

Curriculum Vitae – Michael Rotman

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Summary

Ph.D. student in Computer Science specializing in Deep Learning, holding an M.Sc. in physics, and a B.Sc. magna cum laude in physics and computer science. Holding a position of a Research Scientist at General Electric Research (GRC) AI Laboratory. Looking for a challenging position that will utilize my research abilities and independence.

Education

2015-Current	Ph.D. student in Computer Science, Tel Aviv University Topic: Deep Learning Advisor: Prof. Lior Wolf
2010-2014	M.Sc. in High-Energy Physics, Tel Aviv University Title: Imaginary Sources in Field Theory and String Theory Advisor: Prof. Nissan Itzhaki GPA: 87 Abraham and Dvora Cohen prize for academic achievements, 2012
2007-2010	B.Sc. Magna Cum Laude in Physics and Computer Science, Tel Aviv University GPA Computer Science: 91 GPA Physics: 92

Professional Experience

2015-Current	Research Scientist at General Electric's AI Laboratory Introduced a DNN with spherical kernels that acts on spherical manifolds. Provided an end-to-end solution for the removal of artefacts induced by patients' motions during an MRI scan by constraining k -space at certain stages of a DNN. Designed and implemented a bone-denoising algorithm used SPECT imaging method that allows for shorter scan times. Provided an end-to-end solution for the segmentation and classification of malignant tumors in PETCT scans.
2010-2014	Teaching assistant at Tel Aviv University, Department of Physics 2014 - Mathematical Introduction for Physicists II. 2012-2014 - Advanced Electromagnetism (graduate course). 2012-2014 - Classical Mechanics I.
2004-2007	Military Service Officer in the Medical Corps.

Professional Skills

Programming languages: Python (PyTorch), C, Lua (Torch7)

Hands on experience in Deep Learning:

Computer Vision	Motion correction and Reconstruction of MRI scans. Malignant Tumor Segmentation of PET-CT scans. Deep learning over non-flat manifolds Parameters optimization over various manifolds for better robustness
NLP	Word2vec and GloVe implementation in torch7 Text Segmentation using RNNs Document classification, and data extraction using deep architectures
Anomaly Detection	Detection of anomalous galaxies using Fisher Vectors

Publications

- 2021 | I. Reis, M. Rotman, D. Poznanski, J.X. Prochaska, and L. Wolf. Effectively using unsupervised machine learning in next generation astronomical surveys. *Astronomy and Computing*, 34:100437, 2021
- 2021 | Michael Rotman and Lior Wolf. Shuffling recurrent neural networks. Manuscript Accepted for publication, AAAI Conference on Artificial Intelligence (AAAI)., 2021
- 2021 | Michael Rotman, Rafi Brada, Israel Beniaminy, Sangtae Ahn, Christopher J. Hardy, and Lior Wolf. Correcting motion artifacts in MRI scans using a deep neural network with automatic motion timing detection. In *Medical Imaging 2021: Physics of Medical Imaging*, volume 11595, pages 265 – 274. International Society for Optics and Photonics, SPIE, 2021
- 2020 | M. Rotman and L. Wolf. Electric analog circuit design with hypernetworks and a differential simulator. In *ICASSP 2020 - 2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pages 4157–4161, 2020
- 2019 | Michael Rotman, Itamar Reis, Dovi Poznanski, and Lior Wolf. Detect the unexpected: Novelty detection in large astrophysical surveys using fisher vectors. *11th International Conference on Knowledge Discovery and Information Retrieval*, 2019
- 2019 | Rafi Brada, Michael Rotman, Ron Wein, Sangtae Ahn, Itzik Malkiel, and Christopher J. Hardy. Towards motion-robust mri – autonomous motion timing and correction during mr scanning using multi-coil data and a deep-learning neural network. *International Society for Magnetic Resonance in Medicine 27th Annual Meeting*, 2019
- 2018 | Omri Koshorek, Adir Cohen, Noam Mor, Michael Rotman, and Jonathan Berant. Text segmentation as a supervised learning task. In *Proceedings of the 2018 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, NAACL-HLT, New Orleans, Louisiana, USA, June 1-6, 2018, Volume 2 (Short Papers)*, pages 469–473, 2018

Patents

- 2020 | Mri system and method for detection and correction of patient motion, US Patent 10,806,370, Oct. 2020