Dr. Ronen Benjamine Kopito

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Professional Summary

I am an experienced experimental physicist, researcher, and data scientist with a robust background in sensory systems, machine learning (ML), signal processing, data modeling&analysis. I have a proven track record of developing sophisticated ML and computational models, and advanced algorithms development across diverse applications, including brain-computer interfaces, biomedical devices, and more. I bring expertise in advanced research, experimental design, and developing innovative solutions across diverse disciplines. I have consistently demonstrated my ability to manage and lead projects successfully, whether working independently or as part of a collaborative team. I am skilled in coordinating tasks, setting priorities, and driving project outcomes to meet objectives and deadlines.

Domain knowledge

- Biomedical & Biotechnology
- Neurotechnology & Brain-Computer Interfaces (BCI)
- Biophysics and Systems Biology
- Multidimensional sensory systems
- Fluorescence microscopy and lab-on-chip
- Experimental design and scientific research
- Interdisciplinary integration

Technical Skills

- Programming & Scripting: Python (NumPy, SciPy, scikit-learn, pandas), MATLAB, C++ (long time ago), LabVIEW

- Machine Learning: Supervised, Unsupervised, statistical analysis, modelling, TensorFlow, XGBoost, Random Forest, CCA, clustering, feature engineering, …

- Signal / Image processing & Analysis: All types of signals (Images, EEG, ECG, PPG, Gyro, time series), denoising, frequency analysis, forecasting, …

- Real-time data acquisition, clinical/real-world settings

- Diverse sensory systems, wearable sensors

- Data Tools & Platforms: Jupyter, Git, SQL, AWS

Professional Experience

Senior data scientist | Arctop   **Los-Angeles 2023-2024**
                                                     Tel-Aviv   2017-2021

Led pioneering algorithm development for real-time EEG-based brain-computer interfaces (BCI).

❏ Designed end-to-end ML pipelines to detect and predict complex cognitive states full ML.

❏ Developed a real-time signal processing suite for denoising and automated Quality Assurance (QA).

❏ Engineered biomedical algorithms to extract physiological metrics, including heart rate, HRV, blink rate, and motion artifacts.

Senior data scientist | Medtronic Inc.   **Jerusalem   2021-2022**

❏ Developed ML-based tools to optimize anesthesia levels for elderly and high-risk patients.

❏ Led the strategic transition from rule-based clinical decision systems to predictive ML models.

❏ Provided expert scientific support and data analysis for large-scale clinical studies.

Algorithms and R&D | Real Imaging Ltd.   Airport City 2015-2017

❏ Developed 3D IR imaging technology for non-invasive breast cancer detection.

❏ Re-engineered imaging hardware to achieve high-precision thermal sensitivity (<0.1°C).

❏ Modeled and corrected IR optical distortions through 3D simulation and sensor characterization.

❏ IR camera sensors characterization.

Postdoctoral research fellow

Harvard University, Physics and the FAS Center for Systems Biology   **2010–2015**
"Systemic response of *C. elegans* to Pathogens and Stress"

❏ Research and experimental design.

❏ Designed an automated experimental setup integrating time-series fluorescence imaging and microfluidics (lab-on-chip).

❏ Built a comprehensive data pipeline for image processing and automated signal analysis.

Postdoctoral research fellow
Brandeis University, Department of Biology   **2009-2010**
"Generation of integrative behavior within an individual neural circuit in *C. elegans"*

Applied optics researcher
Applied Materials Inc. Yavne, Israel   **1997-1999**
❏ Developed opto-acoustic devices for high-precision wafer inspection.

Education

Ph.D.   **2002-2007**

The Weizmann Institute of Science, Israel

Faculty: Physics, department of materials and interfaces

Thesis: "Simple Thermodynamics underlie Nucleo-Cytoplasmic Transport"

Ms.C.   **1999-2001**

The Hebrew University of Jerusalem, Israel

Faculty: Physics, department of condensed matter

Thesis: "Correlated Hopping in the Infinite-Dimensional Hubbard Model"

Bs.C.   **1994-1998**

The Hebrew University of Jerusalem, Israel

Faculty: Physics and Mathematics

Honors and Awards

EMBO postdoctoral fellowship   **2009-2011**

Dan Holtzman Prize for an excellent Ph.D. Thesis   **2008**

The Lev Margulis prize - the Israeli society for Microscopy (ISM)   **2007**

Selected Publications

Haruvi A, Kopito RB, Brande-Eilat N, Kalev S, Kay E, Furman D. Measuring and Modeling the Effect of Audio on Human Focus in Everyday Environments Using Brain-Computer Interface Technology. Front Comput Neurosci. 2022 Jan 27;15:760561

Lee KS, Iwanir S, Kopito RB, Scholz M, Calarco JA, Biron D, Levine E. Serotonin-dependent kinetics of feeding bursts underlie a graded response to food

availability in C. elegans. Nature Communications. 2017 Feb 1;8:14221

Kopito RB, Levine E. Durable spatiotemporal surveillance of Caenorhabditis elegans response to environmental cues, Lab on a chip. 2014 14(4):764-70

Cohen AA, Kalisky T, Mayo A, Geva-Zatorsky N, Danon T, Issaeva I, Kopito RB, Perzov N, Milo R, Sigal A, Alon U. Protein dynamics in individual human cells: experiment and theory, PLoS ONE. 2009 4(4) e4901

Kopito RB, Elbaum M. Nucleocytoplasmic transport: a thermodynamic mechanism, Human Frontiers Science program Journal. 2009 3(2): 67-151

Kopito RB, Elbaum M. Reversibility in nucleocytoplasmic transport, *Proc. Natl. Acad. Sci. USA.* 2007, 104 (31):12743-8. Highlighted in Faculty of 1000

BioRxiv
Kopito RB, Aia Haruvi, Noa Brande-Eilat, Shai Kalev, Eitan Kay, Dan Furman. Brain-based Authentication: Towards A Scalable, Commercial Grade Solution Using Noninvasive Brain Signals bioRxiv 2021.04.09.439244 (2021)

Kopito RB, Kathie Watkins, Erel Levine. Systemic activation coordinates the heat shock response of the insulin/IGF-1 pathway in *C.elegans*. bioRxiv 131375 (2017)