Andrew R. Janowczyk, Ph.D.

andrew.janowczyk@case.edu
andrewjanowczyk.com

Objective
Develop scalable data analysis techniques to facilitate impactful cancer research through clinical collaboration

Experience
11 years: Enterprise software development
7 years: Digital histopathology image analysis in cancer domain
5 years: Start-up co-founder and Chief Science Officer
3 years: Applications of deep learning

Education

Ph.D. of Computer Science	IIT Bombay, Mumbai, India	2014
Masters of Computer Science	Rensselaer Polytechnic Institute	2004
Bachelor of Science in Computer Science	Troy, New York, USA	2004
Bachelor of Science in Mathematics		2004

Awards

Excellence in Ph.D. Thesis	IIT Bombay	2014
Young Scientist Award (Runner-up)	MICCAI, London	2010
Best Poster Award	ICVGIP, Bhubaneswar	2008
Nobel Peace Prize	IAEA, Vienna	2005

The United Nations International Atomic Energy Agency (IAEA) received the Nobel Peace Prize for non-proliferation efforts. Received a certificate acknowledging significance of contributed work.

Work History

Research Associate | Case Western Reserve University (CWRU)   9/13-Present
Cleveland, United States

The Center of Computational Imaging and Personalized Diagnostics (CCIPD) is involved in developing, evaluating and applying novel quantitative image analysis, signal processing, segmentation, multi-modal co-registration, and machine learning tools for disease diagnosis, prognosis, and theragnosis in the context of breast, prostate, ovarian and colon cancers.
- Designed and actualized a deep learning workflow in use by 7+ colleagues on over 10 clinical challenges yielding comparable or superior results to state of the art approaches in: (a) nuclei segmentation, (b) epithelium segmentation, (c) tubule segmentation, (d) lymphocyte detection, (e) mitosis detection, (f) invasive ductal carcinoma detection, and (g) lymphoma sub-type identification (Caffe, Matlab, Python, Theano, Pylearn2)
- Developed reusable methodological and technical protocols to support colleagues' clinical collaboration via hosted interactive annotation tools and leverage of the high performance computing networks of both CWRU and the Ohio Super Computing Cluster (HPC, Bisque)
- Research in prognosis prediction, image standardization, and tumor infiltrating lymphocytes
- Conceive, plan, and oversee various undergraduate, MS, and Ph.D. projects

Chief Science Officer & Co-Founder | Searchbox   6/09-9/13
Geneva, Switzerland

Searchbox integrated proprietary text analytics and semantic search technologies into a scalable Enterprise Search as a Service platform. This powerful search framework, federating across multiple data sources, provided organizations with a singular consolidated interface facilitating an improved search experience via personalized facets, filters, and templates.
- Responsible for the research, development, and implementation of all proprietary algorithms including large-scale custom semantic search and unsupervised categorization technologies (Java, Solr, Lucene, MySQL, Matlab/Octave, REST, HPC, AWS)
- Managed off-shore development team, designed and oversaw quality control process of semantic engine and backend Solr-plugins (Git/SVN, Junit, Jenkins, Selenium)
- IT administration tasks include design, implement and maintain both internal cloud and client cloud instances to meet strict HA-SLAs for proprietary API (Xen, Debian, AWS, JMeter)
- As Co-founder and Board of Director involved in key decisions leading to a CHF 4M valuation

Applications Manager | First Solutions Limited   9/05- 9/10
China, Germany, Nigeria

As the Applications Manager for an oil consultancy firm based in China provided various software services for Royal Dutch Shell PLC. Experience includes management and coordination to aid in the monitoring and planning of construction, commissioning, and handover phases at the Afam Okoloma Gas Plant in Nigeria. On-site responsibilities included development and implementation of a large scale project completions and tracking system (PCTS) prototype and management of Nigerian nationals to ensure data integrity and consistency while expanding overall functionality and performance. Coordinated efforts as the liaison between disciplines to establish a complete and fully represented data flow system, resulting in an unprecedented level of knowledge management and information clarity. While working in Germany with the IMPaC design team maintained sole responsibility for the creation of an information management plan and served as interim Data Controller. Additional responsibilities include coordination with graphics designers to create interactive experience-agnostic training material.

Software Engineer | International Atomic Energy Agency (IAEA)   9/04-9/05
Vienna, Austria

One of three engineers that developed the Common Inspection On-site Software Package (CIOSP) used by Safeguards inspectors to insure the security of nuclear material worldwide. Refactored user interfaces, improved "make" build and deployment processes, integrated additional modules and improved functionality of base framework. Written in VB 6 modeling Microsoft's MMC snap-in design technology due to IAEA regulations requiring full access to source code.

Graduate Research Student | Rensselaer Polytechnic Institute   9/03-6/04
Troy, United States

Master's thesis research in computer vision under the supervision of Prof Qiang Ji at the Intelligent system laboratory (ISL). Designed and implemented a hybrid Particle Filter/Adaptive Expectation-Maximization Gaussian Mixture algorithm that allows for the real time tracking of an unknown number of targets through a dynamically changing environment. Resulted in a robust real-time C/OpenCV implementation that was able to outperform the current industry standard. Project was later combined in to a complete low-resolution real-time facial recognition application, providing an accurate area for the recognition to take place, allowing real-time operations of both tasks designed for the United States Department of Defense.

Software Engineer – Intern | Computer Associates   6/02-9/02
Islandia, United States   6/03-9/03

Designed and implemented a browsing algorithm that improved efficiency of backup solution Brightstor by ~97%, using MS SQL, C/C++, Java and XML. Merged the final version into backend APIs of the current production code base. Managed a high school intern, ensuring timely completion of his projects and conformance to company standards.

Patents

1. "High-throughput biomarker segmentation utilizing hierarchical normalized cuts", **A. Janowczyk**, S. Chandran, A. Madabhushi, WO2011034596A1
2. "Color standardization for digitized histological images", **A. Janowczyk**, A. Basavanhally, A. Madabhushi, WO2015061631A1
3. "Systems & methods for multi-protocol registration and tissue classification using local morphologic scale", **A. Janowczyk**, S. Chandran, A. Madabhushi WO2012097189A1

Publications

1. **Janowczyk A.,** Gilmore H., Madabhushi A., "Deep learning for image analysis tasks in digital pathology: A comprehensive tutorial with selected applications in lymphoma, colorectal and breast cancer", Trans Medical Imaging, 2015 (under review)
2. **Janowczyk A.,** Basavanhally A., Madabhushi A., "Stain Normalization In Histopathology Using Sparse Auto-Encoders", Trans Medical Imaging, 2015 (under preparation)
3. **Janowczyk A.,** Doyle S., Gilmore H., Madabhushi, "A resolution adaptive hierarchical deep learning scheme applied to nuclear segmentation in histology images", Journal Pathology Informatics, 2015 (under preparation)
4. Romo-Bucheli D., **Janowczyk A.**, Romeroa R., Gilmore H., Madabhushi A., "Automated Tubule Nuclei Quantification and Correlation with Oncotype DX risk categories in ER+ Breast Cancer

Whole Slide Images", SPIE, 2015

5. **Janowczyk A.**, Doyle S., Gilmore H., Madabhushi A.,"A resolution adaptive hierarchical deep learning scheme applied to nuclear segmentation in histology images", MICCAI, DLMIA workshop, 2015

6. Penzias G., **Janowczyk A.**, Singanamalli A., Rusu M., Shih N., Feldman M.D. , Viswanath S., Madabhushi A. "AutoStitcherTM: An Automated Program for Accurate Reconstruction of Digitized Whole Histological Sections From Tissue Fragments", Modern Pathology, 2015

7. **Janowczyk A.**, Advisors: Chandran S., Madabhushi A., "Automatic Detection and Classification of Tumor Infiltrating Lymphocytes", Ph.D. Thesis, Indian Institute of Technology Bombay, 2014

8. **Janowczyk A.**, Chandran S., Madabhushi A., "Quantifying local heterogeneity via morphologic scale: Distinguishing tumoral from stromal regions" Journal of Pathology Informatics, 2013

9. **Janowczyk A.**, Chandran S. Singh R., Sasaroli D., Coukos G., Feldman M.D., Madabhushi A. "High-Throughput Biomarker Segmentation on Ovarian Cancer Tissue Microarrays via Hierarchical Normalized Cuts." Trans Biomed Eng 2012

10. **Janowczyk A.**, Chandran S., Feldman M.D., Madabhushi A., "Local morphologic scale: application to segmenting tumor infiltrating lymphocytes in ovarian cancer TMAs". SPIE 2011

11. **Janowczyk A.,** Chandran S., Feldman M.D., Madabhushi A., "Quantifying Tumor Infiltrating Lymphocytes in Ovarian Cancer TMAS." United States and Canadian Academy of Pathology Annual Meeting (USCAP), 2011

12. Xu J., **Janowczyk A.**, Chandran S., Madabhushi A.,, "A high-throughput active contour scheme for segmentation of histopathological imagery." Medical Image Analysis, 2011.

13. Xu J., **Janowczyk A.**, Chandran S., Madabhushi A., "A weighted mean shift, normalized cuts initialized color gradient based geodesic active contour model: applications to histopathology image segmentation." SPIE 2010

14. Xu J., Sparks R., **Janowczyk A.**, Tomaszewski J.E., Feldman M.D., Madabhushi A. "High-Throughput Prostate Cancer Gland Detection, Segmentation, and Classification from Digitized Needle Core Biopsies". Workshop on Prostate Cancer Imaging: Computer-Aided Diagnosis, Prognosis, and Intervention (in conjunction with MICCAI), 2010

15. **Janowczyk A.**, Chandran S. Singh R., Sasaroli D., Coukos G., Feldman M.D., Madabhushi A., "Hierarchical Normalized Cuts: Unsupervised Segmentation of Vascular Biomarkers from Ovarian Cancer Tissue Microarrays. MICCAI 2009

16. **Janowczyk A**., Aluru S., Chandran S." Fast, Processor-Cardinality Agnostic PRNG with a Tracking Application." ICVGIP 2008

17. **Janowczyk A**., Advisor: Ji Q., "Adaptive background modeling for human tracking", Master's Thesis, Rensselaer Polytechnic Institute (RPI), 2004

Technical Skills

Keywords: biomedical image analysis, digital histopathology, cancer, deep learning, scalable big-data analytics, machine learning, natural language processing, semantic search, high performance, distributed/cloud and GPU computing
Languages: Matlab/Octave, R, Python, C/C++, Java, JS, VB, PHP, SQL, bash, REST, Latex
Frameworks: Caffe, Theano, Pylearn2, Bisque, OpenCV, Solr, Lucene, ManifoldCF, Cuda
Software Development: Git, SVN, Make/CMake, Ant, Maven, Selenium, JUnit

Reviewer

IEEE Transactions on Medical Imaging (TMI), IEEE Transactions on Biomedical Engineering (TBME), IEEE Journal of Biomedical and Health Informatics (JBHI), Journal of Pathology Informatics (JPI), Neurocomputing, Med. Image Comput. and Comput. Assisted Interv. (MICCAI), Nordic Symposium on Digital Pathology

Continuing Education

HarvardX - Data Analysis for Genomics   2015
    PH525.1x Statistics and R for the Life Sciences
    PH525.2x: Introduction to Linear Models and Matrix Algebra
    PH525.3x: Advanced Statistics for the Life Sciences
    PH525.4x: Introduction to Bioconductor
    PH525.5x: Case study: RNA-seq data analysis
    PH525.6x: Case study: Variant Discovery and Genotyping
    PH525.7x: Case study: ChIP-seq data analysis
    PH525.8x: Case study: DNA methylation data analysis

Languages

English	Native	**Mandarin**	Fair
Greek	Moderate	**German**	Basic
French	Moderate		

Nationality

USA
Greece