

# ORR ZOHAR

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## EXPERIENCE

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### PhD Researcher, Stanford University

*Sep 2021 - Present*

**MARVL**; *Evaluating surgical skill from video.*

- Developing methods that leverage weak supervision to generate chain-of-thought reasoning for large multi-modal models that leverage large language models (e.g., Video-LLaVA) for video understanding.
- Developed a vision-based surgical training web application where students can upload videos of themselves practicing, and the application runs a novel multi-task model to evaluate their surgical skills.
- Developed robust object detection models in the open-world setting, where models are expected to detect and incrementally learn unknown objects. Introduced foundation models to open-world object detection.
- Introduced LOVM: Language-Only Vision Model Selection - where one has to predict the performance of foundation VLMs using *only* text - as well as modelGPT, which leverages LLMs for LOVM.
- Developed an objectness-based open-world object detector that can identify unknown objects by estimating the objectness probability of each proposal. The method significantly improved open-world performance.

### PhD Rotations, Stanford University

- **Pyramidal Lab**; *Extracting neural signals from calcium imaging in real-time.*
- **Stanford Computational Imaging Lab**; *Programmable Sensors for Task-Specific Imaging.*

### Zohar Consulting Services

*Mar 2023 - Present*

*President*

- Advising the development of different Machine Learning pipelines, including cell video classification using SIFAR and more traditional detection/segmentation methods.
- Helping to interview Machine Learning Engineer candidates. Providing guidance and advising on grant proposals to secure funding for research and development projects. Helped secure an NIH grant.

### proteanTecs LTD

*Sep 2020 - Jan 2024*

*Machine Learning & Algorithms Engineer*

- Developing supervised/unsupervised machine learning to automate data analytics tasks that help silicon manufacturers improve yield, discover issues with their equipment, and predict failures before they occur.
- Led the development of an algorithmic system that automates data analytics tasks composed of (sequential) parametric estimation, outlier detection, and alert collection and analysis for analytic insights.

### de la Zerda lab, Stanford University

*Jul 2018 - Nov 2018*

*Visiting Undergraduate Researcher*

- Implemented a Synthetic Aperture algorithm and adapted it to our OCT systems for digital refocusing.
- Developed spectral demixing algorithms for GNPs injected in live mice.

## EDUCATION

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### Stanford University

Doctor of Philosophy & Knight-Hennessy Scholar  
Electrical Engineering

*September 2021 - Present*

Master of Science - Computer Science

*September 2022 - Present*

### Technion - Israel Institute of Technology

Master of Engineering  
Electrical & Computer Engineering - Graduated Summa Cum Laude

*March 2019 - March 2021*  
(GPA: 98.4/100)

Bachelor of Science  
Chemical Engineering - Graduated Summa Cum Laude

*October 2015 - October 2019*  
(GPA: 97.5/100)

## SELECTED PUBLICATIONS

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- **Zohar, O.**, Wang, X., Bitton, Y., Szpektor, I. Yeung, S., (2024). Video-STaR: Bootstrapping Weak Video Supervision for Visual Instruction Tuning. *Submitted to ECCV 2024*.
- Wang\*, X., Zhang\*, Y., **Zohar, O.**, Yeung, S., (2024). VideoAgent: Long-form Video Understanding with Large Language Model as Agent. *arXiv preprint, Submitted to ECCV 2024*. arXiv:2403.10517
- **Zohar, O.**, Lozano, A. Goel, S., Yeung, S., Wang, K., (2024). Open World Object Detection in the Era of Foundation Models. *arXiv preprint, Submitted to ECCV 2024*. arXiv:2312.05745
- **Zohar, O.**, Huang, M., Wang, K., Yeung, S., (2023). LOVM: Language-Only Vision Model Selection. *NeurIPS (D&B) 2023*.
- **Zohar, O.**, Wang, K., Yeung, S., (2023). PROB: Probabilistic Objectness for Open World Object Detection. *CVPR 2023*.
- Goodman, E. D. *et al.*, (2023). Analyzing Surgical Technique in Diverse Open-Surgical Videos with Multi-Task Machine Learning. *JAMA surgery*. doi:10.1001/jamasurg.2023.6262.
- **Zohar\***, **O.**, Khatib\*, M. *et al.*, (2021). Bio-Interfaced Sensors for Biodiagnostics. *VIEW*.
- Khatib, M., **Zohar, O.** *et al.*, (2020). A Multifunctional Electronic Skin Empowered with Damage Mapping and Autonomic Acceleration of Self-Healing in Designated Locations. *Adv. Mater.* (+Frontispiece).
- Zhao, J., Winetraub, *et al.*, (2020). Angular Compounding for Speckle Reduction in Optical Coherence Tomography using Geometric Image Registration Algorithm and Digital Focusing. *Scientific Reports*.

## AWARDS, GRANTS & PATENTS

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100K Google-HAI research grant	2024-25
200K HAI-AIMI research grant	2023-25
Knight-Hennessy Scholar	2021-24
Intuitive Surgical Best Poster at the SCIEN Industry Affiliates Meeting	Spring 2021
Patent: "A multifunctional and water-resistant electronic skin empowered with an autonomic self-repair mechanism."	Summer 2021
The Norman and Barbara Seiden family prize	Spring 2018
Technion president's award (7x, top 3% GPA) & Technion dean's award (1x, top 15% GPA).	2015-19

## ADDITIONAL EXPERIENCE

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**LNBD, Technion - Israel Institute of Technology** Nov 2018 - Mar 2021  
*Junior Researcher - Soft Electronics*

Helped develop state-of-the-art self-healing multifunctional-multilayer electronic skins and sensors.

**QUAD Lab, Technion - Israel Institute of Technology** May 2017 - Oct 2019  
*Student Research Projects (A & B)*

- Developed high-TC Superconducting Nanowire Single-Photon Detectors. Initiated the Selective Growth method currently in use for producing YBCO SNSPDs.
- Physical, electrical, and thermal modeling of superconductor-semiconductor tunnel junctions.

## OTHER SKILLS

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<b>Programming Languages</b>	Python, Julia, C
<b>Software &amp; Tools</b>	Working with remote Linux/Vertica/S3/GPC servers, GitHub
<b>Other</b>	LaTeX, MS Office

## CONFERENCES & VOLUNTEERING

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- Presented a poster at the SCIEN Industry Affiliates Conference, Stanford. 2021
- Developed COVID19 early screening technology using ML and electronic stethoscopes. 2020