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Eli Schwartz – Curriculum Vitae

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Education

2019-present **Ph.D. Electrical Engineering, Tel Aviv University, Israel**
- Advisors – Dr. Raja Giryes (TAU) and Prof. Alex Bronstein (CS@Technion)
- Thesis – "Small-Data in the Big-Data Era", Deep Learning with limited data.

2016-2018 **M.Sc. Electrical Engineering, Tel Aviv University, Israel**
- Advisors – Dr. Raja Giryes (TAU) and Prof. Alex Bronstein (CS@Technion)
- Thesis – **"Learning an End-to-End Image Processing Pipeline".** First to show learning of the full camera image processing pipeline in an end-to-end fashion.

2007-2011 **B.Sc. Electrical Engineering, Technion - Israel institute of technology**
- Senior Thesis - Detection of manipulations ("photoshopping") in images. Received the Thomas Schwartz Award for outstanding projects.

Employment

2017-Present **Computer Vision Research – IBM Research AI**
- Conducting and publishing research on deep-learning based few-shot object recognition and detection

2015-2017 **Co-founder & CTO – Inka Robotics**
- A startup developing a vision-based autonomous tattooing robot
- Led the technical team developing algorithms, software & micro-controllers
- Turn it from idea to a working prototype (that tattooed my leg)

2013-2016 **Computer Vision Algorithm Developer – Microsoft**
- Worked on the HoloLens Project (augmented reality smart glasses)
- Part of an incubation team – fast development of PoC for innovative technologies
- Developed computer vision algorithms for 3D cameras and Gaze tracking

2011-2013 **ASIC Engineer – Qualcomm**
Formal verification technical lead; Functional verification

2008-2011 **ASIC Engineering Intern – IBM**
ASIC formal and functional verification

2002-2005 **Military Service** - Combat military service in the Armored Corps, IDF

Teaching

2018 TA - Deep Learning Course (CS@Technion)

2017-Present Supervising undergrad students' final projects (EE@Tel-Aviv University)

Awards

- IBM Research Accomplishment Award, 2020
- IBM PhD Fellowship Award, 2020
- IBM Invention Plateau Award (for prolific inventors), 2020
- IMVC Best Student Paper, 2019
- Thomas Schwartz Award for outstanding projects (Senior Thesis), 2011

Languages Hebrew – Mother tongue; English – fluent
Programing languages/Frameworks TensorFlow/Pytorch, OpenCV, Python, C++

Community Service

- Program Chair - Learning with Limited Labels Workshop, CVPR 2020
- Reviewer - IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI); Conference on Computer Vision and Pattern Recognition (CVPR); Computer Vision and Image Understanding (CVIU); International Conference on Learning Representations (ICLR)

Publications

Peer-reviewed papers

G. Bukchin, **E. Schwartz**, K. Saenko, O. Shahar, R. Feris, R. Giryes*, L. Karlinsky* "*Fine-grained Angular Contrastive Learning with Coarse Labels*", CVPR 2021 (Oral, 3.5% acceptance rate) pdf

L. Karlinsky*, J. Shtok*, A. Alfassy*, M. Lichtenstein*, S. Harary, **E. Schwartz**, S. Doveh, P. Sattigeri, R. Feris, A. Bronstein, R. Giryes, "*StarNet: towards weakly supervised few-shot detection and explainable few-shot classification*", AAAI 2021 pdf

C. Baskin*, **E. Schwartz***, E. Zheltonozhskii, N. Liss, R. Giryes, A. M. Bronstein and A. Mendelson, "*UNIQ: Uniform Noise Injection for the Quantization of Neural Networks*", ACM Transactions on Computer Systems, 2020 pdf

S. Doveh*, **E. Schwartz***, C. Xue, R. Feris, A. Bronstein, R. Giryes, L. Karlinsky "*MetAdapt: Meta-Learned Task-Adaptive Architecture for Few-Shot Classification*", CVPR 2020 (Workshop) pdf

E. Schwartz*, L. Karlinsky*, R. Feris, R. Giryes and A. Bronstein, *"Baby steps towards few-shot learning with multiple semantics*", CVPR 2020 (Workshop) pdf

N. Diamant*, D. Zadok*, C. Baskin, **E. Schwartz** and A. M. Bronstein, "*Beholder-GAN: Generation and Beautification of Facial Images with Conditioning on Their Beauty Level*", ICIP 2019 pdf

L. Karlinsky*, J. Shtok*, S. Harary*, **E. Schwartz***, M. Marder, S. Pankanti, R. Feris, A. Kumar, R. Giryes and A. Bronstein, "*RepMet: Representative-based metric learning for classification and one-shot object detection*", CVPR 2019 pdf

E. Schwartz*, L. Karlinsky*, J. Shtok, S. Harary, M. Marder, R. Feris, A. Kumar, R. Giryes and A. Bronstein, "*Delta-encoder: an effective sample synthesis method for few-shot object recognition*", NeurIPS 2018 (Spotlight, 3% acceptance rate) pdf

E. Schwartz, R. Giryes and A. M. Bronstein, "*DeepISP: Learning End-to-End Image Processing Pipeline*", IEEE Transactions on Image Processing, 2018 pdf

Preprints

E. Schwartz, R. Giryes and A. M. Bronstein, "*ISP Distillation*", 2021 pdf

C. Baskin, N. Liss, Y. Chai, E. Zheltonozhskii, **E. Schwartz**, R. Giryes, A. Mendelson and A. M. Bronstein, "*NICE: Noise Injection and Clamping Estimation for Neural Network Quantization*", 2018 pdf

Patents

E. Schwartz, L. Karlinsky, S. Doveh, "*Task-Adaptive Architecture for Few-Shot Classification.*" US patent application No. 17/106114.

O. K. Fabian, G. Adler, L. Y. Chertkow, E. Schwartz, R. Danon, J. Nes-El, "*Automated Tattooing System and Method*." WO/2020/178818

*Equal contributors

L. Karlinsky, J. Shtok, E. Schwartz, "*TAFSSL: Task Adaptive Feature Sub-Space Learning for few-shot learning.*" US patent application No. 17/000,319.

L. Karlinsky, E. Schwartz, J. Shtok, M. Marder and S. Harary, "*Representative-Based Metric Learning for Classification and Few-Shot Object Detection*." US patent application No. 16/240,927.

L. Karlinsky, M. Marder, E. Schwartz, J. Shtok and S. Harary, "*Out-of-sample generating few-shot classification networks*." US patent application No. 16/206,528.

C. Baskin, E. Schwartz, E. Zheltonozhskii, N. Liss, R. Giryes, A. M. Bronstein and A. Mendelson, "*System and method for emulating quantization noise for a neural network.*" US provisional patent application No. 62/661,016.

E. Schwartz, R. Giryes and A. M. Bronstein, "*Method and system for end-to-end image processing*." U.S. Patent Application No. 16/251,123.

E. Shalev, S. Katz, and E. Schwartz. "*Imaging devices and methods for authenticating a user*." U.S. Patent Application No. 14/995,025.

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