital hearing aids, Starkey Technologies, we studied the use of two microphones for acoustic feedback cancellation in hearing aids. An additional microphone was used to obtain an incoming signal estimate that was removed from the error signal prior to adapting the canceler. The use of orthogonal transforms and the proportionality principle were proposed, together with a bank of adaptive filters, each adapting to different portions of the spectrum. The influence of the subband numbers has been demonstrated. Up to 15 dB improvement was obtained.



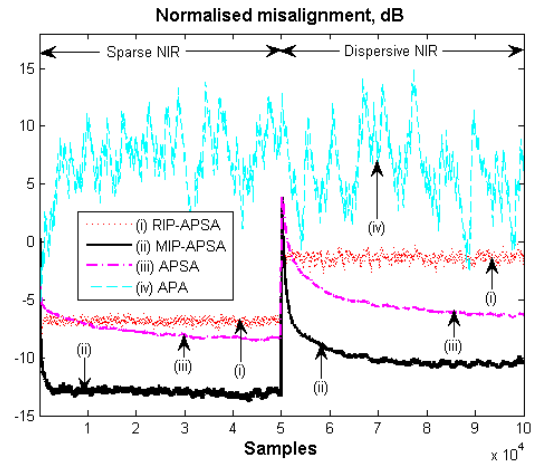


- We designed new algorithms based on DCD iterations, sign based algorithms and derived a different form of the Kalman filter by considering, at each iteration, a block of time samples instead of one time sample as it is the case in the conventional approach. We've shown that the general Kalman filter (GKF) is connected with some of the most popular adaptive filters i.e., the normalized least-mean-square (NLMS) algorithm, the affine projection algorithm (APA) and its proportionate version (PAPA). We've proposed the simplified Kalman filter and the WL model of the general form of the Kalman filter for SAEC. Also, we've proposed an optimized NLMS algorithm based on a joint-optimization on both the normalized step-size and regularization parameters, in the context of a state variable model. We've proposed new proportionate affine projection algorithms for system identification of "block-sparse" systems. Also, we've extended the "set-membership" approach with partial update to the pseudo affine projection algorithms.

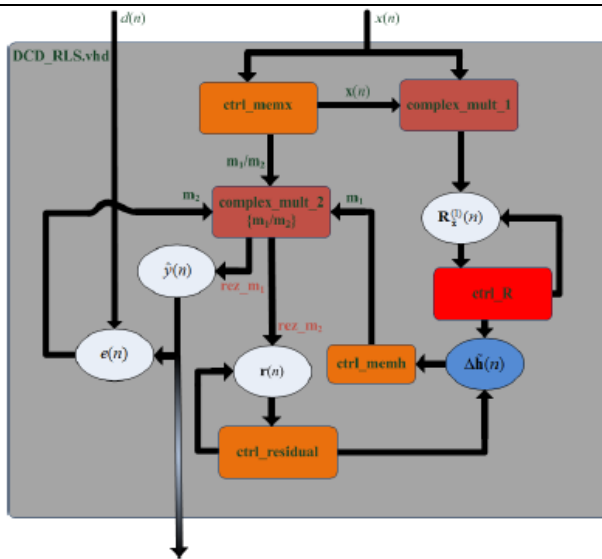




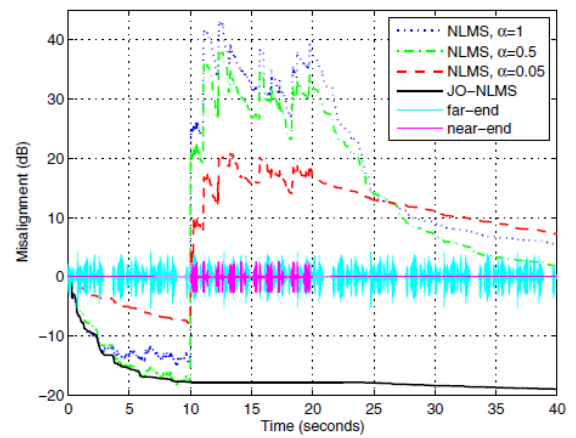
Misalignment curves [IEEE COMM 2014]



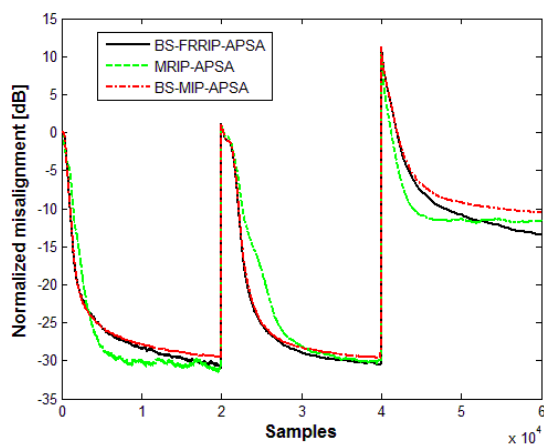
Misalignment curves [EL 2012]



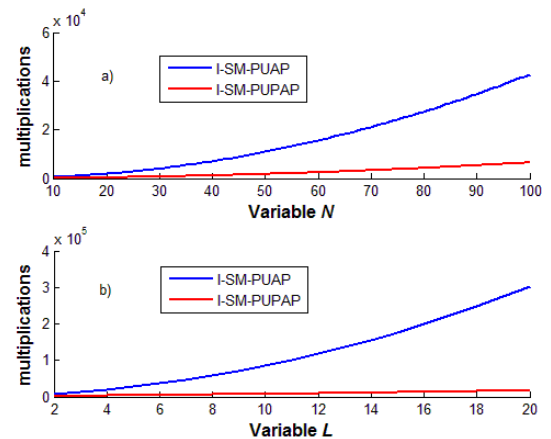
Proposed scheme [IEEE ISSCS 2015]



Misalignment curves [IEEE ISSCS 2015]



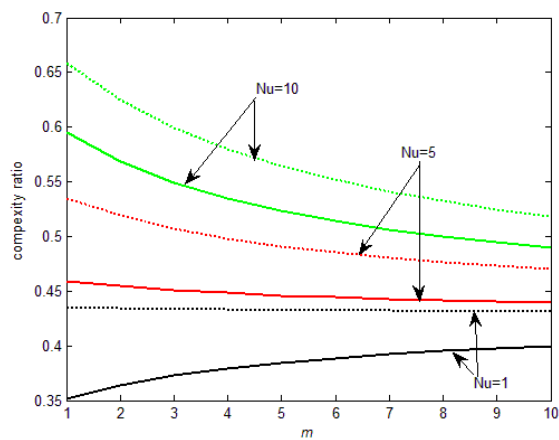
Miaslignment curves [IEEE COMM 2016]



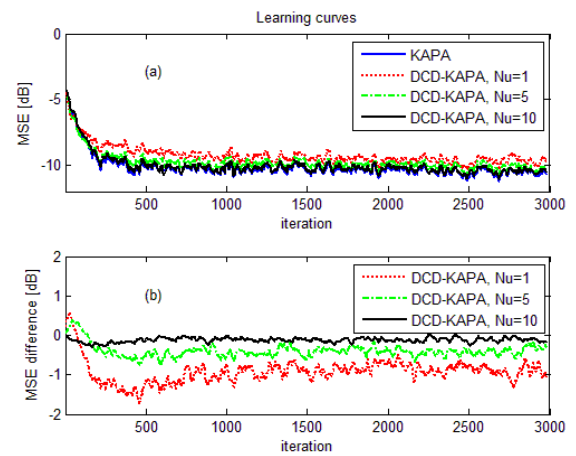
Numerical complexity of I-SM-PUAP and I-SM-PUPAP algorithms [IEEE ICACCI 2016]

- We've published eight papers together with a research team from Tokyo Metropolitan University, Japan. Also, we've published a chapter about the kernel based affine projection adaptive algorithms in a book of IGI-Global publisher. We designed new kernel based adaptive algorithms with

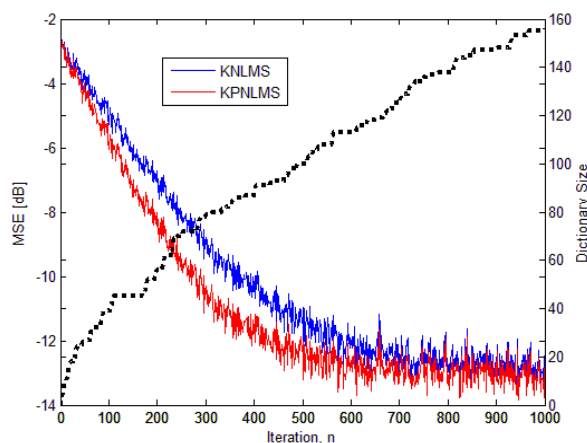
improved performances and minimal additional complexity. Also, we designed new fixed-budget versions of numerous types of algorithms (RLS, APA, PNLMS etc.) for applications with hardware or software constraints. We proposed a variable step size version of the KPNLMS algorithm. Also, we proposed a novel structure for implementing a kernel adaptive filter as an add-on component for a linear adaptive filter.



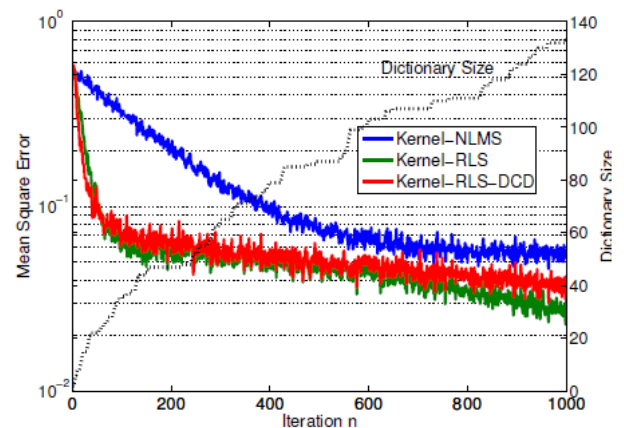
Complexity ratios comparison of DCD-KAPA/KAPA [IEEE ISPA 2013]



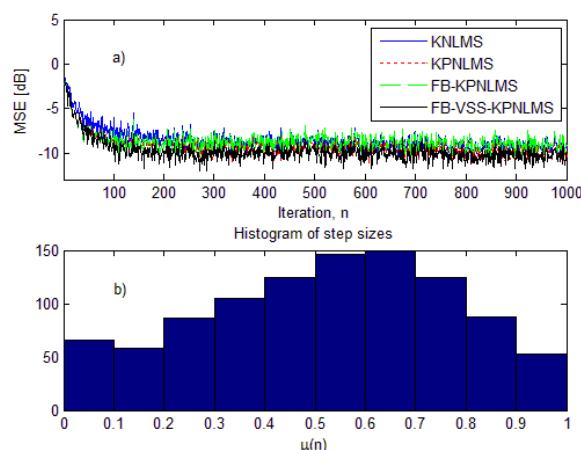
Comparison of convergence characteristics [IEEE ISPA 2013]



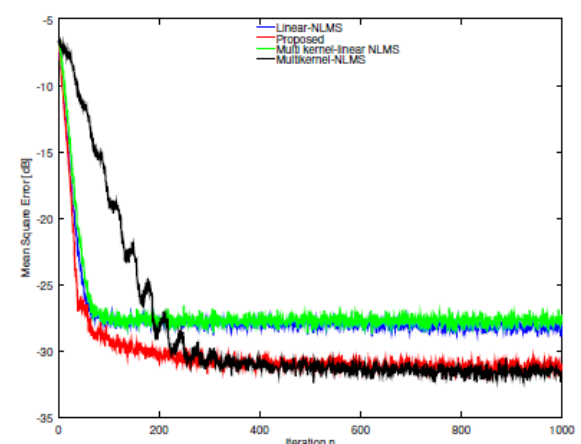
Comparison of convergence characteristics [EUSIPCO 2013a]



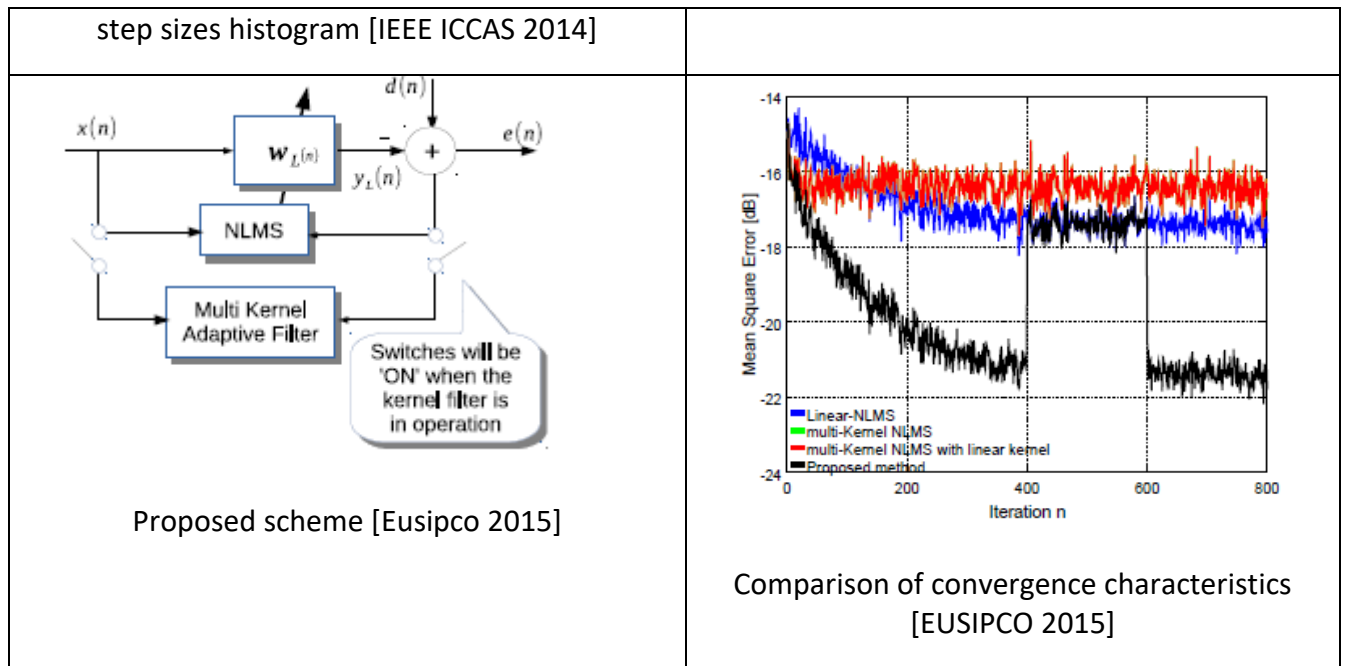
Comparison of convergence characteristics [IEEE APSIPA 2013]



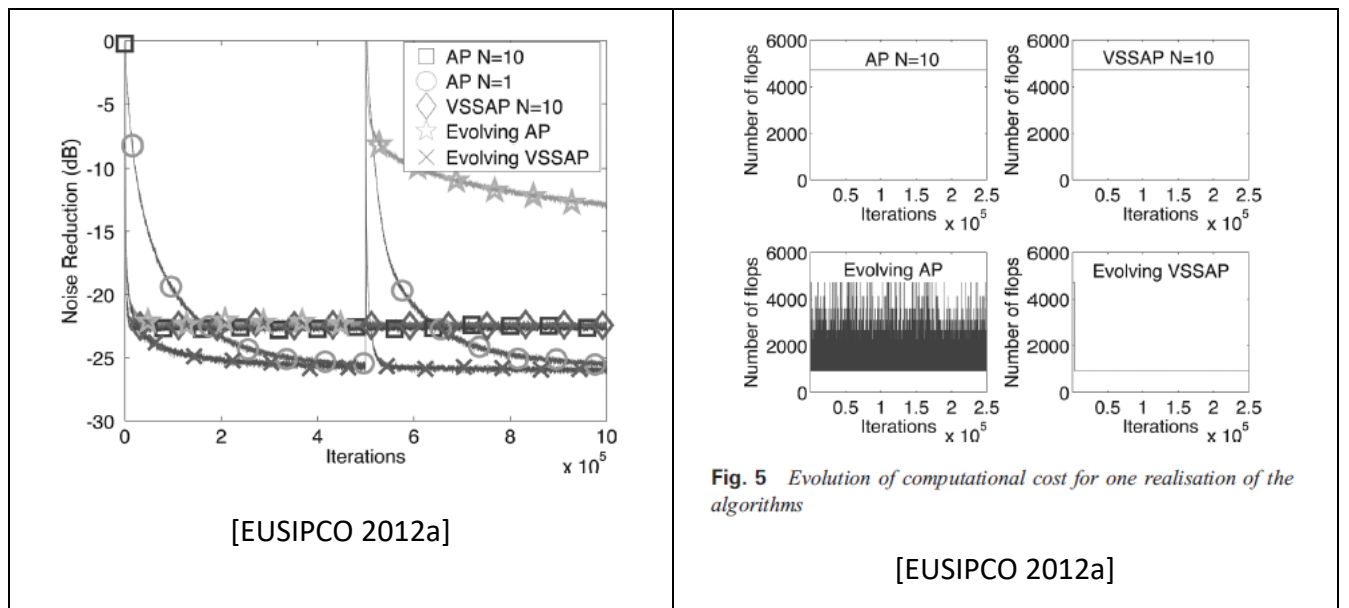
Comparison of convergence characteristics and

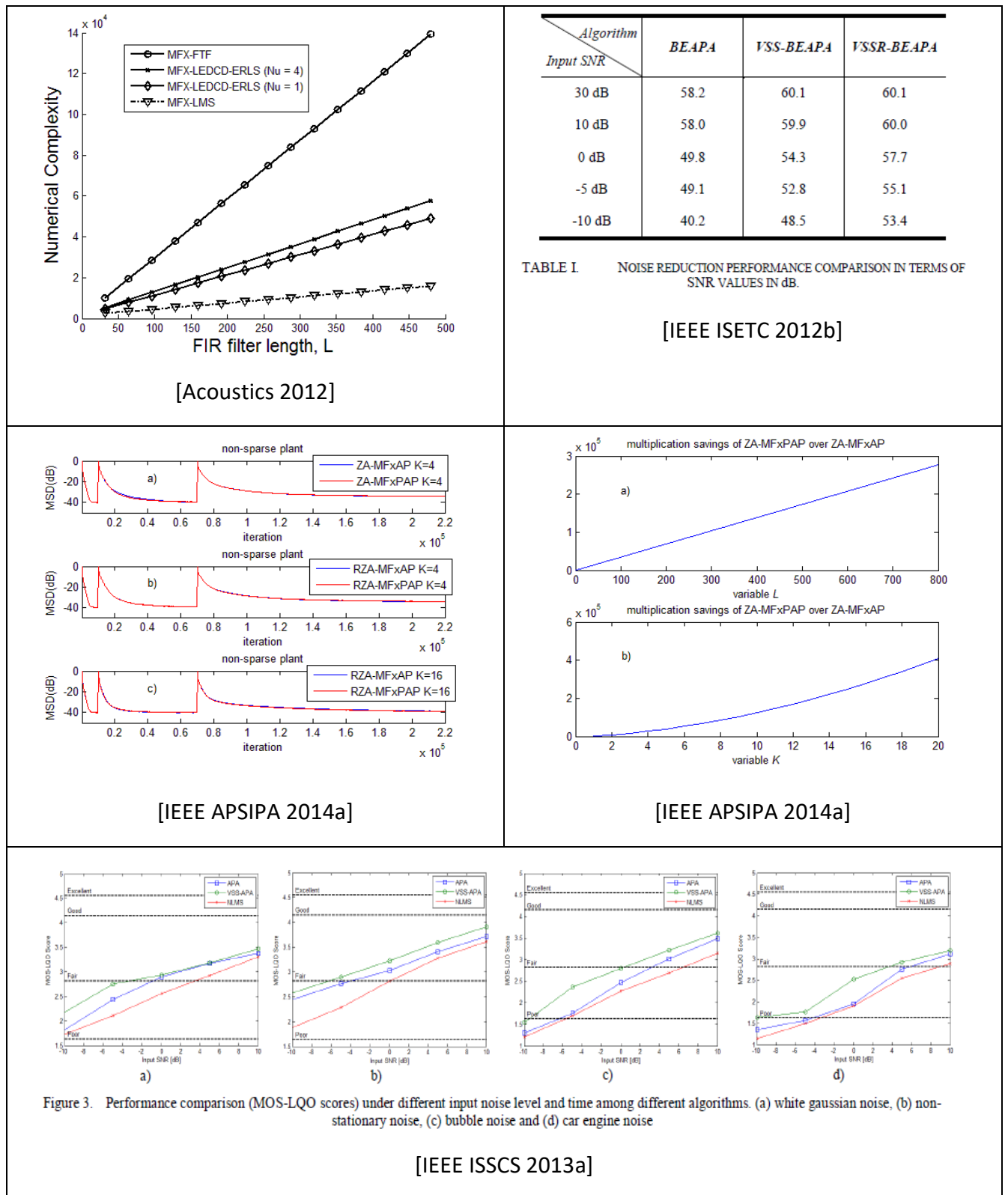


Comparison of convergence characteristics [IEEE APSIPA 2014b]



- We designed performant algorithms for active noise control in different settings. We obtained superior performances in case of strong noise levels (up to 15 dB SNR improvement). Also, we proposed new algorithms for ANC whose numerical complexity was up to four times smaller than the algorithms with similar performance. We collaborated with research teams from Politehnica University of Valencia, Spain, Sapienza University of Rome, Italy and University of York, Great Britain.





- We've published in prestigious journals such as Elsevier Signal Processing, IEEE Transactions on Audio, Speech and Language Processing, IET Signal processing and IET Electronics Letters.
- We've published in prestigious conferences of IEEE Signal Processing Society (ICASSP 2012, ICASSP 2013, ICASSP 2014), IEEE Circuits and Systems Society (ISCAS 2013), EURASIP (EUSIPCO 2012, EUSIPCO 2013, EUSIPCO 2015, EUSIPCO 2016), IEEE Control Systems Society (IEEE ICCAS 2014, IEEE ICARCV 2012) etc.
- The PI (prof. Felix Albu) has obtained in 2013 the Senior Member status from IEEE and received many invitations to act as a reviewer or TPC for numerous international journals and conferences.

- Since 2013, the PI has been an expert evaluator for MAT/ENG panels in FP7 and H2020 research programs.
- In 2014, the PI and prof. Constantin Paleologu have received the “habilitation” in Electronics and Telecommunications.
- Since 2015, the PI has become an Associate Editor of the Pattern Analysis and Applications Springer Journal.
- In 2016, the Felix Albu has been promoted as a professor at Valahia University of Targoviste.
- The PI has received the best presentation award at IEEE ICCAS 2014, Seoul, South Korea and the best paper award at IEEE SPA 2014, Poznan, Poland.
- The PI has organized a special session at EUSIPCO 2012 conference from Bucharest together with a team from Politehnica University of Valencia (Alberto Gonzales, Miguel Ferrer si Maria de Diego).
- The PI has organized a special session at ECAI 2015 conference from Bucharest together with Dr. Stefania Cecchi from Universita Politecnica delle Marche, Ancona, Italy.
- The PI has organized a special session at IEEE APSIPA 2015 conference from Hong Kong together with prof. Kiyoshi Nishikawa from Tokyo Metropolitan University, profs. Li Xu and Guan Gui from Akita Prefectural University, Japan.
- The team has implemented several proposed algorithms on FPGA systems. The envisaged applications were noise reduction and adaptive feedback cancellation. The practical implementations confirmed the Matlab simulation results.
- Two young PhD researchers from the team, Marius Rotaru and Cristian Stanciu, published one journal paper and 11 conference papers. Both defended their PhD thesis in 2013 and 2014 respectively. Large parts of their PhD thesis included the research made during this project. Dr. Cristian Stanciu has become a lecturer and a part of his application file included his achievements in the project.