

RESUME

August 2026

1. PERSONAL DETAILS

Eyal Baruch

Date and place of birth: 1990

Israel Marital status: Married

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ORCID ID: 0000-0002-5319-4342

2. ACADEMIC DEGREES

2021-2024: PhD in Mechanical Engineering, Technion - IIT.

Thesis: Model-based topography identification using Autoresonance control.

Advisor: Prof. Izhak Bucher.

2018-2020: MSc in Mechanical Engineering at the Technion. (Summa cum laude)

Thesis: Fault detection and wave control of imperfect cyclic symmetric systems.

Advisor: Prof. Izhak Bucher.

2014-2018: Bsc in Mechanical Engineering at Tel-Aviv University.

3. ACADEMIC APPOINTMENTS

2026-present: Assistant Professor, Faculty of Mechanical Engineering, Technion, Israel

2024-2026: Postdoctoral researcher at California Institute of Technology (Caltech), in the Space Structures Laboratory, under the Space Solar Power Project.

Principal Investigator: Prof. Sergio Pellegrino.

4. RESEARCH INTERESTS

My research interests focus on the intersection of structural dynamics, nonlinear dynamics, and additive manufacturing, with a specific aim of designing and fabricating **smart, lightweight, active space structures**. I am particularly interested in leveraging additive manufacturing to create novel architectures that integrate damping and actuation directly into the structural material. My core expertise includes applied control of flexible systems, nonlinear dynamic analysis, and the development of next-generation deployable space systems.

5. PROFESSIONAL EXPERIENCE

2017-2018: Mechanical engineer at Naivelt LTD.

2016-2017: Research assistant at the material fracture laboratory, Tel-Aviv University.

6. TEACHING EXPERIENCE

Teaching assistant

2018-2024: Theory of Vibration, undergraduate.

2018-2024: Microprocessor-based product design, undergraduate.
 2020-2022: Hybrid Dynamics, undergraduate and graduate.
 2023: Kinematics, Dynamics, and Control of robots, undergraduate and graduate.
 2023: Danziger Lab instructor.
 2023: Robotics Lab instructor.

7. AWARDS

2021: Miles Rubin excellence award for research on fault detection and traveling wave excitation in cyclic symmetric systems
 2021-2022: Zeff, Fine and Daniel scholarship of excellence
 2023: Faculty excellence scholarship for a scientific publication
 2023: Mechanical Engineering emeriti excellence scholarship

8. PUBLICATIONS

Thesis

1. Model-based topography identification using Autoresonance control PhD thesis, Technion, Haifa, Israel, September 2024.
2. Fault detection and wave control of imperfect cyclic symmetric systems, M.Sc. thesis, Technion, Haifa, Israel, June 2020.

Published papers

1. **E. Baruch**, Y. Vered, H. Plat, I. Bucher, Active detection of small imperfections in structures with cyclic symmetry. Journal of Vibration and Acoustics. 143(5), 051009.
<https://doi.org/10.1115/1.4049384>
2. Y. Vered, **E. Baruch**, I. Bucher, Experimental Dispersion identification using a fitted state-space model. Journal of Sound and Vibration, 517, 116580.
<https://doi.org/10.1016/j.jsv.2021.116580>
3. **E. Baruch**, Y. Vered, H. Plat, I. Bucher, Automatic traveling wave excitation of structures with imperfect cyclic symmetry. Mechanical Systems and Signal Processing 183, 109616.
<https://doi.org/10.1016/j.ymssp.2022.109616>
4. E. Tenenbaum, **E. Baruch**, A. Dolev, I. Bucher. Laser Doppler Vibrometer measurements of the 3D pressure field for the estimation of the radiation force produced by an acoustic standing-wave levitator. Sensors and Actuators A: Physical 374 (2024): 115505.
<https://doi.org/10.1016/j.sna.2024.115505>
5. **E. Baruch**, I. Bucher. Enhancing tapping-mode atomic force microscopy with AutoResonance control and a hybrid dynamic model. Measurement 242 (2025): 115841.
<https://doi.org/10.1016/j.measurement.2024.115841>
6. **E. Baruch**, I. Bucher, Topography Reconstruction From Nonlinear Distributed Interactions for Nanoscale Metrology Using an Iterative Approximation Method. ASME. *J. Vib. Acoust.* April 2026; 148(2): 020502.
<https://doi.org/10.1115/1.4070532>

7. C. Mallikarachchi, **E. Baruch**, and S. Pellegrino. "Dynamical Analysis of Large Prestressed Foldable Arrays—Natural Frequency Bounds." *Journal of Spacecraft and Rockets* (2026): 1-12.
<https://doi.org/10.2514/1.A36580>

Submitted papers

1. **E. Baruch**, S. Pellegrino, Data Driven Dynamic Scaling of Ultralight Deployable Space structures. Submitted to: Journal of Sound and Vibration.

[Link](#)

Refereed papers in conference proceedings

1. T. Maizel, I. Bucher, **E. Baruch**, Y. Vered, H. Plat, Four-Legged Walking Robot, Steering and Turning Using Phase Control Advances in Service and Industrial Robotics: International Conference on Robotics in Alpe-Adria Danube Region. Cham: Springer International Publishing, 2022.

https://doi.org/10.1007/978-3-031-04870-8_62

2. I. Bucher, **E. Baruch**, Hybrid, Model-Based Tapping Atomic Force Microscope: Microactuators, Microsensors and Micromechanisms. MAMM 2024: 174.

https://doi.org/10.1007/978-3-031-83357-1_18

9. CONFERENCES

1. Active detection of small imperfections in structures with cyclic symmetry, The 8'th Israeli PHM Conference, Herzliya Israel, 12.12.2019.
2. Automatic Traveling Wave Excitation of Structures with Imperfect Cyclic Symmetry, GSC'22, Aerospace Engineering, Technion—IIT, Israel 16.5.2022
3. Nanoscale topography approximation using an autoresonating nanowire. The 30th edition of the biennial ISMA conference on Noise and Vibration Engineering. KU Leuven, 12-14.11.2022
4. Reconstructing nanoscale topography using a controlled vibrating fiber and iterative model inversion, XIX International Symposium on, Dynamic Problems of Mechanics Pirenópolis 26FEB-03 MAR Brazil
5. Experimental Studies of Dynamic Scaling of Deployable Composite Structures. *ASME Aerospace Structures, Structural Dynamics, and Materials Conference*. Houston TX, 5-7.5.2025
6. Statistical Similitude Laws for Ultralight Deployable Space Structures. *ASME Aerospace Structures, Structural Dynamics, and Materials Conference*. Hilton Long Beach, CA, June 8-10, 2026