

PERSONAL DETAILS

Name: Tamar (Tammy) Riklin Raviv

Office: Room 212, Building 33, Ben-Gurion campus, Beer Sheva, Israel, 08-6428812

Email: rrtammy@ee.bgu.ac.il

URL: <http://www.ee.bgu.ac.il/~rrtammy/>

EDUCATION

1990-1993 B.Sc. The Hebrew University of Jerusalem, Physics (Magna Cum Laude)

1997-1999 M.Sc. The Hebrew University of Jerusalem, Computer Science (Magna Cum Laude)

2002-2008 Ph.D. Tel Aviv University, The School of Electrical Engineering

CURRENT AND PREVIOUS POSITIONS (since PhD)

2012- Senior Lecturer (since 2014) Ben-Gurion University of the Negev
Faculty of Engineering, Electrical and Computer Engineering Department

2008-2012 Research Affiliate/Fellow Harvard Medical School

2010-2012 Research Affiliate/Fellow The Broad Institute of MIT and Harvard

2010-2012 Research Affiliate Massachusetts Institute of Technology (MIT) , CSAIL

2008-2010 Post-Doctorate Associate Massachusetts Institute of Technology (MIT), CSAIL

ORGANIZATION OF SCIENTIFIC MEETINGS AND ADMINISTRATION

| | | |
|-----------|-----------------------------|--|
| 2019-2020 | Associate Editor | IEEE Transactions on Medical Imaging (TMI) Journal |
| 2020-2023 | TC Member | IEEE Bio Imaging and Signal Processing (BISP) Committee |
| 2017-2019 | Associate TC Member | IEEE Bio Imaging and Signal Processing Committee |
| 2015-2020 | Steering committee | Israel Machine Vision Conference (IMVC), Tel-Aviv |
| | Yearly conference | |
| 2020 | Workshops co-chair | Medical Image Computing and Computed Assisted |
| | Program area chair | Intervention (MICCAI) conference, Lima, Peru |
| 2020 | Program area chair | IEEE International Symposium on Biomedical Imaging (ISBI) |
| | Session Chair | Iowa, USA |
| 2019 | Industrial Liaison co-chair | IEEE International Symposium on Biomedical Imaging (ISBI) |
| | Session co-chair | Venice, Italy |
| | Program area chair | |
| 2017 | Special Sessions chair | IEEE International Symposium on Biomedical Imaging (ISBI) |
| | | Melbourne, Australia |
| 2018 | Area Chair | Medical Image Computing and Computed Assisted |
| | | Intervention (MICCAI) conference |
| | | Granada, Spain |
| 2017 | Area Chair | Medical Image Computing and Computed Assisted |
| | | Intervention (MICCAI) |
| | | Quebec city, Quebec, Canada |
| 2016 | Organizer | The Third Interactive Medical Image Computing (IMIC) Workshop |
| | | in conjunction with MICCAI 2016, Athens, Greece |
| 2015 | Organizer | The Second Interactive Medical Image Computing (IMIC) Workshop |
| | | in conjunction with MICCAI 2015, Munich, Germany |
| 2014 | Organizer | The Interactive Medical Image Computing (IMIC) Workshop |
| | | in conjunction with MICCAI 2014, Boston, MA, USA |
| 2013-2016 | Steering committee | Zlotowski Center for Neuroscience, Ben-Gurion University |

Reviewer

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| Since 2008 | Grant proposal reviewer: Israeli Science Foundation (ISF); United States - Israel Binational Science Foundation (BSF); Research Funds of the Ministry of Health; German-Israeli Foundation for Scientific Research and Development (GIF) Ministry of Science and Technology (MOST) |
| Since 2003 | Conference Program Committee Member and reviewer (partial list): CVPR, ICCV, ECCV, ACCV, ICIP, ICPR, MICCAI, ISBI, SSVM |
| Since 2001 | Journal Reviewer (partial list): IEEE TPAMI; IEEE TMI; IEEE T IMAGE PROCES, IEEE T SIGNAL PROCES; IEEE T SYST MAN CYB; MED IMAGE ANAL; CVIU; MACH VISION APPL; SIAM J SCI COMPUT |

HONORS, AWARDS AND FELLOWSHIPS

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| 2017 | BGU, ECE Department teaching excellence for graduate course. |
| 2009 | MICCAI young scientist award |
| 2008 | Yitzhak and Chaya Weinstein award for excellent paper |
| 2007 | Fulbright Post-Doctoral fellowship |
| 2007 | The Commercial and Industrial Club Illan Ramon Post-Doctoral scholar |
| 2007 | The Yitzhak and Chaya Weinstein Award for excellence in studies. |
| 2005 | The Yitzhak and Chaya Weinstein award for excellent paper |
| 1993 | Dean's list, The Hebrew University of Jerusalem |

RESEARCH GRANTS

- 10/2020-9/2023 Principle Investigator with Prof. Galit Lahav of Harvard Medical School
United States - Israel Binational Science Foundation (BSF)
A Deep Learning Framework for Image Analysis of p53 Dynamics in 3D Cultures of Tumor Cells
Total budget for grant period for three years is 240,000 US Dollars (equivalent to 828,192 NIS).
- 5/2020-4/2021 Principle Investigator with Prof. I. Shelef, **Ministry of Science and Technology (MOST)**
Using Deep Learning for Fast Covid-19 Detection and Disease Progress Prediction from Thoracic CT Scans
yearly budget: 288,200 NIS
- 10/2019-9/2023 Principle Investigator, **Israeli Science Foundation (ISF)**
Brain MRI reconstruction and enhancement by generative neural networks
yearly budget: 260,000 NIS (Total budget 1,040,000 NIS)
- 4/2019 **AWS Cloud Credits** for Research program (equivalent to 45,000 \$)
- 10/2017-9/2020 Principle Investigator, **Ministry of Science and Technology (MOST)**
Joint Cell Tracking and Segmentation in High-throughput Time-lapse Microscopy Imaging
Total budget for 36 months: 740,025NIS.
- 3/2017 **Intel Electronics ltd. equipment grant**, 147,160 NIS
- 10/2016-9/2019 Principle Investigator, **Israeli Science Foundation (ISF)**
Co-Segmentation of Brain MRI Ensembles Via Multidimensional Latent Atlases,
yearly budget: 70,680\$ (1\$ = 3.82NIS)
- 8/2016-2/2018 Principle Investigator, **Medical Corps, Israeli Defense Force**
Mild Traumatic Brain Injuries (mTBI) Assessment using Diffusion Tensor Imaging (DTI) Asymmetry
with Co-PIs Ilan Shelef (MD) and Alon Friedman (MD, PhD), budget: 26,178\$ (1\$ = 3.82NIS)
- 3/2015-2/2017 Principle Investigator, **KAMIN program**, Chief Scientist at the Israeli Ministry of Economy
A User Interactive System for Medical Image Segmentation
with PI I. Shelef (MD), budget: 294,692\$ (1\$ = 3.82NIS)

EDUCATIONAL ACTIVITIES

Courses

| | | |
|----------------|---|---|
| 2017-current | <i>Introduction to Digital Image Processing</i> (mandatory, undergraduate level) | Ben-Gurion University Electrical and computer Engineering |
| 2016-current | <i>Deep learning and its applications to signal and image processing and analysis</i> (elective, graduate level) | Ben-Gurion University Electrical and computer Engineering |
| 2015-2017 | <i>Computational Methods</i> (mandatory, undergraduate level) | Ben-Gurion University Electrical and computer Engineering |
| 2013 - current | <i>Magnetic Resonance Imaging</i> (elective, graduate level) | Ben-Gurion University Electrical and computer Engineering |
| 2013 - current | <i>Introduction to Biomedical Imaging</i> (elective, undergraduate level) | Ben-Gurion University Electrical and computer Engineering |
| 2003 | Instructor <i>Principals of Operating systems</i> | Open University , Department of Computer Science |

Research students with thesis

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|---------------------|--|---|
| Shiri Gordon | 2017 (completed) | Postdoc Ben-Gurion University |
| Assaf Arbelle | 2020 (completed) | PhD Ben-Gurion University |
| Ariel Benou | 2016 (completed) Jointly with Alon Friedman | Master of Eng. Ben-Gurion University |
| Tsachi Hershkovitch | 2016 (completed) | Master of Eng. Ben-Gurion University |
| Ohad Shitrit | 2018 (completed) | Master of Eng. Ben-Gurion University |
| Boris Veselov | 2018 (completed) | Master of Eng. Ben-Gurion University |
| Topaz (Gal) Gilad | 2018 (completed) | Master of Eng. Ben-Gurion University |
| Itai Benou | 2018 (completed) | Master of Eng. Ben-Gurion University |
| Or Shwartzman | 2019 (completed) with Ilan Shelef | Master of Eng. Ben-Gurion University |
| Harel Gazit | 2019 (expected) with Ilan Shelef | towards Master of Eng. Ben-Gurion University |
| Roy Shaul | 2020 (expected) | towards Master of Eng. Ben-Gurion University |
| Itamar David | 2020 (expected) | towards Master of Eng. Ben-Gurion University |
| Mor Avi-Aharon | 2020 (expected) | towards Master of Eng. Ben-Gurion University |
| Yael Ben-Gigi | 2020 (expected) | towards Master of Eng. Ben-Gurion University |
| Tal Goldfryd | 2020 (expected) | towards Master of Eng. Ben-Gurion University |
| Tal Ben-Haim | 2021 (expected) | towards Master of Eng. Ben-Gurion University |
| Ron Sofer | 2021 (expected) | towards Master of Eng. Ben-Gurion University |
| Eliav Elul | 2019 (completed) | Master of Eng. , w/o thesis Ben-Gurion University |

SCIENTIFIC PUBLICATIONS

Journals:

1. R. Shaul, I. David, O. Shitrit, **T. Riklin Raviv**, Subsampled Brain MRI Reconstruction by Generative Adversarial Neural Networks, *Medical Image Analysis*, Volume 65, In Press, 2020.
2. G. Levakov, G. Rosenthal, I. Shelef, **T. Riklin Raviv** and G. Avidan, From a deep learning model back to the brain - identifying regional predictors and their relation to aging, *Human Brain Mapping*, In Press, 2020.
3. R. Veksler, U. Vazana, Y. Serlin, O. Prager, J. Ofer, N. Shemen, A. M. Fisher, O. Minaeva, N. Hua, R. Saar-Ashkenazy, I. Benou, **T. Riklin-Raviv**, E. Parker, G. Mumby, L. Kamintsky, S. Beyea, C. V. Bowen, I. Shelef, E. O'Keefe, M. Campbell, D. Kaufer, L. E. Goldstein and A. Friedman, Slow blood-to-brain transport underlies enduring barrier dysfunction in American football players, *Brain*, Volume 143, Issue 6, pages 1826-1842, 2020.
4. J. Levitt, P. J. Nestor, M. Kubicki, A.E. Lyall, F. Zhang, **T. Riklin-Raviv**, L.J. O'Donnell, R.W. McCarter, M.E. Shenton and Y. Rathi, Miswiring of Frontostriatal Projections in Schizophrenia, *Schizophrenia Bulletin*, In Press, January, 2020.
5. T. Gilad, J. Reyes, J.-Y. Chen, G. Lahav and **T. Riklin Raviv**, Fully Unsupervised Symmetry-Based Mitosis Detection in Time-Lapse Cell Microscopy *Bioinformatics*, Volume 35, Issue 15, 2644-2653, August 2019.
6. I. Benou, R. Veksler, A. Freidman and **T. Riklin Raviv**, Combining White Matter Diffusion and Geometry for Tract-Specific Alignment and Variability Analysis, *Neuroimage*, Volume 200, pages 674–689, October 2019.
7. S. Gordon, I. Dolgopyat, I. Kahn and **T. Riklin Raviv**, Multidimensional Co-segmentation of Longitudinal Brain MRI Ensembles in the Presence of a Neurodegenerative Process, *Neuroimage*, Vol. 178, 346–369, 2018.
8. A. Arbelle, J. Reyes, J.-Y. Chen, G. Lahav and **T. Riklin Raviv**, A Probabilistic Approach for Joint Cell Tracking and Segmentation in High-Throughput Microscopy Videos, *Medical Image Analysis*, Vol. 47, 140–152, 2018.
9. A. Benou, R. Veksler, A. Freidman and **T. Riklin Raviv**, Ensemble of Expert Deep Neural Networks for Spatio-Temporal Denoising of Contrast-Enhanced MRI Sequences, *Medical Image Analysis*, Vol. 42, pp. 145-159, 2017.
10. T. Hershkovich, T. Shalmon, O. Shitrit, N. Halay, B. Menze, I. Dolgopyat, I. Kahn, I. Shelef and **T. Riklin Raviv**, A probabilistic model for 3D interactive segmentation, *Computer Vision and Image Understanding (CVIU), Special Issue on Probabilistic Models for Biomedical Image Analysis*, Vol. 151, pp. 47–60, 2016.
11. B. Menze, K. Van Leemput, D. Lashkari, **T. Riklin-Raviv**, E. Geremia, E. Albert, et al., A generative probabilistic model and discriminative extensions for brain lesion segmentation – with application to tumor and stroke, *IEEE Transactions on Medical Imaging (TMI)*, Vol 35(4), pp 933-946, 2016.
12. B. Menze, A. Jakaby, S. Bauery, J. Kalpathy-Cramery, K. Farahaniy, J. Kirby, et al., including **T. Riklin Raviv**, The Multimodal Brain Tumor Image Segmentation Benchmark (BRATS), *IEEE Transactions on Medical Imaging (TMI)*, 34 (10), pp. 1993 - 2024, Oct. 2015.
13. **T. Riklin Raviv**, Y. Gao, J. Levitt and S. Bouix. Statistical Shape Analysis of Neuroanatomical Structures via Level-set based Shape Morphing, *SIAM Journal of Imaging Sciences*, 7(3), pp. 1645–1668, 2014.

14. Y. Gao, **T. Riklin Raviv** and S. Bouix. Shape Analysis, A Field in Need of Careful Validation, *Human Brain Mapping*. Vol. 35 (10), pp. 4965-4978, 2014
15. E. Ditttrich, **T. Riklin Raviv**, G. Kasprian, R. Donner, P. Brugger, D. Prayer and G. Langs. A spatio-temporal latent atlas for semi-supervised learning of fetal brain segmentations and morphological age estimation, *Medical Image Analysis*, 18(1), pp 9–21, January 2014.
16. C. Wählby, L. Kamentsky, Z.H. Liu, **T. Riklin Raviv**, A.L. Conery, K.L. O’Rourke, E.J. Sokolnicki, O. Visvikis, V. Ljosa, J.E. Irazoqui, P. Golland, G. Ruvkun, F.M. Ausubel and A.E. Carpenter. An image analysis toolbox for high-throughput c. elegans assays. *Nature Methods*, Vol. 9 pp 627 – 763, July 2012.
17. **T. Riklin Raviv**, K. Van Leemput, B.H. Menze, W.M. Wells and P. Golland. Segmentation of image ensembles via latent atlases. *Medical Image Analysis*, 14(5):654–665, 2010.
18. **T. Riklin Raviv**, N. Sochen and N. Kiryati. On symmetry, perspectivity, and level-set-based segmentation. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 31(8):1458–1471, 2009.
19. **T. Riklin Raviv**, N. Sochen and N. Kiryati. Shape-based mutual segmentation. *International Journal of Computer Vision*, 79:231–245, 2008.
20. **T. Riklin Raviv**, N. Kiryati, and N. Sochen. Prior-based segmentation and shape registration in the presence of projective distortion. *International Journal of Computer Vision*, 72(3):309–328, May 2007.
21. A. Shashua and **T. Riklin Raviv** The quotient image: Class-based re-rendering and recognition with varying illuminations. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 23(2):129–139, 2001.

Peer Reviewed Conference Proceedings

22. I. Benou and **T. Riklin-Raviv**, DeepTract: A Probabilistic Deep Learning Framework for White Matter Fiber Tractography, In *Medical Image Computing and Computer-Assisted Intervention (MICCAI)* pages 626–635, October 2019.
23. A. Arbelle and **T. Riklin Raviv**, Microscopy Cell Segmentation via Convolutional LSTM Networks *IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)*, April 2019.
24. O. Gorodissky, A. Sharon, A. Danov, A. Friedman, and **T. Riklin Raviv**, Symmetry-based Analysis of Diffusion MRI for the Detection of Brain impairments, *IEEE International Conference on Image Processing (ICIP)*, pages 376–379, October 2018.
25. H. Ben-Hamu Goldberg, J. Mushkin, N. Sochen and **T. Riklin Raviv**, Sampling Technique for Defining Segmentation Error Margins with Application to Structural Brain MRI, *IEEE International Conference on Image Processing (ICIP)*, pages 734–738, October 2018.
26. A. Arbelle and **T. Riklin Raviv**, Microscopy Cell Segmentation via Adversarial Neural Networks *IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)*, pages 645-648, April 2018.
27. T. Hershkovich and **T. Riklin Raviv**, Model-dependent Uncertainty Estimation of Medical Image Segmentation, *IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)*, pages 1373-1376, April 2018.
28. B. Kodner, S.H. Gordon, J. Goldberger and **T. Riklin Raviv**, Atlas of Classifiers for Brain MRI Segmentation, *International workshop on Machine Learning in Medical Imaging (MLMI)*, pages 36-44, September 2017.

29. O. Shitrit and **T. Riklin Raviv**, Accelerated Magnetic Resonance Imaging by Adversarial Neural Network, *MICCAI workshop on Deep Learning in Medical Image Analysis (DLMIA)*, pages 30–38, September 2017.
30. I. Benou, A. Friedman and **T. Riklin Raviv**, Fiber-Flux Diffusion Density for White Matter Tracts Analysis: Application to Mild Anomalies Localization in Contact Sports Players, *MICCAI Workshop on Computational Diffusion MRI*, pages 191–202, September 2017.
31. **T. Riklin Raviv**, Multinomial Level-Set Framework for Multi-Region Image Segmentation, In *6th Conference on Scale Space and Variational Methods in Computer Vision (SSVM)*, pages 386-395, June 2017
32. A. Benou, R. Veksler, A. Friedman and **T. Riklin Raviv**, De-noising of Contrast-Enhanced MRI Sequences by an Ensemble of Expert Deep Neural Networks, In *MICCAI workshop on Deep Learning in Medical Image Analysis (DLMIA)*, pages 95-110, Springer International publishing, October 2016.
33. S. Gordon, I. Dolgopyat, I. Kahn and **T. Riklin Raviv**, Co-segmentation of Multiple Images into Multiple Regions: Application to Mouse Brain MRI, In *IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)*, pages 399–402, April 2016.
34. A. Arbelle, N. Drayman, M. Bray, U. Alon, A. Carpenter, **T. Riklin Raviv** Analysis of High-throughput Microscopy Videos: Catching Up with Cell Dynamics, In *Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, pages 218–225, October 2015.
35. T. Gilad, M. A. Bray, A. E. Carpenter and **T. Riklin Raviv**, Symmetry based mitosis detection in time-lapse microscopy, In *IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)*, pages 164–167, April 2015.
36. O. Shitrit, T. Hershkovitch, T. Shalmon, I. Shelef and **T. Riklin Raviv**, Probabilistic Model for 3D Interactive Segmentation, In *MICCAI workshop on Interactive Medical Image Computing (IMIC)*, September 2014.
37. **T. Riklin Raviv**, Y. Gao, J. Levitt and S. Bouix. Statistical shape analysis for population studies via level-set based shape morphing, In *ECCV workshop on Non-Rigid Shape Analysis and Deformable Image Alignment (NORDIA)*, Lecture Notes in Computer Science, Volume 7583, pages 42–51, October 2012.
38. **T. Riklin Raviv**, K. Van Leemput and B. Menze. Multi-modal brain tumor segmentation via latent atlases, *MICCAI challenge on Multimodal Brain Tumor Segmentation*, 2012.
39. E. Dittrich, **T. Riklin Raviv**, G. Kasprian, P. Brugger, D. Prayer and G. Langs. Learning a spatio-temporal latent atlas for fetal brain segmentation. In *MICCAI workshop: Image Analysis of Human Brain Development*, September 2011.
40. C. Wählby, **T. Riklin-Raviv**, V. Ljosa, A.L. Conery, P. Golland, F.M. Ausubel and A.E. Carpenter. Resolving clustered worms via probabilistic shape model. In *IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)*, April 2010. Oral presentation.
41. **T. Riklin-Raviv**, V. Ljosa, A.L. Conery, F.M. Ausubel, A.E. Carpenter, P. Golland, and C. Wählby. Morphology-guided graph search for untangling objects: *C. elegans* analysis. In *Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, pages 634–641, September 2010.
42. **T. Riklin Raviv**, K. Van Leemput, W.M. Wells and P. Golland. Joint segmentation of image ensembles via latent atlases. In *Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, pages 272–280, 2009.

43. **T. Riklin Raviv**, B.H. Menze, K. Van Leemput, B. Stieltjes, N. Weber, M.A. Ayache, W.M. Wells and P. Golland. Joint segmentation via patient-specific latent anatomy model. In *Proc. of MICCAI Workshop on Probabilistic Models for Medical Image Analysis*, 2009.
44. N. Ben-Zadok, **T. Riklin-Raviv**, and N. Kiryati. Interactive level set segmentation for image-guided therapy. In *IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)*, 2009.
45. N. Kiryati, **T. Riklin Raviv**, Y. Ivanchenko and S. Rochel. Real-time abnormal motion detection in surveillance video. In *Proceedings of the International Conference on Pattern Recognition (ICPR)* , pages 1–4, December 2008.
46. **T. Riklin-Raviv**, N. Sochen, N. Kiryati, N. Ben-Zadok, S. Gefen, L. Bertrand and J. Nissanov. Propagating distributions for segmentation of brain atlas. In *IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)* , pages 1304–1307, 2007.
47. **T. Riklin-Raviv**, N. Sochen and N. Kiryati. Mutual segmentation with level-sets. In *IEEE Computer Society CVPR Workshop on Perceptual Organisation in Computer Vision*, 2006.
48. **T. Riklin-Raviv**, N. Kiryati and N. Sochen. Segmentation by level sets and symmetry. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 1015–1022, 2006.
49. **T. Riklin-Raviv**, N. Kiryati and N. Sochen. Prior-based segmentation by projective registration and level-sets. In *Proceedings of the International Conference on Computer Vision (ICCV)*, pages 204–211, 2005.
50. **T. Riklin-Raviv**, N. Kiryati, and N. Sochen. Unlevel-sets: Geometry and prior-based segmentation. In *Proceedings of the European Conference on Computer Vision*, volume 4 (ECCV), pages 50–61, 2004.
51. **T. Riklin-Raviv** and A. Shashua. The quotient image: Class based recognition and synthesis under varying illumination conditions. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 566–571, 1999.

Short Papers and Abstracts:

52. J. Levitt, Y. Rathi , **T. Riklin Raviv**, P. G. Nestor, L. Levin, R. McCarley and M.E. Shenton Frontostriatal dysconnectivity in Schizophrenia, In *Schizophrenia bulletin* 41, pages 263, 2015.
53. J. Levitt, Y. Rathi , **T. Riklin Raviv**, R. McCarley and M.E. Shenton Connectivity-based Parcellation of the Striatum in Schizophrenia Using Diffusion Weighted Imaging (DWI), In *Neuropsychopharmacology* 39, 221-222, 2014
54. J. Levitt, Y. Rathi, **T. Riklin Raviv**, R.W. McCarley and M.E. Shenton, DTI Connectivity-Based Parcellation of the Striatum in Schizophrenia, In *Biological Psychiatry*, 75(9), P. 375, May 2014.
55. **T. Riklin Raviv**, Y. Gao, and S. Bouix, Statistical shape analysis with modified Hausdorff distance, in *IEEE Engineering in Medicine and Biology Society (EMBS)*, 2012.

PATENTS

1. N. Kiryati, **T. Riklin Raviv**, Y. Ivanchenko, S. Rochel, Y. Dvir and D. Harari, Apparatus and methods for the detection of abnormal motion in a video stream, 2006, US Patent, US 20060045185 A1
google scholar citations: 33
2. N. Kiryati, **T. Riklin Raviv**, Y. Ivanchenko, S. Rochel, Y. Dvir and D. Harari, Apparatus and methods for the detection of abnormal motion in a video stream, 2008. European Patent EP1631073B1.