

Brian Yang

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Education: University of Illinois at Urbana-Champaign (2014 - 2018)
Bachelor of Liberal Arts & Sciences (LAS) Physics
Concentration in Energy/Sustainability

Current Location:
Los Angeles, CA

Experience & Certifications:

Department of Defense (DoD) - TS Security Clearance (2021 - present)

Group/Team Lead (August 2023 - present)

Applied Research Associates (Cypress, CA)

- Leading the Computational Physical Sciences Physics-Informed Machine Learning (CPS PI-ML) group within the Applied Electromagnetic Division (AED) in Cypress, CA.
- Responsible for managing and going after new work (both internal to the team and cross-division collaborations) - finding BAA's and putting together a team to write white papers or proposals in response to RFIs & RFPs.
- Responsible for managing technical experts within the group and hiring new engineers & strategic hires.
- Responsible for team's budget allocations, ensuring that direct labor costs are met and satisfy indirect labor costs such as IRAD and proposal efforts.
- Developed solutions that solved problems of national interest for various DoD and IC research agencies.
- Lead capture for the AFRL/Ry Farsight Combat ID program, securing \$300k in R&D funding.
- Lead capture for the ARL DEVCOM C5ISR AI-Based ATR (ABA) program, securing \$2M in R&D funding.
- Lead team & won the DARPA CIDAR Semifinal Challenge.

Staff Computational Physicist (June 2020 - present)

Applied Research Associates (Cypress, CA)

- Developed optimized, multi-node/multi-GPU frameworks for training large automatic target recognition (ATR) models.
- Developed techniques for utilizing masked autoencoders for the purposes of identifying occluded and under-represented targets. Benchmarked against baseline ResNet18 classifier with MSTAR dataset using synthetic occlusions. Technique shows orders of magnitude improvement even for minimally occluded targets.
- Developed techniques for utilizing masked autoencoders for rejecting confusers for Synthetic Aperture Radar (SAR) ATR applications.
- Lead small team to develop physics-informed AI/ML models for ATR applications in multiple different domains under a \$24M program.
- Presented on the algorithms developed under multiple classified programs that enhanced the DoD's ATR capabilities at the 2026 ATR Working Group (ATRWG).
- Architected and implemented a modular ATR framework that was used to train and test the design of digital twins.
- Developed, maintained, and tested software that solves Maxwell's equations for BI, FE-BI, ABC, and DDM problems with extremely large unknowns.
- Developed and implemented an incremental solver that reinitialized and solves for changing material properties defined by impedance boundary conditions (IBC). Greatly increased productivity for solving problems with small changes, often not having to re-compute >99% of the original impedance matrix.
- Addressed memory leak issues affecting niche, large memory (>300 GB) problems that affected the ability for large problems to be solved without crashing on resource limited supercomputing systems.

- Utilized gdb, valgrind, and gperftools to diagnose memory fragmentation issues caused by improper low level memory allocation/deallocation handling.
- Discovered and addressed issues relating to OMP parallelization with mesh optimizations (file I/O).
- Used CUBIT to model and generate 3D finite element meshes in order to simulate and produce plots such as monostatic radar cross-sections.
- Parallelized and optimized computational electromagnetics code using task dependency graphs and integrated MPI routines in order to distribute work across multiple ranks.
- Ran problems with extremely large unknowns using multiple nodes in a cluster (HPCs) using TORQUE PBS & Slurm to queue jobs.
- Developed, implemented, and wrote documentation for Fortran to C callback routines in order to provide an interface between customer's code and ARA's libraries.
- Assisted in setting up environments and software for new 16-node & 32-node air-gapped clusters.
- Constantly giving technical updates and presentations to customers either in email or meetings (both in-person and online).

Skills & Technologies:

- Experience in both Linux (10+ years) and Windows (15+ years) systems
 - Experience in Computational Electromagnetics
 - Experience in physics-informed Artificial Intelligence/Machine Learning (AI/ML)
 - Experience in Business Development & Capture
 - Experience in Whitepaper and Proposal Writing
 - Native English speaker and fluent in Korean (10+ years), N5 Japanese
 - Strong communication, time management, discipline, and leadership skills
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| • Python, C++, Fortran90, Java | • Microsoft Office, Google Suites |
| • PyTorch, Matplotlib, NumPy | • gperftools, Valgrind, GDB |
| • HTML, JS, CSS, Vue | • CUBIT, FEKO, Creo, Sony Vegas |
| • Intel MKL, Boost, BoostMPI | • OriginLab, MatLab |
| • OpenMPI, MPICH, IntelMPI | • Bash, Makefile, CMake |
| • GitLab, GitHub, Redmine, Jenkins | • Git, Vim, Visual Studio |

Achievements:

- FY23 ARA Technical Achievement Award - Fast Compressed Matrix Solver (CMPACK)
- FY25 ARA Technical Achievement Award - Digital Design Framework, Radar Modeling
- CY26 DARPA CIDAR Challenge Semifinalist