

Eric Wait

Advanced imaging modalities | Quantitative image analysis | Multimodal data integration | Cross-disciplinary leadership

Education

- 2019 **Ph.D. in Electrical and Computer Engineering**, *Drexel University*, Philadelphia, PA
Dissertation: *5D GPU Accelerated Analysis, Visualization, and UI for Biological Microscopy Applications*.
Developed signal-processing algorithms in C/C++, CUDA, DirectX, MATLAB, and Python to analyze large-scale microscopy datasets; enhanced workflows for accurate, reproducible biological image interpretation.
- 2012 **M.S. in Computer Science**, *University of Wisconsin*, Milwaukee, WI
Thesis: *Visualization and Correction of Auto-Segmentation, Tracking, and Lineage of Stem Cells from Images*.
Applied low-level algorithms in C/C++ and MATLAB for multidimensional image analysis; improved UI tools for manual correction and validation of segmentation/tracking results.
- 2010 **B.S. in Computer Science**, *University of Wisconsin*, Milwaukee, WI

Work Experiences

- 2021–2025 **Principal Data Scientist**, *Elephas Biosciences*, Madison, WI
Led cross-platform C/C++/C# systems development, advanced signal processing, and interdisciplinary teams to deliver high-performance imaging solutions for research and field deployment.
 - Applied GPU-accelerated image processing and device control systems to fluorescence and bright-field microscopy workflows; enabled multi-site reproducibility in oncology research.
 - Developed and deployed analysis pipelines integrating ML classifiers for biomarker detection, increasing diagnostic confidence in live-tissue imaging experiments.
 - Directed cross-functional teams spanning biology, engineering, and software, translating research needs into robust technical solutions adopted across multiple lab sites.
 - Instituted validation workflows ensuring reproducibility, regulatory alignment, and stakeholder consensus.
- 2017–2021 **Data Scientist**, *HHMI, Janelia Research Campus*, Ashburn, VA, Advanced Imaging Center
Applied low-level programming, GPU optimization, and signal processing to massive time-lapse imaging datasets; guided researchers toward impactful experimental designs using advanced microscopes.
 - Applied DirectX and CUDA pipelines to fluorescence and multiphoton microscopy data, enabling high-fidelity visualization and preprocessing for large-scale biological studies.
 - Developed feature extraction and tracking workflows for terabyte-scale datasets, improving robustness and accuracy of biological interpretations.
 - Advised on experimental designs to ensure biological relevance while maximizing cutting-edge imaging systems.
- 2015–2019 **High Performance Computing Consultant**, *Winter Wait Consulting LLC*, Sterling, VA
Developed and deployed optimized solvers for large-scale transportation problems, emphasizing memory efficiency and algorithmic optimality; trained and guided teams across technical and strategic domains.
 - Applied C/C++ and Python optimization routines to transportation network models, enabling faster scenario analyses and improved decision-making for real-world logistics challenges.
 - Collaborated with mathematicians to integrate novel algorithmic approaches, improving solution accuracy and applicability in operational research contexts.
 - Advised senior leadership on solution architecture and HPC resource allocation for global logistics modeling.
 - Mentored developers in solver design, memory management, and performance tuning for distributed systems.
- 1998–2019 **Command Post Superintendent**, *Air National Guard*, Minneapolis, MN
Held **Top Secret** clearance. Led mission-critical communication and coordination between senior leadership and HQ during wartime and humanitarian operations. Supervised and trained personnel in Command and Control protocols, developed Air Force-wide training systems, and streamlined classified information workflows under high-pressure conditions.
- 2012–2017 **Ph.D. Research Assistant**, *Drexel University*, Philadelphia, PA, Dr. Andrew Cohen's lab
- 2011–2012 **M.S. Research Assistant**, *University of Wisconsin*, Milwaukee, WI, Dr. Andrew Cohen's lab

Professional Skills

Extensive experience applying low-level programming, GPU acceleration, hardware integration, and modern development workflows to advanced imaging modalities and scientific analysis environments.

Languages	C/C++/C#, Python, MATLAB, Mathematica, Java, LISP, Perl, SQL, CUDA
Imaging Techniques	Fluorescence: wide field, confocal, multi-view, light-sheet, SIM, iPALM; Phase-contrast: Lifetime: FLIM; Optical Coherence Tomography: OCT; Electron Microscopy; Slide-scanning: bright field, fluorescence; Correlative: FLIM–Histology, OCT–FLIM, SIM–EM;
Analysis	Imaris, Dragonfly, Fiji/ImageJ, MATLAB, Python, custom C++/CUDA pipelines
Hardware	Microscope control systems, RAID/NAS, multi-camera and multi-GPU setups, advanced display arrays
Visualization	Photoshop, Illustrator, Blender, Figma, scientific figure preparation, visual pipeline planning

Service

2020-2021	Review Editor , <i>Frontiers in Bioinformatics</i>
2020-2021	DEI Committee Member , <i>HHMI President's Office</i>
2019-2020	Webinar Coordinator and Technical Support , <i>Imaging Africa</i>
2018-2021	Crisis Action Team Advisor , <i>Janelia Research Campus</i>

Patents

2019	Cohen, A., Dion, G., Winter, M., Wait, E. , Koerner, M., <i>Finger-worn Device with Compliant Textile Regions</i> , US 10,466,784
	Cohen, A., Dion, G., Winter, M., Wait, E. , Koerner, M., <i>Wearable Devices, Wearable Robotic Devices, Gloves, and Systems, Methods, and Computer Program Products Interacting with the Same</i> , US 10,248,200
2016	Bailey, T., Colletti, B., Wait, E. , King, A., Gandhi, B., <i>Parallel Processing for Solution Space Partitions</i> , US 20160335568A1

Honors

2015	Koerner Family Fellowship , <i>Drexel University</i> , Philadelphia, PA
2014 & 2019	Meritorious Service Medal , <i>United States Air Force</i> , Minneapolis, MN Highest peacetime award given to senior non-commissioned officers.

Invited Talks

2020	Speaking Qualitatively: Effectively communicating your research , <i>Inaugural Pair-up Meeting for Black American Biologists</i>
2019	Quantifying Cellular “Dynamics”: A conversation between Biologists and a Data Scientist , <i>Syracuse University</i>
2017	GPU Processing and Visual Validation of Lattice Lightsheet Data (with bonus 3D Kymographs) , <i>Janelia Research Campus</i>
2015	Collaborative Visualization in the Browser for Segmentation, Tracking, and Lineaging with 5-D Biological Microscopy Images , <i>Bioinformatics Conference</i> Normalized Covariance Image Stitching Technique for Rigid Registration of Microscope Tiles , <i>Bioinformatics Conference</i>
2014	Visualization and Correction of Automated Segmentation, Tracking and Lineaging from 5-D Stem Cell Image Sequences , <i>4th Symposium on Biological Data Visualization</i> , Boston, MA Communal Stereoscopic Visualization of 5-D Fluorescence Images with Segmentation Embedded , <i>Neural Stem Cell Institute</i> , Albany, NY

Publications

Select authored and co-authored publications in high-impact journals spanning imaging, computation, and interdisciplinary science. Full list with links at <https://ericwait.com/pubs>

- 2024 Liu C. et al., **Wait E.**, Assessing cell viability with dynamic optical coherence microscopy, ***Biomedical Optics Express*** — optical imaging, cell viability
- 2023 Sinclair R. et al., **Wait E.**, Spatiotemporal dynamics of cell plate development during plant cytokinesis, ***Molecular Biology of the Cell*** — live-cell imaging, plant biology
- Sinclair R. et al., **Wait E.**, 4D quantitative analysis of cell plate development in Arabidopsis using lattice light sheet microscopy, ***Journal of Experimental Botany*** — 4D imaging, growth-phase analysis
- 2022 Hari-Gupta Y. et al., **Wait E.**, Myosin VI regulates spatial organisation of mammalian transcription initiation, ***Nature Communications*** — molecular motor regulation
- Dos Santos Á. et al., **Wait E.**, Binding partners regulate unfolding of myosin VI to activate the molecular motor, ***Biochemical Journal***
- Colin-York H. et al., **Wait E.**, Quantifying molecular dynamics within complex cellular morphologies using LLSM-FRAP, ***Small Methods***
- 2021 Moore A. et al., **Wait E.**, Actin cables and comet tails organize mitochondrial networks in mitosis, ***Nature*** — mitochondrial organization
- Zhao X. et al., **Wait E.**, 3D image analysis of the ventricular-subventricular zone stem cell niche, ***Stem Cell Reports***
- 2020 **Wait E.**, Reiche M., Chew T., Hypothesis-driven quantitative fluorescence microscopy: The importance of reverse-thinking in experimental design, ***Journal of Cell Science*** — methods, experimental design
- 2019 **Wait E.**, Winter M., Cohen A., Hydra Image Processor: 5-D GPU image analysis library with MATLAB/Python wrappers, ***Bioinformatics*** — GPU software library
- Aaron J. et al., **Wait E.**, Practical considerations in particle and object tracking and analysis, ***Current Protocols in Cell Biology***
- Winter M. et al., **Wait E.**, Separating touching cells using pixel-replicated elliptical shape models, ***IEEE Transactions on Medical Imaging***
- 2017 Valm A. et al., **Wait E.**, Applying systems-level spectral imaging to reveal the organelle interactome, ***Nature*** — spectral imaging
- 2016 Caino M. et al., **Wait E.**, A neuronal network of mitochondrial dynamics regulates metastasis, ***Nature Communications***
- Winter M. et al., **Wait E.**, LEVER: Software tools for segmentation, tracking, and lineaging, ***Bioinformatics***
- 2014 **Wait E. et al.**, Visualization and correction of automated segmentation, tracking, and lineaging in 5-D stem cell image sequences, ***BMC Bioinformatics*** — microscopy algorithms
- 2011 Winter M. et al., **Wait E.**, Vertebrate neural stem cell segmentation, tracking, and lineaging with validation/editing, ***Nature Protocols***