Unclassified

Dr. Roger Alimi

Technologies Division
Systems Department
Soreq, NRC
Yavneh 81800, Israel

Office Phone: +972-8-9434858
Mobile: +972-50-6292243
E-mail: roger@soreq.gov.il
alimiroger@gmail.com

Academic Education

Ph.D	1991	Theoretical Chemistry	Hebrew University Of Jerusalem
M.Sc	1986	Theoretical Chemistry	Hebrew University Of Jerusalem
B.Sc	1984	Mathematics	Hebrew University Of Jerusalem

Ph. D. Thesis:
R. Alimi: *Theoretical Studies of Molecular Reaction Dynamics in Solids*, The Hebrew University of Jerusalem, 1990. Supervisor: Prof. R.B. Gerber.

1. Current Position

Senior scientist, Head of the Algorithm Development Group of the Technologies Division at the Soreq Nuclear Research Center. Leader and manager of the development of algorithms embedded in operational systems for a wide variety of R&D projects.

2. Core Fields of Expertise

- Applied mathematics (Non-linear optimization, Inverse problems)
- Computational Physics (Modeling and Simulation)
- Digital Signal Processing (Time and Spectral Analysis, Filtering, Fourier, Radon, Wavelets, TFR, Wigner-Ville)
- Natural Computing (Genetic Algorithms, Particle Swarm Optimization)
- Machine Learning (Unsupervised Fuzzy Clustering, Support Vector Machine, Deep Learning)

3. Professional Experience (10 past years only)

From 2013 To present

- Development of algorithms and computational tools for various R&D projects, including both classical and meta-heuristic schemes for non-linear optimization and inverse problems.
- Intensive work on Evolutionary Algorithms (dedicated Genetic Algorithms and Particle Swarm Optimization), Neural Networks (Deep Learning), supervised classifiers (Support Vector Machine) and unsupervised models (Clustering).
- Main applications include: magnetic signal processing, automatic optical fiber alignment systems, white light interferometry and Sweep Frequency Response Analysis (polynomial chirp parameters extraction).

From To

2012	2013	Sabbatical Year at the Hoshen Eliav System Engineering Ltd. Company: • Development of various image processing tools for a sophisticated simulator of thermal cameras, including turbulent current effects. • Fuzzy logic clustering for unsupervised pattern recognition.
2006	2011	• Digital signal processing of magnetometers output for magnetic surveys of various types of areas. The research included deterministic schemes like Levenberg-Marquardt Algorithm as well as dedicated Genetic Algorithms. • Intensive use of various filtering processes and spectral analysis tools, like wavelets, Radon transform, Time-Frequency FT and more.
2008	2010	• Three dimensional reconstruction of phase plate topography by solving the Transport Intensity Equation (TIE). • Algorithms and codes for both classical Poisson differential equation (using a Multi Grid solver) and Zernike polynomial approach have been developed.

4. Education and Training

Expertise on numerical analysis of physical processes, modelling and algorithms development. Wide experience on DSP for various applications. Intensive programming in Matlab for Natural Computing and Machine Learning. Work in both Windows and Linux environment.

5. Mentoring

2018:	Supervision of Physics High School Diploma Thesis (*Gravitational Lensing*)
2014-2016:	Supervision of Master's Degree Thesis of Tsuriel Ram-Cohen, Faculty of Engineering, Bar Ilan University, *Characterization and detection of oscillating magnetic dipole signals*
2016:	Supervision of Physics High School Diploma Thesis (*Black Holes and GA*)

6. Last Major Awards

2020 Outstanding Employee Award of the Civil Service Commission (נציבות שירות המדינה)

2019: Certificate of Appreciation from the IMOD (מפא"ת)

2018: Israel Defense Prize (Israel Defense Award)

2018: Outstanding Employee Award of the Israeli Atomic Energy Commission

2017: IMOD Director Prize for "Creative Thinking"

2016: Outstanding Team Award of the Soreq Nuclear Research Center