Adam Richie-Halford

Director of Technology & Innovation

adamrh@stanford.edu richiehalford@gmail.com richiehalford.org github.com/richford
linkedin.com/in/richiehalford

EDUCATION

2013–2020 **Ph.D. Physics, University of Washington, Seattle, WA**
Thesis: Quantum Monte Carlo Studies of the BCS-BEC crossover.

2008–2010 **M.S. Physics, California State University, Long Beach, CA**
Thesis: Numerical modeling of the singlet proximity effect in a superconductor-ferromagnet trilayer. Graduate Dean's List (top 1%).

2001–2006 **B.S. Engineering Physics, Embry-Riddle Aeronautical University, Daytona Beach, FL**
Summa Cum Laude, Minor in Mathematics.

EMPLOYMENT HISTORY

2023–present **Director of Technology & Innovation**
Stanford University, ROAR / Graduate School of Education

- Lead a cross-functional team of six engineers (and growing) to scale a web-based educational assessment platform to 309 districts, 2,708 schools, 160,000+ users, and 873,000+ assessment runs.
- Define and execute the technical roadmap for the platform, including systems architecture, feature development, and data security enhancements.
- Develop and oversee the technology budget to ensure alignment with strategic priorities.
- Consulting data scientist and research software engineer.

2022–2023 **Postdoctoral Scholar**
Stanford University, ROAR / Developmental-Behavioral Pediatrics

- Developed browser-based assessments for the deep phenotyping of dyslexia.
- Investigated white matter developmental trajectories associated with preterm birth.
- Supported lab scientists in data science and research software engineering.

2020–2022 **UW Data Science Postdoctoral Fellow**
University of Washington, eScience Institute

- Developed statistical techniques and software for analysis of diffusion MRI data.
- Explored correlates of childhood adversity in white matter development.

2013–2020 **Graduate Research Assistant**
University of Washington, Department of Physics

- Ph.D. in nuclear theory, performing Monte Carlo simulations on world's largest supercomputers.
- Interdisciplinary collaboration in neuroimaging, machine learning, and cloud computing.

2014 **Visiting Graduate Researcher**
Institute for Advanced Computational Science, SUNY Stony Brook, NY

- Developer on open-source high-performance computing environment for peta-scale supercomputers.

2011–2013 **Rural Health Educator**
United States Peace Corps, Kingdom of Morocco

- Designed and managed federally funded projects to create youth health education programs at local schools.
- Combated water-borne diseases through education programs and bathroom infrastructure projects.

2009–2010 **Lead Space Systems Analyst**
United States Air Force, Los Angeles Air Force Base, El Segundo, CA

- Led utility analysis of future space systems; developed stochastic simulations for satellite operations.
- Program manager for $8M USD software to evaluate space systems with 75+ DoD & industry users.

2008–2009 **Visiting Scientist**
NASA Jet Propulsion Laboratory, Communications Ground Systems, Pasadena, CA

- Analyzed radio scintillation data from Cassini, pioneering new space weather measurement technique.

- Received Air Force Association General Phillips Award for Outstanding Young Scientist of the Year.

2007–2010 **Graduate Research Assistant**
California State University, Long Beach, Department of Physics and Astronomy

- Developed numerical routines to find supercurrent in magnetic multilayers.

2006–2008 **Systems Engineer**
United States Air Force, Los Angeles Air Force Base, El Segundo, CA

- Led team of 21 to form tech investment plan linking $2.4B lab budget to $12B satellite R&D portfolio.
- Technical experience in spacelift, precision navigation & timing, remote sensing systems.

RESEARCH PUBLICATIONS

Articles

1. Yeatman JD, Tran JE, Burkhardt AK, Ma WA, Mitchell JL, Yablonski M, Gijbels L, Townley-Flores C, **Richie-Halford A**. Development and validation of a rapid and precise online sentence reading efficiency assessment. *Frontiers in Education*, 9, 2024. doi
2. Roy E, Van Rinsveld A, Nedelec P, **Richie-Halford A**, Rauschecker AM, Sugrue LP, Rokem A, McCandliss BD, Yeatman JD. Differences in educational opportunity predict white matter development. *Developmental Cognitive Neuroscience*, 67, 2024. doi
3. Kruper J, **Richie-Halford A**, Benson NC, Caffarra S, Owen J, Wu Y, et al.. Convolutional neural network-based classification of glaucoma using optic radiation tissue properties. *Communications Medicine*, 4(72), 2024. doi
4. Caffarra S, Karipidis II, Kruper J, Kubota E, **Richie-Halford A**, Takada M, Rokem A, Yeatman JD. Assessing white matter plasticity in a randomized controlled trial of early literacy training in preschoolers. *bioRxiv*, 2024. doi
5. Ramamurthy M, Kanopka K, **Richie-Halford A**, Domingue B, Pei F, Bell P, Yan L, Hartsough A, Gorno-Tempini ML, Yeatman JD. Design and Validation of a Rapid Visual Processing Measure for Screening Reading Difficulties in Early Childhood. *PsyArXiv*, 2024. doi
6. Bhat KG, Mogan AD, Saavedra A, Fuentes-Jimenez M, Siebert JM, Ma WA, Townley-Flores C, **Richie-Halford A**, et al.. Shared and Unique Influences of Phonological Processing on Reading and Math. *OSF Preprints*, 2024. doi
7. Grotheer M, Bloom D, Kruper J, **Richie-Halford A**, Zika S, Aguilera González VA, Yeatman JD, Grill-Spector K, Rokem A. Human white matter myelinates faster in utero than ex utero. *Proceedings of the National Academy of Sciences*, 120(33), 2023. doi
8. Ma WA, **Richie-Halford A**, Burkhardt A, Kanopka K, Chou C, Domingue B, Yeatman JD. ROAR-CAT: Rapid Online Assessment of Reading ability with Computerized Adaptive Testing. *PsyArXiv*, 2023. doi
9. Rokem A, Qiao J, Yeatman JD, **Richie-Halford A**. Incremental improvements in tractometry-based brain-age modeling with deep learning. *bioRxiv*, 2023. doi
10. Kruper J, **Richie-Halford A**, Benson NC, Caffarra S, Owen J, Wu Y, Lee AY, Lee CS, Yeatman JD, Rokem A. Specific and non-linear effects of glaucoma on optic radiation tissue properties. *bioRxiv*, 2023. doi
11. **Richie-Halford A**, Cieslak M, Ai L, Caffarra S, Covitz S, Franco AR, et al.. An analysis-ready and quality controlled resource for pediatric brain white-matter research. *Scientific Data*, 9(616), 2022. doi
12. Roy E, **Richie-Halford A**, Kruper J, Narayan M, Bloom D, Brown TT, Jernigan TL, McCandliss BD, Rokem A, Yeatman JD. White matter and literacy: a dynamic system in flux. *bioRxiv*, 2022. doi
13. Caffarra S, Kanopka K, Kruper J, **Richie-Halford A**, Roy E, Rokem A, Yeatman JD. Development of the alpha rhythm is linked to visual white matter pathways and visual detection performance. *bioRxiv*, 2022. doi
14. Kruper J, Yeatman JD, **Richie-Halford A**, Bloom D, Grotheer M, Caffarra S, Kiar G, Karipidis II, Roy E, Chandio BQ, Garyfallidis E, Rokem A. Evaluating the reliability of human brain white matter tractometry. *Aperture Neuro*, 2021. doi
15. **Richie-Halford A**, Narayan M, Simon N, Yeatman J, Rokem A. Groupyr: Sparse Group Lasso in Python. *Journal of Open Source Software*, 6(58), 2021. doi
16. Cieslak M, Cook PA, He X, Yeh FC, Dhollander T, Adebimpe A, et al. (incl. **Richie-Halford A**). QSIPrep: an integrative platform for preprocessing and reconstructing diffusion MRI data. *Nature Methods*, 2021. doi
17. **Richie-Halford A**, Yeatman J, Simon N, Rokem A. Multidimensional analysis and detection of informative features in human brain white matter. *PLOS Computational Biology*, 17(6), 2021. doi
18. **Richie-Halford A**, Drut JE, Bulgac A. Emergence of a Pseudogap in the BCS-BEC Crossover. *Physical Review Letters*, 125(6), 2020. doi
19. **Richie-Halford A**, Rokem A. Cloudknot: A Python Library to Run your Existing Code on AWS Batch. *Proceedings of the 17th Python in Science Conference (SciPy 2018)*, 8–14, 2018. doi

20. Yeatman JD, **Richie-Halford A**, Smith JK, Keshavan A, Rokem A. A browser-based tool for visualization and analysis of diffusion MRI data. *Nature Communications*, 9(940), 2018. doi
21. Harrison RJ, Beylkin G, Bischoff FA, Calvin JA, Fann GI, et al. (incl. **Richie-Halford A**). MADNESS: A Multiresolution, Adaptive Numerical Environment for Scientific Simulation. *SIAM Journal on Scientific Computing*, 38(5), 2016. doi
22. Baker TE, **Richie-Halford A**, Bill A. Classification of magnetic inhomogeneities and 0-π transitions in superconducting-magnetic hybrid structures. *Physical Review B*, 94(10), 2016. doi
23. Baker TE, **Richie-Halford A**, Icreverzi OE, Bill A. Cascading proximity effects in rotating magnetizations. *EPL (Europhysics Letters)*, 107(1), 2014. doi
24. Baker TE, **Richie-Halford A**, Bill A. Long range triplet Josephson current and 0-π transitions in tunable domain walls. *New Journal of Physics*, 16(9), 2014. doi
25. Baker TE, Icreverzi OE, **Richie-Halford A**, Bill A. Classical Mechanical Analogies in Wide Dirty SFS Junctions. *Journal of Superconductivity and Novel Magnetism*, 25(7), 2012. doi
26. Bill A, de Rojas J, Baker TE, **Richie-Halford A**. Properties of Magnetic-Superconducting Proximity Systems. *Journal of Superconductivity and Novel Magnetism*, 25(7), 2012. doi
27. **Richie-Halford A**, Iess L, Tortora P, Armstrong JW, Asmar SW, Woo R, Habbal SR, Morgan H. Space-time localization of inner heliospheric plasma turbulence using multiple spacecraft radio links. *Space Weather*, 7(12), 2009. doi

Theses

1. **Richie-Halford A**. Quantum Monte Carlo studies of the BCS-BEC crossover. *Ph.D. Dissertation, University of Washington, Seattle, WA*, 2020.
2. **Richie-Halford A**. Numerical modeling of the singlet proximity effect in a superconductor-ferromagnet trilayer. *M.S. Thesis, California State University, Long Beach, CA*, 2010.

Selected Presentations and Posters

1. **Richie-Halford A**, Cieslak M, Adebimpe A, Covitz S, Hagen M, Kruper J, Lyu M, Miranda-Dominguez O, Houghton A, Fair D, Yeatman J, Satterthwaite T, Rokem A. NiRV: the NeuroImaging Report Viewer. *Poster, OHBM 2022, Glasgow*, 2022.
2. Kruper J, Benson N, **Richie-Halford A**, Caffarra S, Owen J, Wu Y, Lee A, Lee C, Yeatman J, Rokem A. The optic radiations representing the foveal and peripheral visual fields age differently. *Poster, OHBM 2022, Glasgow*, 2022.
3. Grotheer M, Bloom D, Kruper J, Narayan M, **Richie-Halford A**, Aguilera González V, Yeatman J, Grill-Spector K, Rokem A. Spatiotemporal differences in preterm infants' bundles are linked to slower ex utero myelination. *Poster, OHBM 2022, Glasgow*, 2022.
4. **Richie-Halford A**, Cieslak M, Franco AR, Sydnor VJ, Yeatman J, Ai L, Milham M, Satterthwaite TD, Rokem A. A Preprocessed Open Diffusion Derivatives Dataset from the Healthy Brain Network. *Poster, OHBM 2021*, 2021.
5. Roy E, **Richie-Halford A**, Narayan M, Kruper J, Rokem A, Yeatman J. White matter networks predict development of reading and math abilities. *Poster, OHBM 2021*, 2021.
6. Kruper J, Yeatman J, **Richie-Halford A**, Bloom D, Grotheer M, Caffarra S, Kiar G, Karipidis I, Roy E, Rokem A. Evaluating the reliability of diffusion-MRI based tractometry. *Poster, OHBM 2021*, 2021.
7. Narayan M, Simon N, **Richie-Halford A**, Rokem A, Yeatman J. Nonparametric causal analysis of brain and cognition, applied to developmental neuroimaging. *Poster, OHBM 2021*, 2021.
8. **Richie-Halford A**, Yeatman J, Simon N, Rokem A. Multidimensional analysis and detection of informative features in human brain white matter. *Poster, ISMRM/SMRT 2021*, 2021.
9. Joseph M, Pisner D, **Richie-Halford A**, Lerma-Usabiaga G, Mansour S, Kent JD, Keshavan A, Cieslak M, et al.. dMRIPrep: a robust preprocessing pipeline for diffusion MRI. *Poster, ISMRM/SMRT 2021*, 2021.
10. Bisson M, Romero J, Kurth T, Fatica M, Damasceno PF, Xie X, **Richie-Halford A**, Koudoro S, Garyfallidis E, Rokem A. GPU-accelerated diffusion MRI tractography in DIPY. *Poster, ISMRM/SMRT 2021*, 2021.
11. Kruper J, Yeatman JD, **Richie-Halford A**, Bloom D, Grotheer M, Caffarra S, Kiar G, Karipidis II, Roy E, Chandio BQ, Garyfallidis E, Rokem A. The test-retest reliability and robustness of diffusion-MRI based tractometry. *Poster, ISMRM/SMRT 2021*, 2021.
12. **Richie-Halford A**, Yeatman J, Simon N, Rokem A. Relating brain connections to behavior in the era of brain observatories. *Presentation, eScience Institute Postdoc Seminar 2021*, 2021.
13. **Richie-Halford A**, Yeatman J, Simon N, Rokem A. Multidimensional analysis and detection of informative features in human white matter. *Invited talk, Neural Computation and Engineering Connection 2021*, 2021.
14. Bartley J, Kent J, Levitis E, Moraczewski D, Rapuano K, **Richie-Halford A**, Salo T, Poline JB, Ghosh S, Kennedy D, Laird A. ABCD-ReproNim: A free online course providing training for reproducible analyses of ABCD Study data. *Poster, FLUX Congress 2021*, 2021.

15. **Richie-Halford A**, Yeatman J, Simon N, Rokem A. Multidimensional analysis and detection of informative features in diffusion MRI measurements of human white matter. *Interactive talk, Neuromatch 2020*, 2020.
16. **Richie-Halford A**, Yeatman J, Simon N, Rokem A. Multidimensional analysis and detection of informative features in diffusion MRI. *Poster, OHBM 2019, Rome*, 2019.
17. **Richie-Halford A**, Yeatman J, Rokem A, Keshavan A. DMRIprep: a Robust, Scalable Preprocessing Pipeline for diffusion MRI. *Software demo & poster, OHBM 2019, Rome*, 2019.

SERVICE

2021–2022 Organization for Human Brain Mapping Conference Abstract Reviewer

2020–2022 ABCD-ReproNim Teaching Assistant

Teaching assistant for remote course facilitating reproducible analysis of the largest long-term study of brain development and child health in the United States.

2021 Manuscript reviewer for Human Brain Mapping

2016–present Software/Data Carpentry Instructor and Instructor Trainer

Carpentries Instructors are volunteers who teach researchers foundational computational and data skills. Volunteered as a Software Carpentry Instructor since 2016 and as an instructor trainer since 2020.

2015–2018 UW Research Computing Club, Seattle, WA

Founding officer/president of student high-performance computing org with $1M+ computing resources. Member of UW Hyak Governance Board.

2016–2019 Rock and Alpine Advisor, Cascade Leadership Challenge, Seattle, WA

Co-led climbing expeditions on Mts. Hood, Baker, and St. Helens for youth outdoor leadership program.

AWARDS

2022 Amazon Cloud Credits for Research

Awarded $20,000 for research connecting white matter development to pediatric mental health.

2021 OHBM Merit Award

Merit award for top rated abstract at OHBM annual meeting.

2021 ISMRM Magna Cum Laude Merit Award

Merit award for outstanding presentation at ISMRM/SMRT annual meeting.

2021 eScience Institute Research Grant

Competitive funding for research advancing data-intensive discovery.

2020 UW Data Science Postdoctoral Fellowship

2013–2017 Department of Energy Computational Science Graduate Fellowship

2016 Amazon Cloud Credits for Research

Awarded $20,000 from AWS to study quasiparticle properties of neutron matter.

2013 Ford Foundation Predoctoral Fellowship (awarded)