

Hila Naaman

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Education

2019-2024: **Ph.D, School of Mathematics and Computer Science, Weizmann Institute of Science.**

Under the supervision of Prof. Yonina Eldar.

Research interests: The intersection of machine learning and signal processing.

Research title: "Signal Processing for Brain-Inspired Computing".

2016-2019: **B.Sc. in Electrical & Electronic Engineering, Shenkar College.**

2014-2017: **M.Sc., Physics, Bar-Ilan University.**

Under the supervision of Prof. Yuval Garini.

Research interests: Developing algorithms and statistical methods to study single-molecule protein folding.

Research title: "Adenylate kinase protein folding studied on the single-molecule level".

2010-2013: **B.Sc. in Mathematics and Physics, Bar-Ilan University.**

Started the studies during high school in the framework of "the advancing youth gifted in mathematics" program.

Completed my bachelor's degree at age 19.

Academic projects

2018-2019: **School of Mathematics and Computer Science, Weizmann Institute of Science.**

Research Assistant Under the supervision of Prof. Tamar Flash.

Research interests: Combining algorithmic approaches, such as the FADA algorithm, with statistical analysis methods that I have developed to model movements.

Research title: "Modeling upper limb movements".

2013: **Project Intern at Prof. Ido Bachelet's Lab at DNA Origami Field, Bar-Ilan University.**

Work Experience

From 2021-2024: **Teaching assistant – School of Mathematics and Computer Science, Weizmann Institute of Science.**

Course name: Introduction to Signal Sampling and Processing.

Syllabus: <https://erez.weizmann.ac.il/apx/f?p=186:30:::NO::pid,pprev:14491,14170>

From 2014: **Teaching assistant, and a lecturer - MTA - The Academic College of Tel Aviv-Yaffo.**

Lecturer and TA in the courses: Introduction to Logic and Set Theory, Discrete Mathematics, Calculus 1.

2015-2017: **Integration engineer, Al Cielo Inertial Solutions designed.**

Work interests: Integration engineer position, student position I developed a MATLAB simulation and validated lab results, demonstrating my proficiency in software development and data analysis within the context of reference, control, stabilization, and navigation solutions for defense air applications.

2013-2015: **Teaching assistant, Bar-Ilan University.**

Courses: Optics, Classical Physics B, Physics Laboratory, Introduction to Computational Physics.

2012-2013: Sherut Leumi at the Netanya Foundation.

Skills

Computer: Extensive knowledge and experience in simulations using MATLAB and Python.

Knowledge and experience in C, C#, C++, Labview, and Latex.

Languages: Hebrew (native), English (fluent).

Scholarships and Awards

2019 – 2021: The Israeli Council for Higher Education (CHE) via the Weizmann Data Science Research Center – Ph.D. Scholarship in Data Science.

2018 – 2019: School of Mathematics and Computer Science, Weizmann Institute of Science – Ph.D. scholarship.

2017 – 2018: - Pernick Foundation – scholarship for outstanding students.

2015 – 2017: Netanya Mayor's awards.

2014 – 2017: Physics department, Bar Ilan University – Master scholarship.

Publications (Journal - [J], Conference [C])

Accepted:

- [J1] **H Naaman**, S Mulleti, YC Eldar
“FRI-TEM: Time encoding sampling of finite-rate-of-innovation signals“
IEEE Transactions on Signal Processing 70, 267-2279 (2022).
- [J2] A Barliya, N Krausz, **H Naaman**, E Chiovetto, M Giese, T Flash
“Human Arm Redundancy - A New Approach for the Inverse Kinematics Problem”
Royal Society Open Science 11, 231036 (2024)
- [C1] **H Naaman**, S Savariego, N Glazer, M Namer, YC Eldar
“Sub-Nyquist Time-Based Hardware for Heart Rate Monitoring of ECG Signals“
IEEE international Conference on Acoustics, Speech and Signal Processing (ICASSP) (2023)
- [C2] T Sharon **H Naaman**, Y Eder, YC Eldar
“Deep Learning MIDL Real-Time Quantitative Ultrasound and Radar Knowledge-Based Medical Imaging “
Medical Imaging with Deep Learning (MIDL) (2023)
- [C3] T Sharon **H Naaman**, Y Eder, YC Eldar
“Real-Time Quantitative Ultrasound and Radar Medical Imaging“ (IUS)(2023)
- [C4] T Sharon **H Naaman**, Y Eder, YC Eldar
“Real-Time Quantitative Radar and Ultrasound Medical Imaging“
(COMCAS) (2023)
- [C5] **H Naaman**, D Bilik, Y Eder, YC Eldar
“Efficient ECG reconstruction and Heart Rate Monitoring using time-based sampler” (COMCAS) (2023)
- [C6] S Tarnopolsky, **H Naaman**, YC Eldar, A Cohen
“Compressed IF-TEM: Time Encoding Analog-To-Digital Compression”
arXiv preprint arXiv:2210.17544 (2022)
- [C7] **H Naaman**, S Mulleti, YC Eldar
“Uniqueness and Robustness of TEM-Based FRI Sampling“
IEEE International Symposium on Information Theory (ISIT), 2631-2636 (2022).
- [C8] **H Naaman**, A Cohen, S Mulleti, YC Eldar
“Time-Based Quantization for FRI and Bandlimited signals“
IEEE European Signal Processing Conference (EUSIPCO) (2022).
- [C9] **H Naaman**, H Zhang, S Mulleti, YC Eldar
“Learned ISTA for Time Encoding FRI Signals“
Israel Data Science Initiative (IDSI)(2022).
- [C10] **H Naaman**, E Reznitskiy, N Glazer, M Namer, YC Eldar
“Sub-Nyquist time-based sampling of FRI signals“
IEEE international Conference on Acoustics, Speech and Signal Processing (ICASSP) (2021).

Submitted:

- [J3]** **H Naaman**, N Glazer, M Namer, D Bilik, S Savariego, YC Eldar
“Hardware Prototype of a Time-Encoding Sub-Nyquist ADC”
arXiv preprint arXiv:2301.02012 (2023) (submitted to IEEE Transactions on Instrumentation & Measurement)
- [J4]** **H Naaman**, D Bilik, S Savariego, M Namer, YC Eldar
“ECG-TEM: Time-based sub-Nyquist sampling for ECG signal”
arXiv preprint arXiv:2405.13904 (2024) (submitted to IEEE Transactions on Signal Processing)
- [J5]** **H Naaman**, D Bilik, S Savariego, M Namer, YC Eldar
“Time Encoding Quantization of Bandlimited and Finite-Rate-of-Innovation Signals”
arXiv preprint arXiv:2110.01928 (2024) (submitted to IEEE Transactions on Signal Processing)