

Exponent®
Engineering & Scientific Consulting

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Professional Profile

Dr. Jeff Swaney assists clients with building data-driven applications to draw actionable insights from their data assets. This broad domain encompasses many facets of the data science lifecycle, from engineering scalable data architectures to designing and implementing machine learning models in production systems.

Within this field, Dr. Swaney specializes in engineering cloud solutions (including both managed and unmanaged services), developing mobile applications, and performing Monte Carlo simulations. Drawing from skills originally developed within the field of astroparticle physics, he now works across various commercial and government sectors, including applications with privacy as an essential concern.

Dr. Swaney received his Ph.D. in Physics from the University of California – Irvine in 2021. His doctoral research explored a novel strategy for studying ultra-high-energy cosmic rays (UHECRs) through the pre-existing global network of smartphone devices. He developed an Android application to detect the constituents of cosmic ray showers passing through smartphone cameras, as well as a cloud-based backend which monitors and improves data quality from individual devices, while assuring privacy for the camera data collected. Through a combination of controlled experiments and Monte Carlo physics simulations, Dr. Swaney studied the sensitivity of CMOS image sensors in smartphones to ionizing radiation, demonstrating the feasibility of such an unconventional cosmic ray observatory.

Academic Credentials & Professional Honors

Ph.D., Physics, University of California, Irvine, 2021

B.A., Physics and Mathematics, Vanderbilt University, 2014

Chancellor's Fellowship, University of California – Irvine, 2014

Underwood Memorial Award, Vanderbilt University, 2014

Phi Beta Kappa (Junior Inductee), Vanderbilt University, 2013

McMinn Scholarship in the Natural Sciences, Vanderbilt University, 2012

Ernest A. Jones Scholarship, Vanderbilt University, 2012

Publications

Dore DD, Kyle M, Burns D, Murray CR, Watson H, Swaney J, Spevack S, Leonhard M, Simon M, Moynihan E, Lapane KL, Wang SV, Longo CL, Ritchey ME. Cardiovascular safety of fixed-dose

extended-release naltrexone/bupropion in clinical practice. Obesity Pillars. 2025;100169. ISSN 2667-3681. https://doi.org/10.1016/j.obpill.2025.100169.

J. Swaney, C. Shimmin, and D. Whiteson, Data Acquisition System for a Distributed Smartphone Cosmic Ray Observatory. (2021). arXiv:2108.04803 [astro-ph.IM]

J. Swaney, M. Mulhearn, C. Pratt, and D. Whiteson. Measurement of Smartphone Efficiency to Cosmic Ray Muons. (2021). arXiv:2107.06332 [astro-ph.IM]

J. Swaney and R.J. Scherrer, The Quadratic Approximation for Quintessence with Arbitrary Initial Conditions. Phys. Rev. D91, 123525. (2015). arXiv:1406.6026 [astro-ph.CO]