

**Ivan S. Klyuzhin, PhD**  
*Curriculum vitae*

**Postdoctoral Research Fellow**  
Department of Medicine, Division of Neurology  
University of British Columbia  
Vancouver, BC, Canada 🇨🇦

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Vancouver, BC V6T 2B5  
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**AREAS OF SPECIALIZATION**

Inverse problems and image reconstruction, 3D and 4D medical image analysis, Image denoising and enhancement, Predictive modeling, Generative disease models, Feature selection, Regularized regression, Dimensionality reduction, Artificial neural networks, Machine learning, Parkinson's disease, Neurodegeneration, Functional brain patterns, Oncology.

**EDUCATION**

*Doctor of Philosophy* February 2017  
Physics (Medical Physics)  
Department of Physics and Astronomy, University of British Columbia, Vancouver, BC, Canada  
**Thesis:** Deformable motion correction and spatial image analysis in positron emission tomography  
Available at: <https://open.library.ubc.ca/cIRcle/collections/ubctheses/24/items/1.0340673>

*Bachelor's/Master's of Science Combined* July 2006  
Physics (Medical Physics)  
Department of Bioengineering, University of Washington, Seattle, WA, USA  
Department of Physics, Ural Federal University (Ural State University), Yekaterinburg, Russia

*Minor degree* May 2005  
Technical translation (English)  
Department of Linguistics, Ural Federal University, Yekaterinburg, Russia

**PROFESSIONAL EXPERIENCE**

*BC Cancer, Vancouver, BC*  
Department of Integrative Oncology (expected start: October–November 2019)  
**Research programmer**

*University of British Columbia, Vancouver, BC*  
Department of Medicine, Division of Neurology 03/2017 – 10/2019  
**Postdoctoral research fellow**

- Initiated and led several research projects that were focused on machine-learning based image analysis and enhancement: sparse regularized regression using PCA and LASSO, feature selection using generative disease models, 4D image enhancement using deep neural nets.
- Authored or co-authored multiple peer-reviewed publications and conference presentations.
- Regularly interacted with physicians to bring state-of-the-art image analysis methods to clinical research.
- Interviewed and supervised co-op students, interns and prospective PhD students.
- Implemented effective time and task management practices.
- Contributed to multiple domestic and international research collaborations.

Department of Physics and Astronomy

01/2010 — 02/2017

**PhD student, Research/teaching assistant**

- Developed a new algorithm for 3D image reconstruction using unorganized point clouds with Voronoi cell basis functions.
- Developed a new efficient algorithm for computing line–Voronoi cell intersections in N-D using a fast k–nearest neighbor search.
- Pioneered application of texture and shape-based spatial image analyses in Brain PET imaging.
- Characterized depth-sensing cameras and developed algorithms to denoise depth data.
- Developed a pipeline to generate animated, deformable digital phantoms of rodents and other small animals.
- Authored or co-authored original research articles that were published in top journals in the field (IEEE TMI, JCBFM, Neuroimage).
- 3 years of teaching assistant experience, including two courses as head teaching assistant.

MITACS, Vancouver, BC

Globalink Research Program

04/2019 – current

**International student mentor**

- Provided health, safety, and psychological support for Globalink research interns.
- Facilitated interpersonal communication between the interns and their academic supervisors.
- Organized and facilitated regular meetings to assess the intern progress and well-being.

MetaOptima Technology Inc., Vancouver, BC

01/2014 – 09/2015

**Research and development project manager**

- Led the effort to develop image analysis algorithms, computer vision and 3D visualization tools.
- Managed several ongoing R&D efforts: image-based automated diagnosis, similarity image search and retrieval, image registration, shadow and artefact removal, contrast enhancement, object segmentation.
- Implemented a strategy for internal algorithm validation and testing.
- Planned and coordinated regular R&D meetings with focus on clear timelines and measurable outcomes.
- Interacted with the senior management, front-end and back-end development teams to implement R&D solutions in market-ready products.
- Interviewed job applicants for the R&D engineer position.
- Presented company’s research at international scientific conferences.
- Developed successful grant and fellowship applications.

University of Washington, Seattle, WA

08/2005 – 09/2009

Department of Bioengineering

**Visiting scientist**

- Developed a solution characterization pipeline that included several analytical chemistry and material science techniques: osmometry, UV-VIS spectroscopy, ICP-mass spectrometry, fluorescent/optical/confocal microscopy, turbidity analysis, infrared imaging, Schlieren imaging.
- Developed and tested a novel microfluidic device for water purification: brought an experimental concept to a proof-of-principle prototype.
- Engineered and constructed an experimental video-tracking apparatus with integrated, programmable digital controller.
- Developed a new technique to synthesize micrometer-size polymer gels.
- Supervised a team of undergraduate students.

Ural State Research Institute for Traumatology and Orthopedics,

Yekaterinburg, Russia

09/2004 – 07/2005

**Junior software engineer (part-time volunteer)**

- Helped develop a responsive application interface for medical data entry.
- Designed and implemented custom XML schemas.
- Wrote an XML Schema parser and builder to encapsulate unstructured, archival medical data.

## AWARDS AND ACHIEVEMENTS

- 1st Place poster presentation award, Postdoctoral research day, University of British Columbia Postdoctoral Association, 2018 , Vancouver, BC, Canada  
(*'Use of a 4D Deep Autoencoder to Denoise Dynamic PET Data'*)
- IEEE Medical Imaging Conference trainee awards (refereed) (2011, 2012, 2014, 2015, 2016, 2019)
- Featured poster, IEEE Medical Imaging Conference, 2015, San Diego, CA, USA  
(*'Development of a Digital Unrestrained Mouse Phantom with Non-Periodic Deformable Motion'*)
- 2nd Place poster award in Data analysis and Management, Society of Nuclear Medicine and Molecular Imaging Annual Meeting, 2013, Vancouver, BC, Canada  
(*'Investigating the effect of inter-modality ROI shape on the correlation between clinical and image-derived data in PET studies of Parkinson's disease'*)
- University of British Columbia graduate award (2010-2014), Vancouver, BC, Canada
- Izakov's Award for Outstanding Student Work in the Field of Biological and Medical Physics (2004), Ural State University, Yekaterinburg, Russia

## CO-AUTHORED GRANT APPLICATIONS (FUNDED)

- Michael J. Fox Foundation grant 09/2017 – 12/2017  
Novel quantification paradigm in Parkinson's disease neurochemical imaging:  
*Application of deep learning techniques to DaTSCAN SPECT images to improve the prediction of early cognitive decline in Parkinson's disease.*
- Mitacs Accelerate Cluster fellowship 06/2014 – 09/2015  
Automated image analysis for smartphone-based skin cancer screening  
*Deep learning based feature extraction, image search and retrieval, image registration, high and low-level handcrafted features.*
- NSERC Engage fellowship 01/2014 – 06/2014  
*An interactive 3D visualization tool for personalized, mobile-based system for skin cancer screening*

## COMMUNITY ENGAGEMENT AND SERVICE

- Partnerships and Operations Lead 03/2019 – current  
Data For Good Vancouver Leadership Team  
[Data for Good Vancouver Chapter](#)  
*Provide pro bono data analytics services to registered charities, non-governmental and not-for-profit organizations.*
- Mentor 09/2018 – 03/2019  
UBC Undergraduate research opportunities, Research EXperience ([REX](#)) program  
*Project title: Training of deep convolutional neural nets to extract radiomic signatures of tumors ([pdf](#)).*
- Paper reviewer 03/2017 – current  
Journals: IEEE Transactions on Radiation and Plasma Medical Sciences, Neuroimage: Clinical, Nuclear Instrumentation Methods in Physics Research  
*Subjects: Deep learning-based image enhancement, imaging instrumentation design, radiomics, predictive models.*

### TECHNICAL EXPERTISE

**Languages:** Matlab, Python, C/C++, Objective-C (iOS Application framework), HTML, JavaScript (beginner), SQL (beginner).

**Major libraries and frameworks:** Tensorflow, Keras, Numpy, OpenCV, Eigen, OpenGL, WebGL.

**Other:** Blender, Microsoft Kinect API,  $\text{\TeX}$ / $\text{\LaTeX}$ , ImageJ, Bash, AWS (beginner), LabView (beginner).

### PEER-REVIEWED PUBLICATIONS

- Klyuzhin, I. S., Cheng, J.-C., Bevington, C., Sossi, V. (2019). **Use of a Tracer-specific Deep Artificial Neural Net to Denoise Dynamic PET Images.** IEEE Transactions on Medical Imaging, *early access*. <https://doi.org/10.1109/TMI.2019.2927199>
- Salmanpour, M. R., Shamsaei, M., Saberi, A., Setayeshi, S., Klyuzhin, I. S., Sossi, V., Rahmim, A. (2019). **Optimized Machine Learning Methods for Prediction of Cognitive Outcome in Parkinson's Disease.** Computers in Biology and Medicine, *early access*. <https://doi.org/10.1016/j.combiomed.2019.103347>
- Sossi, V., Cheng, J.-C., Klyuzhin, I. S. (2019). **Imaging in neurodegeneration: movement disorders.** IEEE Transactions on Radiation and Plasma Medical Sciences, 3(3), 262-274. <https://doi.org/10.1109/TRPMS.2018.2871760>
- Fu, J. F., Klyuzhin, I. S., McKenzie, J., Neilson, N., Shahinfard, E., Dinelle, K., McKeown, M.J., Stoessl, A.J., Sossi, V. (2019). **Joint pattern analysis applied to PET DAT and VMAT2 imaging reveals new insights into Parkinson's disease induced presynaptic alterations.** NeuroImage: Clinical, 23, 101856. <https://doi.org/10.1016/j.nicl.2019.101856>
- Tang, J., Yang, B., Shenkov, N. N., Klyuzhin, I. S., Fotouhi, S., Davoodi-Bojd, E., Lu, L., Soltanian-Zadeh, H., Sossi, V., Rahmim, A. (2019). **Artificial neural network based prediction of outcome in Parkinson's disease patients using DaTscan SPECT imaging features.** Molecular Imaging and Biology, *early access*.
- Klyuzhin, I. S., Fu, J. F., Shenkov, N., Rahmim, A., Sossi, V. (2019). **Use of Generative Disease Models for Analysis and Selection of Radiomic Features in PET.** IEEE Transactions on Radiation and Plasma Medical Sciences, 3(2), 178-191. <https://doi.org/10.1109/TRPMS.2018.2844171>
- Fu, J. F., Klyuzhin, I., Liu, S., Shahinfard, E., Vafai, N., McKenzie, J., ... Sossi, V. (2018). **Investigation of serotonergic Parkinson's disease-related covariance pattern using [11C]-DASB/PET.** NeuroImage: Clinical, 19, 652-660. <https://doi.org/10.1016/j.nicl.2018.05.022>
- Klyuzhin, I. S., Fu, J. F., Hong, A., Sacheli, M., Shenkov, N., Matarazzo, M., ... Sossi, V. (2018). **Data-driven, voxel-based analysis of brain PET images: Application of PCA and LASSO methods to visualize and quantify patterns of neurodegeneration.** PloS One, 13(11), e0206607. <https://doi.org/10.1371/journal.pone.0206607>

- Klyuzhin, I. S., Sossi, V. (2017). **PET Image Reconstruction and Deformable Motion Correction Using Unorganized Point Clouds**. IEEE Transactions on Medical Imaging, 36(6), 1263–1275. <https://doi.org/10.1109/TMI.2017.2675989>
- Klyuzhin, I. S., Gonzalez, M., Shahinfard, E., Vafai, N., Sossi, V. (2016). **Exploring the use of shape and texture descriptors of positron emission tomography tracer distribution in imaging studies of neurodegenerative disease**. Journal of Cerebral Blood Flow and Metabolism, 36(6), 1122–1134. <https://doi.org/10.1177/0271678X15606718>
- Rahmim, A., Salimpour, Y., Jain, S., Blinder, S. A. L., Klyuzhin, I. S., Smith, G. S., ... Sossi, V. (2016). **Application of texture analysis to DAT SPECT imaging: Relationship to clinical assessments**. NeuroImage: Clinical, 12, e1–e9. <https://doi.org/10.1016/j.nicl.2016.02.012>
- O'Rourke, C., Klyuzhin, I., Park, J. S., Pollack, G. H. (2011). **Unexpected water flow through Nafion-tube punctures**. Physical Review E - Statistical, Nonlinear, and Soft Matter Physics, 83(5). <https://doi.org/10.1103/PhysRevE.83.056305>
- Klyuzhin, I. S., Ienna, F., Roeder, B., Wexler, A., Pollack, G. H. (2010). **Persisting water droplets on water surfaces**. Journal of Physical Chemistry B, 114(44), 14020–14027. <https://doi.org/10.1021/jp106899k>
- Klyuzhin, I., Symonds, A., Magula, J., Pollack, G. H. (2008). **New method of water purification based on the particle-exclusion phenomenon**. Environmental Science and Technology, 42(16), 6160–6166. <https://doi.org/10.1021/es703159q>
- Shklyar, T. F., Safronov, A. P., Klyuzhin, I. S., Pollack, G., Blyakhman, F. A. (2008). **A correlation between mechanical and electrical properties of the synthetic hydrogel chosen as an experimental model of cytoskeleton**. Biophysics, 53(6), 544–549. <https://doi.org/10.1134/S0006350908060146>

## CONFERENCE PRESENTATIONS

– 2019

- I. S. Klyuzhin, C. Bevington, J.-C. Cheng, V. Sossi, **Identification of transient neurotransmitter response using anomaly detection framework**, 2019 IEEE Nuclear Science Symposium and Medical Imaging (NSS/MIC) Conference, Manchester, United Kingdom, 2019 (*accepted*).
- J.-C. Cheng, C. Bevington, I. Klyuzhin, V. Sossi, **Simultaneously improving accuracy and precision within dynamic kernelized PET reconstruction**, 2019 IEEE Nuclear Science Symposium and Medical Imaging (NSS/MIC) Conference, Manchester, United Kingdom, 2019 (*accepted*).
- J. F. Fu, M. Matarazzo, I. Klyuzhin, J.-C. Cheng, C. Bevington, J. McKenzie, N. Neilson, E. Shahinfard, M. J. McKeown, A. J. Stoessl, V. Sossi, **Relative preservation of serotonergic function increases response to treatment in early PD**, International Congress of Parkinson's Disease and Movement Disorders, 2019, Nice, France (*accepted*).
- I. S. Klyuzhin, C. Bevington, J.-C. Cheng, V. Sossi, **Use of deep learning and physics simulations for personalized medical image enhancement**, Deep Learning and Reinforcement Learning Summer School, 2019, Edmonton, AB, Canada.
- J. Kim, S. Seo, S. Ashrafinia, A. Rahmim, V. Sossi, I. S. Klyuzhin, **Training of deep convolutional neural nets to extract radiomic signatures of tumors**, Society of Nuclear Medicine and Molecular Imaging (SNMMI) Annual Meeting, 2019, Anaheim, CA, USA.
- M. Matarazzo, I. Klyuzhin, J. A. Pineda-Pardo, Z. Anderson, J. McKenzie, N. Neilson, J. A. Obeso, V. Sossi, A. J. Stoessl, **Dopaminergic denervation in people with PD is higher in the striatal region corresponding to the upper limb**, World Parkinson Congress, 2019, Kyoto, Japan.

- M. R. Salmanpour, M. Shamsaee, A. Saberi Manesh, S. Setayeshi, I. S. Klyuzhin, V. Sossi, A. Rahmim, **Optimized machine learning methods for prediction of cognitive outcome in Parkinson's disease**, Society of Nuclear Medicine and Molecular Imaging (SNMMI) Annual Meeting, 2019, Anaheim, CA, USA.
- J. F. Fu, M. Matarazzo, I. Klyuzhin, B. Reber, J.-C. Cheng, C. Bevington, J. McKenzie, N. Neilson, E. Shahinfard, M. J. McKeown, A. J. Stoessl, V. Sossi, **Joint multimodal analysis revealed complementary spatial patterns of dopaminergic and serotonergic interactions related to levodopa response in parkinson's disease**, Brain & Brain PET 2019, Yokohama, Japan.
- J. F. Fu, I. Klyuzhin, J. McKenzie, N. Neilson, E. Shahinfard, K. Dinelle, M. J. McKeown, A. J. Stoessl, V. Sossi, **Joint pattern analysis applied to PET DAT and VMAT2 imaging reveals new insights into Parkinson's disease induced presynaptic alterations**, Brain & Brain PET 2019, Yokohama, Japan.

– 2018

- I. S. Klyuzhin, J.-C. Cheng, C. Bevington, V. Sossi, **Use of a 4D Deep Autoencoder to Denoise Dynamic PET Data**, 2018 IEEE Nuclear Science Symposium and Medical Imaging (NSS/MIC) Conference Record, Sydney, Australia, 2018.
- J.-C. Cheng, C. W. J. Bevington, A. Rahmim, I. S. Klyuzhin, J. Matthews, R. Boellaard, V. Sossi, **Dynamic PET reconstruction utilizing a spatiotemporal 4D de-noising kernel**, 2018 IEEE Nuclear Science Symposium and Medical Imaging (NSS/MIC) Conference Record, Sydney, Australia, 2018.
- C. W. J. Bevington, J.-C. Cheng, I. S. Klyuzhin, V. Sossi, **De-noising and DA release: effect of denoising on the ability to identify voxel level neurophysiological response**, 2018 IEEE Nuclear Science Symposium and Medical Imaging (NSS/MIC) Conference Record, Sydney, Australia, 2018.
- M. R. Salmanpour, M. Shamsaee, A. Saberi Manesh, S. Setayeshi, E. Taherinezhad, I. S. Klyuzhin, J. Tang, V. Sossi, A. Rahmim, **Machine learning methods for optimal prediction of outcome in Parkinson's disease**, 2018 IEEE Nuclear Science Symposium and Medical Imaging (NSS/MIC) Conference Record, Sydney, Australia, 2018.
- K. H. Leung, M. R. Salmanpour, A. S. Manesh, I. S. Klyuzhin, V. Sossi, A. K. Jha, M. G. Pomper, Y. Du, A. Rahmim, **Using deep-learning to predict outcome of patients with Parkinson's disease**, 2018 IEEE Nuclear Science Symposium and Medical Imaging (NSS/MIC) Conference Record, Sydney, Australia, 2018.
- J. Fu, I. Klyuzhin, E. Shahinfard, J. McKenzie, N. Neilson, T. Baumeise, S. McCormick, J.-C. Cheng, A. Felicio, M. McKeown, A. J. Stoessl, V. Sossi, **Clinical Correlates of Complementary Spatial Patterns in [11]C-DTBZ, [11]C-MP, [11]C-RAC, and [11]C-DASB PET Images Revealed by Multiset Canonical Correlation Analysis in Parkinson's Disease**, Proc. Intl. Symp. on Functional Neuroreceptor Mapping of the Living Brain (NRM), London, UK, July 2018.
- I. S. Klyuzhin, N. Shenkov, A. Rahmim, V. Sossi, **Use of deep convolutional neural networks to predict Parkinson's disease progression from DaTscan SPECT images**, Society of Nuclear Medicine and Molecular Imaging Annual Meeting, Philadelphia, PA, USA; J. Nucl. Med., vol. 59 (suppl. 1): 29, 2018.

– 2017

- I. Klyuzhin, N. Vafai, E. Shahinfard, V. Sossi, **The impact of parameter bound selection in the simplified reference tissue method on the accuracy and quality of parametric images**, 2017 Society of Nuclear Medicine and Molecular Imaging Annual Meeting, Denver, CO, USA; J Nucl Med., vol. 58 (suppl. 1): 359, 2017.
- N. Shenkov, I. Klyuzhin, S. Fotouhi, E. Davoodi-Bojd, H. Soltanian-Zadeh, A. Rahmim, V. Sossi, **A metric to quantify DaTSCAN tracer uptake in subjects with Parkinson's disease computed**

- without MRI-based regions of interest**, 2017 Society of Nuclear Medicine and Molecular Imaging Annual Meeting, Denver, CO, USA; J. Nucl. Med., vol. 58 (suppl. 1): 291, 2017.
- I. Klyuzhin, J. Fu, N. Shenkov, N. Vafai, E. Shahinfard, J. McKenzie, N. Neilson, K. Dinelle, M. Sacheli, J. Stoessl, A. Rahmim, V. Sossi, **Striatal Neurodegeneration Patterns in Parkinson's Disease Identified using PET Imaging and PCA**, 2017 Organization of Human Brain Mapping Annual Meeting, Vancouver, BC, Canada.
  - J. Fu, I. Klyuzhin, S. Liu, E. Shahinfard, N. Vafai, N. Heffernan, J. Mckenzie, M. Sacheli, H. F. Wehrl, M. J. McKeown, A. J. Stoessl, V. Sossi, **Altered Serotonergic Network Connectivity in Parkinson's Disease and LRRK2 Mutation Subjects**, 2017 Organization of Human Brain Mapping Annual Meeting, Vancouver, BC, Canada.
  - I. Klyuzhin, M. Sacheli, N. Vafai, E. Shahinfard, B. Lakhani, J. Neva, J. Fu, J. McKenzie, N. Neilson, K. Dinelle, L. Boyd, A. Stoessl, V. Sossi, **Correlation analysis between dopamine release in striatal sub-regions and motor impairment in Parkinson's disease subjects**, 2017 International Congress of Parkinson's Disease and Movement Disorders, Vancouver, BC, Canada; Mov Disord. 2017; 32 (suppl 2).
  - N. Shenkov, I. Klyuzhin, A. Rahmim, V. Sossi, **A neuroimaging-based model for disease progression in Parkinson's disease**, 2017 International Congress of Parkinson's Disease and Movement Disorders, Vancouver, BC, Canada; Mov Disord. 2017; 32 (suppl 2).
- 2016
- M. A. Sacheli, B. Lakhani, J. L. Neva, D. K. Murray, N. Vafai, J. McKenzie, N. Neilson, K. Dinelle, I. S. Klyuzhin, L. A. Boyd, V. Sossi, A. J. Stoessl, **Aerobic exercise can induce dopamine release in Parkinson's disease: [11C]Raclopride PET study**, 2016 Neuroscience Meeting, Program No. 415.28. San Diego, CA: Society for Neuroscience, Nov 14, 2016.
  - I. Klyuzhin, J. Fu, N. Shenkov, A. Rahmim, V. Sossi, **Sub-regional pattern analysis of heterogeneous PET tracer distribution employed for disease assessment**, 2016 IEEE Nuclear Science Symposium and Medical Imaging (NSS/MIC) Conference Record, Strasbourg, France, Nov 2, 2016.
  - I. Klyuzhin, V. Sossi, **Nuclear Emission-based Imaging in the Study of Brain Function**, Fall Meeting of the APS Division of Nuclear Physics, Vancouver, BC, Oct 16, 2016.
  - J. Fu, N. Vafai, E. Shahinfard, N. M. Neilson, J. Mckenzie, R. Mabrouk, I. Klyuzhin, A. J. Stoessl, V. Sossi, **Investigation of Parkinson's Disease Related Covariance Pattern in the Serotonergic System using [11C]-DASB/PET**, Proc. Intl. Symp. on Functional Neuroreceptor Mapping of the Living Brain (NRM), Boston, MA, Jul 15, 2016.
  - R. Mabrouk, I. Klyuzhin, E. Shahinfard, N. Vafai, J. Fu, S. Blinder, M. Walker, A. Rahmim, V. Sossi, **Exploring feature-based approaches to assess neuroinflammation in patients with Parkinson's disease: a PBR28 PET imaging study**, Proc. Intl. Symp. on Functional Neuroreceptor Mapping of the Living Brain (NRM), Boston, MA, Jul 14, 2016.
  - A. Rahmim, Y. Salimpour, S. Jain, S. Blinder, I. Klyuzhin, G. Smith, Z. Mari, and V. Sossi, **Application of texture analysis to DaTscan images for enhanced assessment of progression in Parkinson's disease**, Annual Meeting of the Society of Nuclear Medicine and Molecular Imaging (SNMMI), San Diego, CA, Jun 11-15, 2016.
  - A. Rahmim, Y. Salimpour, S. Blinder, I. Klyuzhin, V. Sossi, **Optimized Haralick texture quantification to track Parkinson's disease progression from DAT SPECT images**, Annual Meeting of the Society of Nuclear Medicine and Molecular Imaging (SNMMI), San Diego, CA, Jun 11-15, 2016.
- 2015
- I. Klyuzhin, G. Stortz, V. Sossi, **Development of a Digital Unrestrained Mouse Phantom with Non-Periodic Deformable Motion**, 2015 IEEE Nuclear Science Symposium and Medical Imaging (NSS/MIC) Conference Record, San Diego, CA, Nov 6, 2015.

- I. S. Klyuzhin, S. Blinder, R. Mabrouk, A. Rahmim, V. Sossi, **Investigation of Texture Quantification Parameters for Neurological PET Image Analysis**, 2015 IEEE Nuclear Science Symposium and Medical Imaging (NSS/MIC) Conference Record, San Diego, CA, Nov 4, 2015.
- I. Klyuzhin, M. Sadeghi, V. Sossi, M. S. Atkins, **Comparison of the spatial heterogeneity features for classification of dermoscopic lesion images**, World Dermatology Congress, Vancouver, BC, Jun 6, 2015.
- I. Klyuzhin, M. Razmara, N. Hazar, V. Sossi, M. Sadeghi, **Feasibility of using 3D body visualization on smartphones for personalized mapping of skin lesions**, World Dermatology Congress, Vancouver, BC, Jun 8, 2015.
- A. Benam, M. Sadeghi, I. S. Klyuzhin, M. S. Atkins, **A hybrid color and structure analysis for automated detection of arborising vessels in dermoscopy images**, World Dermatology Congress, Vancouver, BC, Jun 8, 2015.
- I. Klyuzhin, M. Sadeghi, V. Sossi, M. S. Atkins, **Evaluation of methods to quantify color non-uniformity in dermoscopic images**, World Dermoscopy Congress, Vienna, Apr 16, 2015.
- A. Benam, M. Sadeghi, I. Klyuzhin, M. S. Atkins, **DermSocial: Dermoscopy made social: a mobile and web tool for dermoscopy training and practice**, World Dermoscopy Congress, Vienna, April 16, 2015.
- I. Klyuzhin, M. Sadeghi, S. Atkins, V. Sossi, **Using Moment Invariants as Measures of Lesion Color Asymmetry**, 2015 American Academy of Dermatology Annual Meeting, San Francisco, CA, May 8, 2015.

– 2014

- G. Stortz, M. D. Walker, I. Klyuzhin, V. Sossi, **Advanced Arc Correction to Improve Sinogram Consistency and Increase Contrast in Analytic and Statistical PET Reconstruction**, 2014 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) Record, Seattle, WA, Nov 8, 2014.
- I. S. Klyuzhin, E. Shahinfard, M. Gonzalez, V. Sossi, **Feasibility of Using Geometric Descriptors of Tracer Distribution for Disease Assessment**, 2014 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) Record, Seattle, WA, Nov 8, 2014.
- S. A. L. Blinder, I. Klyuzhin, M. E. Gonzalez, A. Rahmim, V. Sossi, **Texture and Shape Analysis on High and Low Spatial Resolution Emission Images**, 2014 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) Record, Seattle, WA, Nov 8, 2014.
- I. S. Klyuzhin, G. Stortz, V. Sossi, **PET Image Reconstruction with Correction for Non-periodic Deformable Motion**, 2014 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) Record, Seattle, WA, Nov 8, 2014.

– 2013 and earlier

- I. Klyuzhin, M. Gonzalez, V. Sossi, **Investigating the effect of inter-modality ROI shape on the correlation between clinical and image-derived data in PET studies of Parkinson’s disease**, Annual Meeting of the Society of Nuclear Medicine and Molecular Imaging (SNMMI), Vancouver, BC, May 1, 2013.
- I.S. Klyuzhin, M. Gonzalez, V. Sossi, **Fully-Automated Segmentation of the Striatum in the PET/MR Images Using Data Fusion**, 2012 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) Record, Anaheim, CA, Oct 27, 2012.
- I. S. Klyuzhin, K. Dinelle, V. Sossi, **PET Image Reconstruction and Motion Correction using Direct Backprojection on Point Grids and Clouds**, 2011 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) Record, Valencia, Spain, Oct 23, 2011.
- I. S. Klyuzhin, V. Sossi, **PET Image Reconstruction Using Point-Based Filtered Backprojection**, 2011 Joint AAPM/COMP Meeting, Vancouver, BC, Jul 31, 2011.



- B. Chai, I. Klyuzhin, L. Marshall, K. Nagornyak, K. Ovchinnikova, R. Stahlberg, A. Wexler, H. Yoo, Q. Zhao, G. H. Pollack, **Unexpectedly critical role of hydrophilic surfaces on nearby water**, 3rd Annual Conference on the Physics, Chemistry and Biology of Water, West Dover, VT, Oct 16, 2008.
- B. Chai, I. S. Klyuzhin, L. Marshall, K. Nagornyak, K. Ovchinnikova, R. Stahlberg, A. Wexler, H. Yoo, Q. Zhao, G. H. Pollack, **Long-range water Structuring at Hydrophilic Interfaces**, Third Annual Conference on the Physics, Chemistry and Biology of Water, West Dover, VT, Oct 16, 2008.
- F. Blyakhman, I. Klyuzhin, G. Pollack, A. Safronov, T. Shklyar, **Possible role of the cytoskeleton in creating the cell's electrochemical potential: a synthetic gel model**, 4th world Congress of Cellular and Molecular Biology, Poitiers, France, October 07 – 12, 2005.