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| **Eli Schwartz – Curriculum Vitae** | | | | | | |
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| [me@eli-schwartz.com](mailto:Eli.shw@gmail.com) | | |  | | [+972-505-790959](tel:+972505790959) | |
|  | | |  |  | |  |
| **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](https://arxiv.org/abs/2012.03515)

[L. Karlinsky](https://arxiv.org/search/cs?searchtype=author&query=Karlinsky%2C+L)\*, [J. Shtok](https://arxiv.org/search/cs?searchtype=author&query=Shtok%2C+J)\*, [A. Alfassy](https://arxiv.org/search/cs?searchtype=author&query=Alfassy%2C+A)\*, [M. Lichtenstein](https://arxiv.org/search/cs?searchtype=author&query=Lichtenstein%2C+M)\*, [S. Harary](https://arxiv.org/search/cs?searchtype=author&query=Harary%2C+S), **[E. Schwartz](https://arxiv.org/search/cs?searchtype=author&query=Schwartz%2C+E)**, [S. Doveh](https://arxiv.org/search/cs?searchtype=author&query=Doveh%2C+S), [P. Sattigeri](https://arxiv.org/search/cs?searchtype=author&query=Sattigeri%2C+P), [R. Feris](https://arxiv.org/search/cs?searchtype=author&query=Feris%2C+R), [A. Bronstein](https://arxiv.org/search/cs?searchtype=author&query=Bronstein%2C+A), [R. Giryes](https://arxiv.org/search/cs?searchtype=author&query=Giryes%2C+R), “*StarNet: towards weakly supervised few-shot detection and explainable few-shot classification*”, AAAI 2021 [pdf](https://arxiv.org/abs/2003.06798)

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](https://arxiv.org/abs/1804.10969)

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](https://arxiv.org/abs/1912.00412)

[**E. Schwartz**](https://arxiv.org/search?searchtype=author&query=Schwartz%2C+E)**\***, [L. Karlinsky](https://arxiv.org/search?searchtype=author&query=Karlinsky%2C+L)\*, [R. Feris](https://arxiv.org/search?searchtype=author&query=Feris%2C+R), [R. Giryes](https://arxiv.org/search?searchtype=author&query=Giryes%2C+R) and [A. Bronstein](https://arxiv.org/search?searchtype=author&query=Bronstein%2C+A+M), *“Baby steps towards few-shot learning with multiple semantics*”, CVPR 2020 (Workshop) [pdf](https://arxiv.org/pdf/1906.01905)

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](https://arxiv.org/abs/1902.02593)

[L. Karlinsky](https://arxiv.org/search?searchtype=author&query=Karlinsky%2C+L)\*, [J. Shtok](https://arxiv.org/search?searchtype=author&query=Shtok%2C+J)\*, [S. Harary](https://arxiv.org/search?searchtype=author&query=Harary%2C+S)\*, **[E. Schwartz](https://arxiv.org/search?searchtype=author&query=Schwartz%2C+E)\***, [M. Marder](https://arxiv.org/search?searchtype=author&query=Marder%2C+M), [S. Pankanti](https://arxiv.org/search?searchtype=author&query=Pankanti%2C+S), [R. Feris](https://arxiv.org/search?searchtype=author&query=Feris%2C+R), [A. Kumar](https://arxiv.org/search?searchtype=author&query=Kumar%2C+A), [R. Giryes](https://arxiv.org/search?searchtype=author&query=Giryes%2C+R) and [A. Bronstein](https://arxiv.org/search?searchtype=author&query=Bronstein%2C+A+M), “*RepMet: Representative-based metric learning for classification and one-shot object detection*”, CVPR 2019 [pdf](https://arxiv.org/abs/1806.04728)

[**E. Schwartz**](https://arxiv.org/search?searchtype=author&query=Schwartz%2C+E)**\***, [L. Karlinsky](https://arxiv.org/search?searchtype=author&query=Karlinsky%2C+L)\*, [J. Shtok](https://arxiv.org/search?searchtype=author&query=Shtok%2C+J), [S. Harary](https://arxiv.org/search?searchtype=author&query=Harary%2C+S), [M. Marder](https://arxiv.org/search?searchtype=author&query=Marder%2C+M), [R. Feris](https://arxiv.org/search?searchtype=author&query=Feris%2C+R), [A. Kumar](https://arxiv.org/search?searchtype=author&query=Kumar%2C+A), [R. Giryes](https://arxiv.org/search?searchtype=author&query=Giryes%2C+R) and [A. Bronstein](https://arxiv.org/search?searchtype=author&query=Bronstein%2C+A+M), “*Delta-encoder: an effective sample synthesis method for few-shot object recognition*”, NeurIPS 2018 (Spotlight, 3% acceptance rate) [pdf](https://arxiv.org/abs/1806.04734)

**E. Schwartz**, R. Giryes and A. M. Bronstein, “*DeepISP: Learning End-to-End Image Processing Pipeline*”, IEEE Transactions on Image Processing, 2018 [pdf](https://arxiv.org/abs/1801.06724)

## Preprints

**E. Schwartz**, R. Giryes and A. M. Bronstein, “*ISP Distillation*”, 2021 [pdf](https://arxiv.org/abs/2101.10203)

[C. Baskin](https://arxiv.org/search/cs?searchtype=author&query=Baskin%2C+C), [N. Liss](https://arxiv.org/search/cs?searchtype=author&query=Liss%2C+N), [Y. Chai](https://arxiv.org/search/cs?searchtype=author&query=Chai%2C+Y), [E. Zheltonozhskii](https://arxiv.org/search/cs?searchtype=author&query=Zheltonozhskii%2C+E), **[E. Schwartz](https://arxiv.org/search/cs?searchtype=author&query=Schwartz%2C+E)**, [R. Giryes](https://arxiv.org/search/cs?searchtype=author&query=Giryes%2C+R), [A. Mendelson](https://arxiv.org/search/cs?searchtype=author&query=Mendelson%2C+A) and [A. M. Bronstein](https://arxiv.org/search/cs?searchtype=author&query=Bronstein%2C+A+M), “*NICE: Noise Injection and Clamping Estimation for Neural Network Quantization*”, 2018 [pdf](https://arxiv.org/abs/1810.00162)

# 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

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.