MATTHEW GETZIN

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Wauwatosa, WI 53226

I am an X-ray imaging scientist with unique hardware and software experience for the development of spectral CT modalities. I have modeled X-ray interactions and imaging configurations using MCNP, MATLAB, and the Photon-counting toolkit (PcTK). I have developed methods for multimodal image registration and material identification in spectral CT data using nonlinear classification techniques. I have a profound interest in the low-dose radiation effects on living organism which requires a fundamental understanding of the physics governing X-ray photon interaction with matter.

I also have experience in developing computer vision algorithms using MATLAB and Python. My algorithmic focuses have included multimodal image registration and material identification of spectral CT data using nonlinear machine learning techniques. Most recently, I have been deploying MATLAB packages for simulating spectral CT data to be used in training TensorFlow networks.

In my spare time, am building a PDF mining/grouping tool using OCR and graph theory tools.

EMPLOYMENT

GE Healthcare, Waukesha, Wisconsin — April, 2019 - Present
CT Systems Scientist, Manager: Roy Nielsen

EDUCATION

PhD, Rensselaer Polytechnic Institute, Biomedical Engineering Department — March, 2019
GPA: 3.760/4.000

MS, Rensselaer Polytechnic Institute, Biomedical Engineering Department — December, 2015
GPA: 3.760/4.000

BE, Vanderbilt University, Biomedical Engineering — May, 2012
GPA: 3.621/4.000

RELEVANT PUBLICATIONS

Getzin, M, Garfield JJ, Rundle DS, Kruger U, Gkikas M, Wang G. (2018) *Increased separability of K-edge nanoparticles by photon-counting detectors for spectral micro-CT*. Journal of X-ray Science and Technology 26(5): 707-726.

Smith, K, Getzin, M, Garfield JJ, Suvarnapathaki S, Camci-Unal G, Wang G, Gkikas M. (2019) *Nanophsophor-based contrast agents for spectral X-ray imaging.* Nanomaterials 9(8), 1092.

COMPUTER SKILLS

Programming: MATLAB, Python, TensorFlow, OCR, Mathematica, Solidworks, SketchUp, bash scripting, MCNP, R, GimpShop, Adobe Illustrator, LaTeX

RELEVANT RESEARCH EXPERIENCE

Rensselaer Polytechnic Institute, Troy, NY April, 2013 – March, 2019
Graduate Researcher, Ge Wang, Ph.D.

- Multiple chip geometric calibration for spectral micro-CT imaging system
- Development of computer vision algorithms for material identification/quantification in spectral CT
- Development of the methods needed for molecular imaging of nanomaterials
- Extensive use of MATLAB and Python for imaging simulations, reconstruction, and analysis
- Used MCNP to model X-ray physics in imaging system
- Advancing project focused on multi-physics coupling of CT and MRI
- Expanding optogenetic applications through use of nanoparticles and X-ray
- Developed X-ray electroretinography system for small animals
- Adapted patch-clamp system for use with pulsed X-ray as stimulation
- Prototyped computer vision and computational linguistics tools incorporating TensorFlow and OCR

Albert Einstein College of Medicine, Bronx, NY Summer 2014 & Summer 2015
Analytic Consultant, Mark Wagshul, Ph.D.

- Developed segmentation and analytic tools for clinical brain imaging lab
- Wrote bash wrapper for NODDI analysis implementations (DTI model)
- Worked in HIPAA regulated environment

PATENTS PENDING

Getzin M, Berry R, Gjesteby L, Ge Wang. “X-optogenetics/U-optogenetics.” (Patent #20160166852)

EXTENDED PUBLICATIONS

Getzin M, Gjesteby L, Chuang YJ, McCallum SA, Cong W, et. al. (2016) *Exploring the Modulation of Magnetic Resonance Relaxation Parameters Through the Use of High Energy Electromagnetic Radiation and Semiconducting Nanoparticles.* JSM Biomedical Imaging Data Pap 3(1): 1005.

Getzin M, Berry R, O’Brisky A, Li G, Kang J, et. al. (2017) *Re-Visiting X-ray Electroretinography*. JSM Biomedical Imaging Data Pap 4(1): 1009.

Getzin M, Gjesteby L, Chuang YJ, McCallum S, Cong W, et al. (2014). A pilot study on coupling CT and MRI through use of semiconductor nanoparticles. arXiv preprint arXiv:1412.7554.

PRESENTATIONS

SPIE Developments in X-Ray Tomography X Conference, Podium August 30, 2016
Getzin, M., Yang QS, Cong WX, and G. Wang.
“Enhancing spatial resolution for spectral micro-CT with aperture encoding.”

BME Graduate Student Symposium, Podium January 21, 2015
Getzin, M. and G. Wang
“CT-MRI Registration and Exploratory Statistics”

Northeast Bioengineering Conference (NEBEC), Poster April 18, 2015
Getzin, M., L. Gjesteby, S. McCallum, W. X. Cong, and G. Wang
"Investigation into multiphysics coupling via semiconducting nanophosphors."

SPIE Developments in X-Ray Tomography IX Conference, Poster August 18, 2014
Getzin, M., Y. Xu, P. Krefenberg, S. Madi, Ali Bahadur, M.R. Lennartz, and G. Wang.
"Carotid plaque characterization using CT and MRI imaging acquisition and synergistic image analysis."

NY Innovates Conference, Rensselaer Polytechnic Institute, Poster December 17, 2013
Getzin, M., Y. Xu, P. Krefenberg, S. Madi, Ali Bahadur, M.R. Lennartz, and G. Wang. "Diagnostic Assessment of Carotid Plaque Stability Utilizing Combined CT/MRI Modality."

Albany Medical College, Poster September 24, 2013
Xu, Y., M. Getzin, P. Krefenberg, G. Wang, S. Madi, and M.R. Lennartz. "Diagnostic Assessment of Carotid Plaque Stability Utilizing Combined CT/MRI Modality."

Collegiate Inventors Competition November 12, 2012
Resurgico: Innovative Drug Delivery System for Injured Peripheral Nerves
Getzin, Matthew, Morgan Amsler, Fadi Azer, Jessica Campos, and Jeff Savin

EXTENDED RESEARCH EXPERIENCE

Albert Einstein College of Medicine, Bronx, NY Summer 2014 & Summer 2015
Analytic Consultant, Mark Wagshul, Ph.D.
- Developed segmentation and analytic tools for clinical brain imaging lab
- Wrote bash wrapper for NODDI analysis implementations (DTI model)
- Worked in HIPAA regulated environment

Rensselaer Polytechnic Institute, Troy, NY October, 2012 – March, 2013
Graduate Researcher, Mariah Hahn, Ph.D.
- Synthesized and tested PEG gels
- Maintained cell lines
- RT-PCR

Nashville VA Medical Center, Nashville, TN Nov, 2011- May, 2012
Undergraduate Researcher, Jeffrey Davidson, Ph. D.
- Maintained cell lines
- Helped in the development of an *in vitro* scar model

Cook Biotech, West Lafayette, IN May, 2011-Aug, 2011
Research Intern, Eric Rodenberg, Ph.D.
- Performed basic cell culture to maintain multiple cell lines
- Assay experience: Live/Dead, AlamarBlue, Cytotoxicity tests, ELISAs, etc.

Vanderbilt University, Nashville, TN Aug, 2010-May, 2011
Undergraduate Researcher, Craig Duvall, Ph. D.
- Used RAFT polymerization techniques to make diblock polymers
- Characterized possible CT contrasting agents

University of South Carolina, Columbia, SC May, 2010-Aug, 2010
Undergraduate Researcher, Esmaiel Jabarri, Ph. D.

- Synthesized peptides
- Ran cellular uptake tests using pre-synthesized peptide-conjugated nanoparticles

COMMUNITY SERVICE

Head Coach at Troy Central Little League, Troy, NY April, 2016 – July 2016

Module Leader for Exploring Engineering Day, Troy, NY February, 2013

Big Brothers Big Sisters, Albany (Capitol Region), NY October, 2012 – October, 2013

Vanderbilt Students Volunteer for Science (VSVS), Nashville, TN January, 2011 – May, 2012

Head Coach Lafayette Youth Baseball, Lafayette, IN May, 2011 – June 2011

HONORS AND AWARDS

Founders Award of Excellence, RPI, Troy, NY 2018
Awarded for embodiment of creativity, discovery, leadership, pride and responsibility while at RPI

Most Valuable Teacher's Assistant, RPI, Troy, NY 2018
For work in "Modelling of Biomedical Systems" and "Bioimaging and Bioinstrumentation"

NIH-sponsored Summer School: Adaptive Neurotechnologies 2016
3-week course focused on the development of new adaptive neurotechnologies/brain-computer interfaces

Collegiate Inventors Competition Finalist 2012
Design group was nationally recognized for design of drug delivery system for peripheral nerves

Tau Beta Pi: Engineering Honors Society 2011
Merit and Character-based Membership

Order of Omega 2011
Merit-based Honorary Society for Greek Students

William Northern Scholarship 2011
Merit and Need-based Vanderbilt Scholarship

NSF REU Grant 2010

Elk's National Foundation Most Valuable Student Scholarship 2008-2012