Sagie Benaim

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EDUCATION

University of Copenhagen, Copenhagen, Denmark **November 2021 - Now**

Postdoctoal Associate (Computer Vision, Deep Learning)

- Research with Prof. Serge Belongie in the areas of Computer Vision for Augmented Reality, Generative Models, 3D Models, Content Creation, Semi-Supervised and Self-Supervised learning.

Tel Aviv University, Tel Aviv, Israel **April 2017 - October 2021**

PhD in Computer Science (Computer Vision, Deep Learning)

- Research with Prof. Lior Wolf in the areas of Unsupervised Learning, Self-supervised Learning, Generative Models, Domain Adaptation and Disentanglement.
- Awarded The Raymond and Beverly Sackler Excellence Scholarship for the Faculty of Exact Sciences (January 2018).

University of Oxford, Oxford, UK **September 2011 - September 2012**

MSc Mathematics and the Foundations of Computer Science (Distinction)

- Thesis: 'Verification of Two Variable First Order Logic and related Logics on trees'. Research with Prof Michael Benedikt in the areas of Algorithms, Formal verification, Logic, Complexity.

Imperial College London, London, UK **September 2008 - June 2011**

BSc Mathematics and Computer Science (1st Class Honours)
Awards/Bursaries

- Computing Entrance Award - Academic Excellence (October 2008).
- Gloucester Research Award - Academic Excellence (awarded top 10 students across all years in department) (October 2009).
- Nuffield Undergraduate Research Bursary - Summer research (June 2010).

PUBLICATIONS

Polynomial Neural Fields for Subband Decomposition. G. Yang*, S. Benaim*, V. Jampani, K. Genova, J. T. Barron, T. Funkhouser, B. Hariharan, S. Belongie. In Neural Information Processing Systems (NeurIPS), 2022. *Equal Contribution.

H. Chefer, S. Benaim, R. Paiss, L. Wolf. Image-Based CLIP-Guided Essence Transfer. In European Conference of Computer Vision (ECCV), 2022.

R. Mokady, R. Tzaban, S. Benaim, A. Bermano, D. Cohen-or. JOKR: Joint Keypoint Representation for Unsupervised Cross-Domain Motion Retargeting. In Computer Graphics Forum (CGF), 2022.

O. Michel*, R. Bar-On*, R. Liu*, S. Benaim, R. Hanocka. Text2Mesh: Text-Driven Neural Stylization for Meshes. In IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022. *Equal Contribution. **Accepted as an oral presentation**.

L. Ben Moshe, S. Benaim, L. Wolf. FewGAN: Generating from the Joint Distribution of a Few Images. In International Conference on Image Processing (ICIP), 2022.

S. Sheynin*, S. Benaim*, L. Wolf. A Hierarchical Transformation-Discriminating Generative Model for Few Shot Anomaly Detection. In IEEE International Conference on Computer Vision (ICCV), 2021. *Equal Contribution.

N. Gat, S. Benaim. L. Wolf. Identity and Attribute Preserving Thumbnail Upscaling. 2021. In International Conference on Image Processing (ICIP), 2021.

T. Galanti, S. Benaim, L. Wolf. Risk Bounds for Unsupervised Cross-Domain Mapping with IPMs. In Journal of Machine Learning Research (JMLR), 2021.

O. Nuriel, S. Benaim, L. Wolf. Permuted AdaIN: Reducing the Bias Towards Global Statistics in Image Classification. In IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2021.

Y. Benny, T. Galanti, S. Benaim, L. Wolf. Evaluation Metrics for Conditional Image Generation. In International Journal of Computer Vision (IJCV), 2020.

S. Benaim*, R. Mokady*, A. Bermano, D. Cohen-Or, Lior Wolf. Structural-analogy from a Single Image Pair. In Computer Graphics Forum (CGF), 2020. *Equal Contribution.

S. Gur*, S. Benaim*, Lior Wolf. Hierarchical Patch VAE-GAN: Generating Diverse Videos from a Single Sample. In Neural Information Processing Systems (NeurIPS), 2020. *Equal Contribution.

S. Benaim, A. Ephrat, O. Lang, T. Dekel, I. Mosseri, W. Freeman, M. Rubinstein, M. Irani. SpeedNet: Learning the Speediness in Videos. In IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2020. **Accepted as an oral presentation**.

R. Mokady, S. Benaim, L. Wolf, A. Bermano. Mask Based Unsupervised Content Transfer. In International Conference on Learning Representations (ICLR), 2020.

S. Benaim, M. Khaitov, T. Galanti, L. Wolf. Domain Intersection and Domain Difference. In IEEE International Conference on Computer Vision (ICCV), 2019.

M. Michaelsvhvilli, S. Benaim, L. Wolf. Semi-Supervised Monaural Singing Voice Separation With A Masking Network Trained On Synthetic Mixtures. In International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2019.

O. Press, T. Galanti, S. Benaim, L. Wolf. Emerging Disentanglement in Auto-Encoder Based Unsupervised Image Content Transfer. In International Conference on Learning Representations (ICLR), 2019.

L. Wolf, S. Benaim, T. Galanti. Unsupervised Learning of the Set of Local Maxima. In International Conference on Learning Representations (ICLR), 2019.

S. Benaim, L. Wolf. One-Shot Unsupervised Cross Domain Translation. In Neural Information Processing Systems Conference (NeurIPS), 2018.

S. Benaim*, T. Galanti*, L. Wolf. Estimating the Success of Unsupervised Image to Image Translation. In European Conference of Computer Vision (ECCV), 2018. *Equal Contribution.

T. Galanti, L. Wolf, S. Benaim. The Role of Minimal Complexity Functions in Unsupervised Learning of Semantic Mappings. In International Conference on Learning Representations (ICLR), 2018

S. Benaim, L. Wolf. One-Sided Unsupervised Domain Mapping. In Neural Information Processing Systems Conference (NIPS), 2017. **Accepted as a spotlight presentation**.

S.Benaim, M.Benedikt, W.Charatonik, E.Kieronski, R.Lenhardt, F.Mazowiecki and J.Worell. Complexity of Two-Variable Logic on Finite Trees. In International Colloquium on Automata, Languages and Programming (ICALP), 2013.
- Also accepted to ACM Transactions on Computational Logic Journal, Volume 17, 2016

Workshops

S. Loeschcke, S. Belongie, S. Benaim. Text-Driven Stylization of Video Objects. In Workshop on AI for Creative Video Editing and Understanding (ECCV), 2022

S. Benaim*, R. Mokady*, A. Bermano, D. Cohen-Or, Lior Wolf. Structural-analogy from a Single Image Pair. In Deep Internal Learning Workshop (ECCV), 2020. *Equal Contribution.

S. Gur*, S. Benaim*, Lior Wolf. Hierarchical Patch VAE-GAN: Generating Diverse Videos from a Single Sample. In Deep Internal Learning Workshop (ECCV), 2020. *Equal Contribution.

T. Galanti, S. Benaim, L. Wolf. Risk Bounds for Unsupervised Cross-Domain Mapping with IPMs. In Integration of Deep Learning Theories workshop, (NeurIPS), 2018.

Preprints

Assessing Neural Network Robustness via Adversarial Pivotal Tuning of Real Images. P. E. Christensen, V. Snaebjarnarson, A. Dittadi, S. Belongie, S. Benaim. In Submission.

S. Benaim, F. Warburg, P. E. Christensen, S. Belongie. Volumetric Disentanglement for 3D Scene Manipulation. In Submission.

S. Sheynin, S. Benaim, A. Polyak, L. Wolf. Locally Shifted Attention With Early Global Integration. In Submission.

Teaching

Tel Aviv University, Israel **February 2021 - July 2021**
Course lecturer for the course 'Convolutional Neural Networks'.

Tel Aviv University, Israel **February 2020 - July 2020**
Course lecturer for the course 'Convolutional Neural Networks'.

Tel Aviv University, Israel **February 2019 - July 2019**
Course lecturer for the course 'Convolutional Neural Networks'.

Employment

Google Research, Israel **June 2019 - September 2019**
Supervisors: Prof. William T. Freeman, Prof. Michal Irani, Prof. Tali Dekel.
Research Intern, Perception Team.
- *Role:* Research in self supervised learning of videos.

Israel Defense Forces, Israel **October 2013 - October 2016**
Software Engineer, Intelligence Unit.
- *Role:* Research and development in the flagship project of the department.

- Programming in Embedded Settings in C and Python, Network programming (TCP/IP), Unix programming. Good understanding of OS, Networking and Security Concepts.

Imperial College London, London, UK **June 2010 - September 2010**
Supervisors: Prof. David Ham, Dr Jon Hill
Applied Modeling and Computation Group.
- *Role:* Improve Imperial College Ocean Model (ICOM).

Imperial College London, London, UK **June 2009 - September 2009**
Supervisors: Prof. David Colling, Dr Janusz Martiniak
High Energy Physics Group.
- *Role:* Integration of Imperial's GridPP and Nordugrid information systems (two distributed grid systems used for particle physics.)

Skills

Computing Skills
Programming and Scripting Languages:
- Proficient: Python, Unix, Network Programming, Assembly (x86 and others), LaTeX. DL Platforms: PyTorch, Tensorflow.
- Working knowledge of Java, C, C++, Prolog, Matlab, Haskell

Operating Systems: Linux, Windows.
Others: Computer Vision, Deep Learning, Machine Learning, LaTeX, OpenCV, Image Processing, Databases (PostgreSQL and MySQL), Network programming (TCP/IP), Unix programming, OS, Networking and Security Concepts and Tools.

Languages: English, Hebrew (Native), French (Basic)

Invited Talks

Text2Mesh: Text-Driven Stylization for Meshes, Israel Computer Vision Day 2021, Pre-CVPR Day, University of Copenhagen 2022.

Semantic Manipulation of Visual Content, Pioneer Center of AI Colloquium, hosted by Aarhus University and Technion CDS Seminar, 2021.

Structure-Aware Manipulation of Images and Videos. Google Research (Israel), 2021; Nvidia Research (US), 2021; Stanford Vision and Learning Lab Seminar, 2021; Visual Computing Seminar (Tel Aviv University), 2021; Facebook AI Research (London), 2021.

Manipulating Structure in Images and Videos. Technion Computational Data Science Seminar, 2021; Berkeley Vision Seminar, 2021; Nvidia Research (Israel), 2021.

On Disentangled and Few Shot Visual Generation and Understanding. Google Viscam Seminar, 2020.

Learning the Speediness in Videos and Generating Novel Videos From a Single Sample. Hebrew University Computer Vision Seminar, 2020; Technion Machine Learning Seminar, 2020.

SpeedNet: Learning the Speediness in Videos. Viz.ai, 2020.

Visual Analogies: The role of disentanglement and learning from few example, Hebrew University Vision Seminar, 2020.

Domain Intersection and Domain Difference. Amazon, 2020; ICCVi, 2019.

Generative Adversarial Networks for Image to Image Translation. Israel Machine Vision Conference, 2019.

New Capabilities in Unsupervised Image to Image Translation. Bar Ilan University Machine Learning Seminar, 2019.

One-Shot Unsupervised Cross Domain Translation. Technion Computational Data Science Seminar, 2019.

Introduction to Generative Adversarial Networks. Elbit, 2018.

Generative Adversarial Networks for Image to Image Translation. Nexar, 2018.

One-Sided Unsupervised Domain Mapping. Weizmann Institute Vision Seminar, 2018; Hebrew University Vision Seminar, 2018; Technion Computer Vision Colloquium, 2018.

Professional Service

Reviewer for: CVPR, NeurIPS, ICML, ICLR, ECCV, ICCV, AAAI (2018-2022)