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# Eric Wait

Core Competencies: Real-time data pipelines GPU acceleration Performance optimization Cross-platform systems

## Professional Summary

Experienced Principal Data Scientist and systems engineer with 10+ years designing GPU-accelerated pipelines and delivering sub-second data processing for terabyte-scale sensor streams.

Tested Expert in modern C, C++, C#, CUDA, MATLAB, multi-threading programming, memory management, and performance optimization in real-time applications.

Accomplished Established CI/CD workflows, GitLab/Git-based DevOps practices, and automated unit and system-level testing frameworks to accelerate deployment cycles by 40%.

Directed Led cross-functional teams through agile development cycles, coordinating software architecture, requirements verification, and iterative deliverables.

## 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*.
Engineered signal-processing algorithms in C, C++, CUDA, DirectX, MATLAB, and Python for terabyte-scale data analysis, leveraging numerical optimization and real-time visualization to maximize accuracy and speed.

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*.
Developed low-level algorithms in C, C++ and MATLAB for large-scale multidimensional data analysis, with an interactive UI.

2010 **B.S. in Computer Science**, *University of Wisconsin*, Milwaukee, WI

## Professional Skills

Extensive experience applying machine-level programming GPU acceleration, hardware integration, and modern development workflows spanning research, deployment, and production systems.

Languages C, C++, C#, Python, MATLAB, SQL, CUDA, DirectX, OpenGL, Mathematica, Java, LISP, Perl

Data Systems SQL databases, distributed computing (OpenMP, cluster scheduling), machine learning (clustering, classification, SVM), deep learning (YOLO, neural networks), statistical analysis (hypothesis testing, Bayesian), real-time streaming, data quality frameworks

DevOps Git, CMake, Docker, AWS (EC2), Azure (compute, pipelines), GitHub Actions, CI/CD workflows, Conda, vcpkg, NuGet

Tools VSCode, Visual Studio, Jupyter, Jira, Emacs/Vi, Azure DevOps, Copilot, ChatGPT, Claude

Hardware Embedded systems, custom workstation/server builds, RAID/NAS systems, multi-CPU/GPU setups, redundant architectures, advanced and stereoscopic display arrays

Vis & Design Blender, Figma, VTK, Photoshop, Premiere, Illustrator, Imaris, Dragonfly, visual pipeline planning

Leadership Led hardware, software, research, development, and operations collaborations; translating requirements to production systems

## Patents

2019 Cohen, A., Dion, G., Winter, M., **Wait, E.**, Koerner, M., *Finger-worn Device with Compliant Textile Regions, US 10,466,784; Wearable Robotic Devices, US 10,248,200*

2016 Bailey, T., Colletti, B., **Wait, E.**, King, A., Gandhi, B., *Parallel Processing for Solution Space Partitions, US 20160335568A1*

## Work Experiences

2021–2025 **Principal Data Scientist**, *Elephas Biosciences*, Madison, WI

Architected GPU-accelerated data acquisition and processing for real-time analysis; led cross-functional teams to deliver high-performance solutions integrating hardware control, signal processing, and analytical workflows.

- Engineered C, C++, C# data pipelines processing terabyte-scale sensor streams with sub-second latency; exposing unified APIs to Python and MATLAB, reducing analysis runtime by 60%.
- Designed database architectures for multimodal data integration with quality metrics, traceability, and reproducibility across multiple deployment sites.
- Established Git workflows, CI/CD pipelines (Azure Pipelines, GitHub Actions), and automated testing frameworks, accelerating cross-platform deployment by 40%.
- Developed novel scanning method reducing acquisition time from 45 minutes to 5 minutes (9x faster) while decreasing raw data volume by 16x and maintaining equivalent analysis accuracy.
- Coordinated software backlog prioritization and sprint planning in agile cycles, aligning deliverables with architectural constraints and milestone targets.
- Managed blended teams of FTEs and contractors, adapting motivation and communication strategies to diverse working relationships and business constraints.
- Led software development team through novel microscopy system integration, providing technical mentorship while balancing performance goals with cost and timeline constraints.

2017–2021 **Data Scientist**, *HHMI, Janelia Research Campus*, Ashburn, VA, Advanced Imaging Center

Applied GPU optimization and signal processing to massive time-lapse datasets; built scalable processing infrastructure spanning laptops to HPC clusters.

- Built DirectX and CUDA pipelines for multidimensional data visualization and preprocessing, scaling dynamically from laptops to HPC clusters (25K+ cores, 400 GPUs).
- Engineered GPU-accelerated feature extraction and tracking algorithms handling 100s of terabytes *per visitor*, achieving 60x speed-ups through combined algorithmic optimization and parallel compute acceleration.
- Developed data quality assessment tools and automated validation frameworks for reproducibility across distributed processing environments.
- Advised 170+ international scientists annually on experimental design and data collection strategies, working across cultural, linguistic, and time-zone differences to maximize scientific impact within critical 2-week experimental windows.
- Coordinated across biology, engineering, and computational teams to translate research needs into technical solutions, bridging domain expertise gaps to deliver cohesive outcomes.

2015–2019 **High Performance Computing Consultant**, *Winter Wait Consulting LLC*, Sterling, VA

Developed and deployed optimized solvers for large-scale transportation problems; trained teams across technical and strategic domains.

- Implemented custom C, C++ and Python optimization routines applying advanced combinatorial methods to achieve over 100x performance improvements.
- Engineered parallelization strategies using OpenMP and distributed scheduling across compute clusters, reducing runtime from *days* to *hours*.
- Advised senior leadership on solution architecture, HPC resource allocation, and performance benchmarking.

1998–2019 **Command Post Superintendent**, *Air National Guard*, Minneapolis, MN

Held Top Secret clearance. Led mission-critical communications and personnel training in high-pressure operational environments.

## Publications

Technical publications demonstrating expertise in GPU acceleration, real-time data processing, and high-performance computing systems. Full list of 25+ pubs at `https://ericwait.com/pubs`

2021 Moore A. et al., **Wait E.**, *Actin cables organize mitochondrial networks in mitosis*, ***Nature***

2020 **Wait E.,** Reiche M., Chew T., *Hypothesis-driven quantitative fluorescence microscopy*, ***JCS***

2019 **Wait E.,** Winter M., Cohen A., *Hydra Image Processor: 5-D GPU image analysis library with MATLAB/Python wrappers*, ***Bioinformatics***

2017 Valm A. et al., **Wait E.**, *Systems-level spectral imaging to reveal the organelle interactome*, ***Nature***

2014 **Wait E. et al.**, *Visualization and correction of automated segmentation, tracking, and lineaging in 5-D stem cell image sequences*, ***BMC Bioinformatics***

## Awards & Honors

2015 **Koerner Family Fellowship**, *Drexel University*, Philadelphia, PA

2014 & 2019 **Meritorious Service Medal**, *United States Air Force*, Minneapolis, MN
Highest peacetime award given to senior non-commissioned officers.

2020-2021 **Review Editor**, *Frontiers in Bioinformatics*

2018-2021 **Crisis Action Team Advisor**, *Janelia Research Campus*

## Leadership & Collaboration

### Collaboration

Advised 170+ international scientists annually on experimental design and data collection strategies, working across cultural, linguistic, and time-zone differences to maximize scientific impact within critical 2-week experimental windows.

Coordinated across biology, engineering, and computational teams to translate research needs into technical solutions, bridging domain expertise gaps to deliver cohesive outcomes.

Maintained calm, effective collaboration under pressure, ensuring teams stayed aligned when experimental timelines and resource constraints demanded precision.

Evaluated visitor proposals with tact and precision, providing constructive feedback that improved experimental design and aligned expectations with facility capabilities.

Led cross-functional collaboration with marketing, finance, and operations teams to align technical deliverables with company-wide strategic goals.

Managed blended teams of FTEs and contractors, adapting motivation and communication strategies to diverse working relationships and business constraints.

### Communication

Communicated directly with senior leadershipbase commanders and Pentagon officialsin mission-critical scenarios, delivering clear, actionable information under high-pressure conditions (Top Secret clearance, 21 years military service).

Bridged strategy and execution by translating business objectives into technical roadmaps, ensuring daily work remained aligned with long-term company vision.

Rapidly learned diverse scientific domains to communicate effectively with researchers, translating complex technical capabilities into accessible guidance tailored to each visitor's expertise.

Maintained professional, effective communication with executives and senior leaders across military, academic, and startup environments, providing respectful input without hierarchy-driven hesitation.

Orchestrated mission-critical information flow across organizational sections in command post environments, ensuring timely dissemination to multiple stakeholders with diverse priorities.

### Mentorship

Trained and mentored personnel in high-stakes environments, instilling composure and judgment needed to make real-time decisions under pressure.

Built and led microscope operator team, developing training programs that ensured consistent, high-quality data collection practices across the organization.

Led software development team through novel microscopy system integration, providing technical mentorship while balancing performance goals with cost and timeline constraints.

Provided subtle, well-timed guidance to leadership during high-pressure situations, surfacing overlooked information and facilitating coordination without overstepping boundaries.

### Strategy

Think globally across organizational objectives, connecting "why" to tactical solutions to identify prescient challenges and optimal approacheswhether internal development, delegation, or external partnerships.

Collaborated with marketing and finance leadership to understand resource allocation, messaging coherence, and market positioning, bringing financial and strategic awareness to technical decision-making.

Balance deep optimization with knowing when to pivot, avoiding sunk cost fallacy by maintaining childlike curiosity and willingness to challenge status quo for disruptive improvements.

Achieved greater impact through delegation, mentorship, and clear expectation-setting than individual execution, recognizing when to leverage team strengths over personal technical contribution.

Gained strategic insight from startup leadership exposure, understanding how internal operations alignor driftfrom external messaging, enabling proactive issue identification and course correction.