# PROF. OFER M. SHIR

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- **HIGHER EDUCATION**

2008-2010 Princeton University, Department of Chemistry, Postdoctoral Research Associate. Host: **Prof. Herschel Rabitz**. Project title: Optimization, learning and search in quantum control theory and experiments.

2004-2008 Leiden University, Leiden Institute of Advanced Computer Science, PhD, Computer Science. Advisors: **Prof. Thomas Bäck** and **Prof. Marc Vrakking** (Amolf/FOM), Thesis title: "Niching in Derandomized Evolution Strategies and its Applications in Quantum Control" [ISBN: 978-90-6464-256-2]

2003-2004 Leiden University, Leiden Institute of Advanced Computer Science, MSc, Computer Science. Advisor: **Prof. Thomas Bäck**, Thesis title: "Niching in Evolution Strategies".

2000-2003 Hebrew University of Jerusalem, BSc, Physics and Computer Science

- **CURRENT POSITIONS**

2026 – Tel-Hai University, Computer Science Department, Full Professor

2013 – The Galilee Research Institute - Migal, Computational Sciences, Principal Investigator

- **PREVIOUS POSITIONS**

2024 University of Jyväskylä, Adjunct Professor, The Jyväskylä Summer School

2022—2023 Technion – Israel Institute of Technology, Faculty of Mathematics, Visiting Associate Professor

2019 – 2022 Tel-Hai College, Computer Science Department Head

2012 – 2026 Tel-Hai College, Computer Science Department, Lecturer, Senior Lecturer and Associate Professor

2010 – 2013 IBM Research, Software and Services, Research Scientist

- **SELECTED PEER-REVIEWED PUBLICATIONS** (complete list of publications: Google Scholar)

★ Zepko, G., **Shir, O.M.**: All-Quadratic Mixed-Integer Problems: A Study on Evolution Strategies and Mathematical Programming. Evolutionary Computation Journal **34**(2) (2026) 235—260

★ **Shir, O.M.**, Emmerich, M.: Foundations of Correlated Mutations for Integer Programming. In: Proceedings of the 18th ACM/SIGEVO Conference on Foundations of Genetic Algorithms, FOGA-2025, New York, NY, USA, ACM Press (2025) 285–296

★ Emmerich, M., **Shir, O.M.**, Wang, H.: Evolution Strategies. In: Handbook of Heuristics. Springer Cham (2025) DOI

★ **Shir, O.M.**, Emmerich, M.: Multi-Objective Mixed-Integer Quadratic Models: A Study on Mathematical Programming and Evolutionary Computation. IEEE Transactions on Evolutionary Computation **29**(3) (2025) 661—675

★ **Shir, O.M.**, Israeli, A., Caftory, A., Zepko, G., Bloch, I.: Algorithmically-guided discovery of viral epitopes via linguistic parsing: Problem formulation and solving by soft computing. Applied Soft Computing **129** (2022) 109509

★ **Shir, O.M.**, Yazmir, B., Israeli, A., Gamrasni, D.: Algorithmically-Guided Postharvest by Experimental Combinatorial Optimization. In: Proceedings of the Genetic and Evolutionary Computation Conference Companion, NY, USA, ACM Press (2022) 2027–2035

★ **Shir, O.M.**, Xi, X., Rabitz, H.: Multi-level evolution strategies for high-resolution black-box control. Journal of Heuristics **27**(6) (2021) 1021—1055

★ **Shir, O.M.**, Yehudayoff, A.: On the covariance-Hessian relation in evolution strategies. Theoretical Computer Science **801** (2020) 157—174

★ Horesh, N., Bäck, T., **Shir, O.M.**: Predict or Screen Your Expensive Assay? DoE vs. Surrogates in Experimental Combinatorial Optimization. In: Proceedings of the Genetic and Evolutionary Computation Conference, NY, USA, ACM Press (2019) 274—284

★ Israeli, A., Emmerich, M., Litaor, M., **Shir, O.M.**: Statistical Learning in Soil Sampling Design Aided by Pareto Optimization. In: Proceedings of the Genetic and Evolutionary Computation Conference, GECCO-2019, NY, USA, ACM Press (2019) 1198—1205

★ Nanda, V., Belure, S.V., **Shir, O.M.**: Searching for the Pareto frontier in multi-objective protein design. Biophysical Reviews **9**(4) (2017) 339—344

★ **Shir, O.M.**, Roslund, J., Whitley, D., Rabitz, H.: Efficient Retrieval of Landscape Hessian: Forced Optimal Covariance Adaptive Learning. Physical Review E **89**(6) (2014) 063306

★ **Shir, O.M.**: Niching in Evolutionary Algorithms. In: Handbook of Natural Computing: Theory, Experiments, and Applications. Springer-Verlag, Berlin-Heidelberg, Germany (2012) 1035—1069

★ **Shir, O.M.**, Emmerich, M., Bäck, T.: Adaptive Niche-Radii and Niche-Shapes Approaches for Niching with the CMA-ES. Evolutionary Computation **18**(1) (2010) 97–126

★ **Shir, O.M.**, Preuss, M., Naujoks, B., Emmerich, M.: Enhancing Decision Space Diversity in Evolutionary Multiobjective Algorithms. In: Proceedings of Evolutionary Multi-Criterion Optimization: Fifth International Conference (EMO 2009). Volume 5467 of Lecture Notes in Computer Science., Springer (2009) 95–109

★ **Shir, O.M.**, Beltrani, V., Bäck, T., Rabitz, H., Vrakking, M.J.: On the Diversity of Multiple Optimal Controls for Quantum Systems. Journal of Physics B: Atomic, Molecular and Optical Physics **41**(7) (2008) 074021