Short Biography

Pr. Doz. Dr. habil. M.Sc. MBA
Aref Lakhal

Aref is the Managing Director of the ΛΠ− Institute for Quantitative Exploration, a consulting and market-driven R & D institute operating at the intersection of Business Management, Technology and Innovation. The ΛΠ− Institute provides functional expertise and holistic services in strategy, marketing, finance, organisation, operations and the management of innovation, R & D, technology, transformation and sustainability.

Having a hybrid background in Engineering Mathematics and Business Management, credentialed by a Venia Legendi and a PhD in Applied Mathematics in addition to a MBA in International Management, Aref is also an advisor, academic and innovation manager. Over 20 years of professional experience in innovation and knowledge management and hands-on development of numerous interdisciplinary projects, in close collaboration with renowned technology-transfer institutions such as the German Aerospace Center (DLR) and the Fraunhofer Institutes, consolidate his know-how on the creation, transfer and capture of value from innovation to profitable technology-based entrepreneurship.

His expertise includes data-analytic intelligence, value-uncertainty quantification, scientific computing, predictive-prospective analysis and visualization as well as the application of quantification and computing technologies in multitudinous industries ranging from smart engineering and bio-medical technologies to quantitative finance and market making. Furthermore, he has a funded know-how on value creation through implementing quantitative intelligence across value chains for improving decision making, enhancing performance and driving profitable growth. He is also practised in integrative development across international value chains and technology marketing in emerging markets.

Selected Scientific Publications

[1] *A Direct Method for Nonlinear Inverse Problems*, (2018) Inverse Problems 34 025002, https://doi.org/10.1088/1361-6420/aa91e0

[2] *Inverse Design of Anti-Reflection Coatings using the Nonlinear Approximate Inverse*, in Inverse Problems in Science and Engineering, Vol 24, Issue 6 (2016) 917-35, with M Alakel-Abazid and A K Louis

[3] *A Stable Numerical Algorithm for the Design of Anti-Reflection Coatings for Solar Cells*, International Journal of Renewable Energy Technology, 7, 97-111, 2016, , with M A. Abazid, A K Louis

[4] *The Approximate Inverse and Sobolev-estimates for the Attenuated Radon Transform* (2015) Inverse Problems, Volume 31, Number 10, with G Rigaud
Highlight Paper *Inverse Problems* **2015**

[5] *Kairuain-algorithm applied on electromagnetic imaging*, Inverse Problems 29 (2013) 095001
Highlight Paper *Inverse Problems* **2013**

[6] *Reconstruction Methods for Severely Ill-posed and Nonlinear Inverse Problems Applied on Electromagnetics, Medical Imaging and Finance*, Habilitation Thesis, Saarland University, 2015

[7] *Series Expansions of the Reconstruction Kernel of the Radon Transform over a Cormack-Type Family of Curves with Applications in Tomography*, SIAM Journal on Imaging Sciences, 7(2), 924-43 (2014), with A.K. Louis and G. Rigaud.

[8] *Non-Destructive Testing of Anti-Reflection Coatings for Solar Cells*, Proceedings of the European Workshop on Renewable Energy Systems (EWRES), (2013) with M Alakel-Abazid and A K Louis

[9] *A decoupling-based imaging method for inverse medium scattering for Maxwell's equations''*Inverse Problems' 26 (2010), 015007 (17pp)
Highlight Paper *Inverse Problems* **2010**

[10] *A new reconstruction method for inverse medium scattering'*, in Mathematics and Algorithms in Tomography, Oberwolfach Seminars, Springer. DOI: 10.4171/OWR/2010/18.

[11] *Image and feature reconstruction for the attenuated Radon transform via circular harmonic decomposition of the kernel*, Inverse Problems **31** 025007,(2015), with G Rigaud

[12] *Calibrating local volatility in inverse option pricing using the Levenberg-Marquardt method*, Journal of Inverse and Ill-posed Problems, 18 ausg. 5 (2010), with Lakhal M M and Louis A K

[13] *Locating radiating sources for Maxwell's equations using the approximate inverse*, Inverse Problems, 24 (2008/04), 045020 (18pp), with A K Louis.
Highlight Paper *Inverse Problems* **2008**

[14] *Probabilistic kernels for uncertainty quantification of a stochastic source in an elliptic differential equation*, Preprint

[15] *Adaptive inverse modeling for opto-acoustic imaging*, Preprint

Education

Saarland University:
PhD (Dr. rer. nat.) in Applied Mathematics
Venia Legendi, Habilitation in Mathematics

Kaiserslautern University:
M.Sc. in Industrial Mathematics

European School of Business (ESB):
MBA in International Management