Adam Richie-Halford

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Education

2013 – 2020	◇	**Ph.D. Physics, University of Washington, Seattle, WA** Thesis title: *Quantum Monte Carlo Studies of the BCS-BEC crossover*.
2008 – 2010	◇	**M.S. Physics, California State University, Long Beach, CA** Thesis title: *Numerical modeling of the singlet proximity effect in a superconductor-ferromagnet trilayer*. *Graduate Dean's List*—Top 1% of College of Natural Sciences
2001 – 2006	◇	**B.S. Engineering Physics, Embry-Riddle Aeronautical University, Daytona Beach, FL** *Summa Cum Laude*, Minor in Mathematics

Employment History

2023 – pres	◇	**Research Scientist** Developmental-Behavioral Pediatrics, Stanford University, Stanford, CA · Led and managed a cross-functional team of software engineers to scale the an educational assessment platform from inception to 8,000 monthly active users. · Defined and executed the technical roadmap for the platform, including systems architecture, feature development, and data security enhancements. · Developed and oversaw the technology budget to ensure alignment with strategic priorities. · Consulting data scientist and research software engineer
2022 – 2023	◇	**Postdoctoral Scholar** Developmental-Behavioral Pediatrics, Stanford University, Stanford, CA · Developing browser-based assessments for the deep phenotyping of dyslexia · Investigating white matter developmental trajectories associated with preterm birth · Support lab scientists in data science and research software engineering
2020 – 2022	◇	**UW Data Science Postdoctoral Fellow** eScience Institute, University of Washington, Seattle, WA · 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** Department of Physics, University of Washington, Seattle, WA · 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.
2007 – 2010	◇	**Graduate Research Assistant** Department of Physics and Astronomy, CSULB, Long Beach, CA · Developed numerical routines to find supercurrent in magnetic multilayers.
2008 – 2009	◇	**Visiting Scientist** Communications Ground Systems, NASA Jet Propulsion Laboratory, 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.
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. Bhat, K. G., Mogan, A. D., Saavedra, A., Fuentes-Jimenez, M., Siebert, J. M., Ma, W. A., Townley-Flores, C., **Richie-Halford, A.**, Consortium, T. R. D., Wilkey, E. D., & et al. (2024, August). Shared and unique influences of phonological processing on reading and math. `https://doi.org/10.31219/osf.io/em3bg`

2. Kruper, J., **Richie-Halford, A.**, Benson, N. C., Caffarra, S., Owen, J., Wu, Y., Egan, C., Lee, A. Y., Lee, C. S., Yeatman, J. D., Rokem, A., Allen, N., Aslam, T., Atan, D., Balaskas, K., Barman, S., Barrett, J., Bishop, P., Black, G., … Consortium, V. (2024). Convolutional neural network-based classification of glaucoma using optic radiation tissue properties. *Communications Medicine*, *4*, 72. `https://doi.org/10.1038/s43856-024-00496-w`

3. Ramamurthy, M., Kanopka, K., **Richie-Halford, A.**, Domingue, B., Pei, F., Bell, P., Yan, L., Hartsough, A., Gorno-Tempini, M. L., & Yeatman, J. D. (2024, February). Design and validation of a rapid visual processing measure for screening reading difficulties in early childhood. `https://doi.org/10.31234/osf.io/x6ysc`

4. Caffarra, S., Karipidis, I. I., Kruper, J., Kubota, E., **Richie-Halford, A.**, Takada, M., Rokem, A., & Yeatman, J. D. (2024). Assessing white matter plasticity in a randomized controlled trial of early literacy training in preschoolers. *bioRxiv*. `https://doi.org/10.1101/2024.08.16.608210`

5. Roy, E., Van Rinsveld, A., Nedelec, P., **Richie-Halford, A.**, Rauschecker, A. M., Sugrue, L. P., Rokem, A., McCandliss, B. D., & Yeatman, J. D. (2024). Differences in educational opportunity predict white matter development. *Developmental Cognitive Neuroscience*, *67*, 101386. `https://doi.org/https://doi.org/10.1016/j.dcn.2024.101386`

6. Yeatman, J. D., Tran, J. E., Burkhardt, A. K., Ma, W. A., Mitchell, J. L., Yablonski, M., Gijbels, L., Townley-Flores, C., & **Richie-Halford, A.** (2024). Development and validation of a rapid and precise online sentence reading efficiency assessment. *Frontiers in Education*, *9*. `https://doi.org/10.3389/feduc.2024.1494431`

7. Ma, W. A., **Richie-Halford, A.**, Burkhardt, A., Kanopka, K., Chou, C., Domingue, B., & Yeatman, J. D. (2023, September). Roar-cat: Rapid online assessment of reading ability with computerized adaptive testing. `https://doi.org/10.31234/osf.io/7tpx2`

8. Grotheer, M., Bloom, D., Kruper, J., **Richie-Halford, A.**, Zika, S., González, V. A. A., Yeatman, J. D., Grill-Spector, K., & Rokem, A. (2023). Human white matter myelinates faster in utero than ex utero. *Proceedings of the National Academy of Sciences*, *120*(33), e2303491120. `https://doi.org/10.1073/pnas.2303491120`

9. Kruper, J., **Richie-Halford, A.**, Benson, N. C., Caffarra, S., Owen, J., Wu, Y., Lee, A. Y., Lee, C. S., Yeatman, J. D., & Rokem, A. (2023). Specific and non-linear effects of glaucoma on optic radiation tissue properties. *bioRxiv*. `https://doi.org/10.1101/2023.01.17.524459`

10. Rokem, A., Qiao, J., Yeatman, J. D., & **Richie-Halford, A.** (2023). Incremental improvements in tractometry-based brain-age modeling with deep learning. *bioRxiv*. `https://doi.org/10.1101/2023.03.02.530885`

11. Caffarra, S., Kanopka, K., Kruper, J., **Richie-Halford, A.**, Roy, E., Rokem, A., & Yeatman, J. D. (2022). Development of the alpha rhythm is linked to visual white matter pathways and visual detection performance. *bioRxiv*. `https://doi.org/10.1101/2022.09.03.506461`

12. **Richie-Halford, A.**, Cieslak, M., Ai, L., Caffarra, S., Covitz, S., Franco, A. R., Karipidis, I. I., Kruper, J., Milham, M., Avelar-Pereira, B., Roy, E., Sydnor, V. J., Yeatman, J. D., Abbott, N. J., Anderson, J. A. E., Gagana, B., Bleile, M., Bloomfield, P. S., Bottom, V., … Consortium, T. F. C. S. (2022). An analysis-ready and quality controlled resource for pediatric brain white-matter research. *Scientific Data*, *9*(1), 616. `https://doi.org/10.1038/s41597-022-01695-7`

13. Roy, E., **Richie-Halford, A.**, Kruper, J., Narayan, M., Bloom, D., Brown, T. T., Jernigan, T. L., McCandliss, B. D., Rokem, A., & Yeatman, J. D. (2022). White matter and literacy: A dynamic system in flux. *bioRxiv*. `https://doi.org/10.1101/2022.06.21.497048`

14. Kruper, J., Yeatman, J. D., **Richie-Halford, A.**, Bloom, D., Grotheer, M., Caffarra, S., Kiar, G., Karipidis, I. I., Roy, E., Chandio, B. Q., Garyfallidis, E., & Rokem, A. (2021a). Evaluating the reliability of human brain white matter tractometry. *Aperture Neuro*. `https://doi.org/10.1101/2021.02.24.432740`

15. Cieslak, M., Cook, P. A., He, X., Yeh, F.-C., Dhollander, T., Adebimpe, A., Aguirre, G. K., Bassett, D. S., Betzel, R. F., Bourque, J., Cabral, L. M., Davatzikos, C., Detre, J., Earl, E., Elliott, M. A., Fadnavis, S., Fair, D. A., Foran, W.,

Richie-Halford, A., … Satterthwaite, T. D. (2021). QSIPrep: an integrative platform for preprocessing and reconstructing diffusion MRI data. *Nature Methods*. `https://doi.org/10.1038/s41592-021-01185-5`

16. **Richie-Halford**, A., Yeatman, J., Simon, N., & Rokem, A. (2021a). Multidimensional analysis and detection of informative features in human brain white matter. *PLOS Computational Biology*, *17*(6), 1–24. `https://doi.org/10.1371/journal.pcbi.1009136`

17. **Richie-Halford**, A., Narayan, M., Simon, N., Yeatman, J., & Rokem, A. (2021). Groupyr: Sparse Group Lasso in Python. *Journal of Open Source Software*, *6*(58), 3024. `https://doi.org/10.21105/joss.03024`

18. **Richie-Halford**, A., Drut, J. E., & Bulgac, A. (2020). Emergence of a Pseudogap in the BCS-BEC Crossover. *Phys. Rev. Lett.*, *125*, 060403. `https://doi.org/10.1103/PhysRevLett.125.060403`

19. Yeatman, J. D., **Richie-Halford**, A., Smith, J. K., Keshavan, A., & Rokem, A. (2018). A browser-based tool for visualization and analysis of diffusion MRI data. *Nature Communications*, *9*(1), 940. `https://doi.org/10.1038/s41467-018-03297-7`

20. **Richie-Halford**, A., & Rokem, A. (2018). Cloudknot: A Python Library to Run your Existing Code on AWS Batch. In F. Akici, D. Lippa, D. Niederhut & M. Pacer (Eds.), *Proceedings of the 17th Python in Science Conference* (pp. 8–14). `https://doi.org/10.25080/Majora-4af1f417-001`

21. Baker, T. E., **Richie-Halford**, A., & Bill, A. (2016). Classification of magnetic inhomogeneities and $0 - \pi$ transitions in superconducting-magnetic hybrid structures. *Phys. Rev. B*, *94*, 104518. `https://doi.org/10.1103/PhysRevB.94.104518`

22. Harrison, R. J., Beylkin, G., Bischoff, F. A., Calvin, J. A., Fann, G. I., Fosso-Tande, J., Galindo, D., Hammond, J. R., Hartman-Baker, R., Hill, J. C., Jia, J., Kottmann, J. S., Yvonne Ou, M.-J., Pei, J., Ratcliff, L. E., Reuter, M. G., **Richie-Halford**, A., Romero, N. A., Sekino, H., … Yokoi, Y. (2016). Madness: A multiresolution, adaptive numerical environment for scientific simulation. *SIAM Journal on Scientific Computing*, *38*(5), S123–S142. `https://doi.org/10.1137/15M1026171`

23. Baker, T. E., **Richie-Halford**, A., & Bill, A. (2014). Long range triplet Josephson current and $0 - \pi$ transitions in tunable domain walls. *New Journal of Physics*, *16*(9), 093048. `https://doi.org/10.1088/1367-2630/16/9/093048`

24. Baker, T. E., **Richie-Halford**, A., Icreverzi, O. E., & Bill, A. (2014). Cascading proximity effects in rotating magnetizations. *EPL (Europhysics Letters)*, *107*(1), 17001. `https://doi.org/10.1209/0295-5075/107/17001`

25. Bill, A., de Rojas, J., Baker, T. E., & **Richie-Halford**, A. (2012). Properties of Magnetic-Superconducting Proximity Systems. *Journal of Superconductivity and Novel Magnetism*, *25*, 2177–2182. `https://doi.org/10.1007/s10948-012-1659-1`

26. Baker, T. E., Icreverzi, O. E., **Richie-Halford**, A., & Bill, A. (2012). Classical Mechanical Analogies in Wide Dirty SFS Junctions. *Journal of Superconductivity and Novel Magnetism*, *25*, 2183–2185. `https://doi.org/10.1007/s10948-012-1646-6`

27. **Richie-Halford**, A., Iess, L., Tortora, P., Armstrong, J. W., Asmar, S. W., Woo, R., Habbal, S. R., & Morgan, H. (2009). Space-time localization of inner heliospheric plasma turbulence using multiple spacecraft radio links. *Space Weather*, *7*(12). `https://doi.org/10.1029/2009SW000499`

Theses

1. **Richie-Halford**, A. (2020, June). *Quantum Monte Carlo studies of the BCS-BEC crossover* [Doctoral dissertation, University of Washington].

2. **Richie-Halford**, A. (2010). *Numerical modeling of the singlet proximity effect in a superconductor-ferromagnet trilayer* [Master's thesis]. `https://search.proquest.com/docview/860140368?accountid=14784`

Selected Presentations and Posters

1. Grotheer, M., Bloom, D., Kruper, J., Narayan, M., **Richie-Halford**, A., Aguilera González, V., Yeatman, J., Grill-Spector, K., & Rokem, A. (2022). Spatiotemporal differences in preterm infants' bundles are linked to slower ex utero myelination [Poster presentation at OHBM 2022, Glasgow].

2 Kruper, J., Benson, N., **Richie-Halford**, **A.**, Caffarra, S., Owen, J., Wu, Y., Lee, A., Lee, C., Yeatman, J., & Rokem, A. (2022). The optic radiations representing the fovial and peripheral visual fields age differently [Poster presentation at OHBM 2022, Glasgow].

3 **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. (2022). NiRV: the NeuroImaging Report Viewer [Poster presentation at OHBM 2022, Glasgow].

4 Bartley, J., Kent, J., Levitis, E., Moraczewski, D., Rapuano, K., **Richie-Halford**, **A.**, Salo, T., Poline, J.-B., Ghosh, S., Kennedy, D., & Laird, A. (2021). ABCD-ReproNim: A free online course providing training for reproducible analyses of Adolescent Brain Cognitive Development (ABCD) Study data [Poster presentation at FLUX Congress 2021].

5 Bisson, M., Romero, J., Kurth, T., Fatica, M., Damasceno, P. F., Xie, X., **Richie-Halford**, **A.**, Koudoro, S., Garyfallidis, E., & Rokem, A. (2021). GPU-accelerated diffusion MRI tractography in DIPY [Poster Presentation at ISMRM/SMRT Annual Meeting and Exhibition 2021].

6 Joseph, M., Pisner, D., **Richie-Halford**, **A.**, Lerma-Usabiaga, G., Mansour, S., Kent, J., Keshavan, A., Cieslak, M., Dickie, E., Tourbier, S., Voineskos, A., Satterthwaite, T., Poldrack, R., Veraart, J., Rokem, A., & Esteban, O. (2021). dMRIPrep: a robust preprocessing pipeline for diffusion MRI [Poster Presentation at ISMRM/SMRT Annual Meeting and Exhibition 2021].

7 Kruper, J., Yeatman, J., **Richie-Halford**, **A.**, Bloom, D., Grotheer, M., Caffarra, S., Kiar, G., Karipidis, I., Roy, E., & Rokem, A. (2021). Evaluating the reliability of diffusion-MRI based tractometry [Poster Presentation at OHBM Annual Meeting 2021].

8 Kruper, J., Yeatman, J. D., **Richie-Halford**, **A.**, Bloom, D., Grotheer, M., Caffarra, S., Kiar, G., Karipidis, I. I., Roy, E., Chandio, B. Q., Garyfallidis, E., & Rokem, A. (2021b). The test-retest reliability and robustness of diffusion-MRI based tractometry [Poster Presentation at ISMRM/SMRT Annual Meeting and Exhibition 2021].

9 Narayan, M., Simon, N., **Richie-Halford**, **A.**, Rokem, A., & Yeatman, J. (2021). Nonparametric causal analysis of brain and cognition, applied to developmental neuroimaging [Poster Presentation at OHBM Annual Meeting 2021].

10 **Richie-Halford**, **A.**, Cieslak, M., Franco, A. R., Sydnor, V. J., Yeatman, J., Ai, L., Milham, M., Satterthwaite, T. D., & Rokem, A. (2021). A Preprocessed Open Diffusion Derivatives Dataset from the Healthy Brain Network [Poster Presentation at OHBM Annual Meeting 2021].

11 **Richie-Halford**, **A.**, Yeatman, J., Simon, N., & Rokem, A. (2021b). Multidimensional analysis and detection of informative features in human brain white matter [Poster Presentation at ISMRM/SMRT Annual Meeting and Exhibition 2021].

12 **Richie-Halford**, **A.**, Yeatman, J., Simon, N., & Rokem, A. (2021c). Multidimensional analysis and detection of informative features in human white matter [Invited talk at Neural Computation and Engineering Connection 2021].

13 **Richie-Halford**, **A.**, Yeatman, J., Simon, N., & Rokem, A. (2021d). Relating brain connections to behavior in the era of brain observatories [Presentation at eScience Institute Postdoc Seminar 2021].

14 Roy, E., **Richie-Halford**, **A.**, Narayan, M., Kruper, J., Rokem, A., & Yeatman, J. (2021). White matter networks predict development of reading and math abilities [Poster Presentation at OHBM Annual Meeting 2021].

15 **Richie-Halford**, **A.**, Yeatman, J., Simon, N., & Rokem, A. (2020). Multidimensional analysis and detection of informative features in diffusion MRI measurements of human white matter [Interactive talk at Neuromatch 2020 conference].

16 **Richie-Halford**, **A.**, Yeatman, J., Rokem, A., & Keshavan, A. (2019). DMRIprep: a Robust, Scalable Preprocessing Pipeline for diffusion MRI [Software demonstration and poster presentation at OHBM 2019, Rome].

17 **Richie-Halford**, **A.**, Yeatman, J., Simon, N., & Rokem, A. (2019). Multidimensional analysis and detection of informative features in diffusion MRI [Poster presentation at OHBM 2019, Rome].

Service

2021 – 2022   ◇ **Organization for Human Brain Mapping Conference Abstract Reviewer**

Service (continued)

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 – pres	◇ **Software/Data Carpentry Instructor and Instructor Trainer** · Carpentries Instructors are volunteers who teach researchers foundational computational and data skills. · I have 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.
	◇ **ISMRM Magna Cum Laude Merit Award**, merit award for outstanding presentation at ISMRM/SMRT annual meeting.
	◇ **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** (accepted)
2016	◇ **Amazon Cloud Credits for Research**, awarded $20,000 from AWS to study quasiparticle properties of neutron matter.
2013	◇ **Ford Foundation Predoctoral Fellowship** (awarded)