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Current Situation

- I am currently a research scientist in the Communication Systems Group at Darmstadt University of Technology, Germany. My research interests include statistical signal processing and estimation/detection theory with applications to array signal processing (performance analysis and source localization) and radio astronomy (eye-fish observing with array radio telescope).
- I was a PhD Student in the Modelling and Statistical Signal Processing group in the Laboratory of Signals and Systems (L2S) at Paris Sud Orsay University (CNRS, Supélec, France). My advisors were Sylvie Marcos (director of research at CNRS), Rémy Boyer (assistant professor) and Alexandre Renaux (assistant professor). My PhD topic has concerned the multidimensional statistical resolution limit, minimal bounds for near-field source localization and direction of arrivals estimation.

Scientific interests

- Statistical signal processing (array signal processing and radio astronomy),
- Physical parameters estimation (Far field and near field source localization),
- Asymptotic and non-asymptotic estimators performance (MSE, statistical resolution limit, threshold analysis),
- Minimal Bounds on the MSE (Deterministic and Bayesian).

Teaching Experience

2010–2011	Signal Processing (60h) : Paris Sud Orsay University. Courses : Discret and Fast Fourier Transform, Sampling, MatLab 101, Digital Filtering.
2009–2010	Digital Electronic (109h) : Paris Sud Orsay University. Courses : C/C++, VHDL, PLD/FPGA design.
2008–2009	Analog Electronic (64h) : Paris Sud Orsay University. Courses : DC and AC circuits, Diode and Transistor, Bode diagram, Analogue filter desing.

Publications

Journal papers

[J1] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "Conditional and unconditional Cramér-Rao bounds for near-field source localization", *IEEE Transactions on Signal Processing*, Volume : 58, Issue : 5, May 2010, pp. 2901-2907.

[J2] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "Statistical Resolution Limit of the Uniform Linear Cocentered Orthogonal Loop and Dipole Array", *IEEE Transactions on Signal Processing*, Volume : 59, Issue : 1, Jan 2011, pp. 425-431.

[J3] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "Statistical Resolution Limit for the Multidimensional Harmonic Retrieval Model : Hypothesis Test and Cramer-Rao Bound Approaches", *EURASIP Journal on Advances in Signal Processing*, special issue on "Advances in Angle-of-Arrival and Multidimensional Signal Processing for Localization and Communications", 2011, 2011 :12.

[J4] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "A Statistical Analysis of Achievable Resolution Limit in the Near Field Context Using Nonuniform and Lacunar Array", *Elsevier Signal Processing*, Volume 92, Issue 2, February 2012, Pages 547-552.

[J5] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "Statistical Resolution Limit for Source Localization With Clutter Interference in a MIMO radar Context", to appear in *IEEE Transactions on Signal Processing*.

Journal papers : in revision or submitted

[J6] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "On the Asymptotic Statistical Resolvability Of Point Sources in Subspace Interference Using a GLRT-Based Framework", accepted under major revision in *Elsevier Signal Processing*.

[J7] D. T. Vu, M. N. El Korso, R. Boyer and S. Marcos, "Bayesian Statistical Resolution Limit based on Information and Detection theories", Submitted to *IEEE Transactions on Signal Processing*.

[J8] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "Deterministic Performance Bounds on the Mean Square Error for Near Field Source Localization", Submitted to *IEEE Transactions on Signal Processing*.

[J9] M. N. El Korso, R. Boyer and S. Marcos, "Fast Sequential Direction Of Arrival Finding Using the Projected Companion Matrix", Submitted to *Digital Signal Processing*.

Conference Papers

[C1] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "Non-matrix closed form expressions of the Cramér-Rao bounds for near-field localization parameters", in Proc. of *IEEE International Conference on Acoustics, Speech, and Signal Processing, ICASSP-09*, Taipei, Taiwan.

[C2] M. N. El Korso, G. Bouleux, B. Boyer and S. Marcos, "Sequential estimation of the range and the bearing using the zero-forcing MUSIC approach", in Proc. of *the 17th European Signal Processing Conference, EUSIPCO-09*, Glasgow, Scotland.

[C3] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "Expressions non-matricielle des bornes de Cramér-Rao pour la localisation de source en champ proche", in Proc. of *Colloque GRETSI 2009*, Dijon, France.

[C4] M. N. El Korso, B. Boyer and S. Marcos, "Sequential Source Localization Using the Projected Companion Matrix Approach", in Proc. of *IEEE Workshop on Computational Advances in Multi-Sensor Adaptive Processing, CAMSAP-09*, Aruba, Dutch Antilles.

[C5] M. N. El Korso, G. Bouleux, B. Boyer and S. Marcos, " Estimation séquentielle des paramètres de localisation en champ proche à l'aide de l'approche Zero-Forcing", in Proc. of *Colloque GRETSI 2009*, Dijon, France.

[C6] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "Statistical resolution limits for multiple parameters of interest and for multiple signals", in Proc. of *IEEE International Conference on Acoustics, Speech, and Signal Processing, ICASSP-10*, Dallas, TX, USA.

- [C7] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "Statistical Resolution Limit : Application to Passive Polarized Source Localization", in Proc. of Detection, Architecture and Technology *Workshop DAT-2011*, Algiers, Algeria.
- [C8] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "Statistical resolution limit for source localization in a MIMO context", in Proc. of *IEEE International Conference on Acoustics, Speech, and Signal Processing, ICASSP-11*, Prague, Czech Republic.
- [C9] M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, " A GLRT-based framework for the multidimensional statistical resolution limit", in Proc. of *IEEE Workshop on Statistical Signal Processing, SSP-11*, Nice, France.
- [C10] T. D. Vu, M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, "Angular Resolution Limit for Vector Sensor Arrays : Detection and Information Theory Approaches", in Proc. of *IEEE Workshop on Statistical Signal Processing, SSP-11* in the special issue *Polarized Signal Processing*, Nice, France.
- [C11] T. D. Vu, M. N. El Korso, R. Boyer, A. Renaux and S. Marcos, " Résolution limite angulaire Approches basées sur la théorie de l'information et sur la théorie de la détection", *GRETSI-11*, Bordeaux, France.
- [C12] M. N. El Korso, A. Renaux, R. Boyer and S. Marcos, "Bornes inférieures de l'erreur quadratique moyenne pour la localisation de sources en champ proche", *GRETSI-11*, Bordeaux, France.

Talks and Seminar

- [T1] "Multidimensional Resolution Limit : A Survey and Applications", Signal Processing Summer School, June 2010, Peyresq, France.
- [T2] "Statistical resolution limits for multiple parameters of interest and for multiple signals", The Ph.D. students day of the Laboratory of signals and systems, June 2010, Les Loges-en-Josas, France.
- [T3] "On the Statistical Resolution Limit and its Application in Array Signal Processing : Overview and Survey", Laboratory of signals and systems, July 2009, Gif-Sur-Yvette, France.
- [T4] "Asymptotic estimators performance in the near field context", The Ph.D. students day of the Laboratory of signals and systems, June 2009, Gif-Sur-Yvette, France.

Others

- [O1] "*Different techniques comparison for the estimation of the instantaneous frequency*", Final Engineering Project, Ecole Centrale Marseille, 09 Septembre 2007.
- [O2] "*Passive source localization*", Master Project, Université Paris Sud-11, 24 June 2008.
- [O3] "*Analyse de performance en traitement d'antenne. Bornes inférieures de l'erreur quadratique moyenne et seuil de résolution limite*", Ph.D. Dissertation, Université Paris Sud-11, 07 July 2011.