# Brandon**Stevenson**

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Quantitatively trained physicist pursuing a Ph.D. in Physics (expected 2026) with a strong foundation in advanced statistical methods, machine learning, and high-fidelity simulations. Holds a B.S. in Physics from the University of Texas at Dallas and has completed rigorous graduate-level coursework in high-energy physics. Experienced in applying computational and data-driven techniques to complex, large-scale problems, with strong programming and analytical skills suited for data science, AI, and quantitative research roles.

## EDUCATION

**Southern Methodist University** | *Ph.D. in Physics* **2019 - 2026**

**University of Texas: Dallas** | *B.S. in Physics* **2012 - 2016**

## SELECTED RESEARCH EXPERIENCE

**Applied Machine Learning Research** | *Ph.D. Research at SMU* **2019 - Present**

Designing and training deep learning models (CNNs, Transformers, VAEs) on high-dimensional physics data including cosmic microwave background and particle collision simulations, advancing both fundamental physics understanding and ML methodology.

Tech: Python, PyTorch, TensorFlow/Keras, scikit-learn, optuna, NumPy/SciPy, CAMB, Pixell, Cython, Fortran

Published peer-reviewed research applying statistical methods to cosmology data

**Primoridal Non-Gaussianity in the CMB** | *Prof. Joel Meyers* **2023 - 2026**

Investigating the presence of primordial non-Gaussianity in the cosmic microwave background using advanced statistical techniques and machine learning models to extract subtle signals from high-dimensional data.

Tech: Python, TensorFlow/Keras, Cython, CAMB, Pixell, LensPyx, HealPy, NumPy/SciPy, Matplotlib

**Gluon Saturation** | *Prof. Fred Olness* **2024 - 2026**

Analyzing deep inelastic scattering data to study gluon saturation effects at small Bjorken-x using machine learning techniques to improve parton distribution function extractions.

Tech: Python, xFitter, TensorFlow/Keras, NumPy/SciPy, Matplotlib

## PROFESSIONAL EXPERIENCE

**L3 Technologies** | *Big Data Engineer II* **2017 - 2019**

Designed and deployed machine learning algorithms for large-scale data systems processing high-throughput streaming data, optimizing model inference for production environments.

Developed solutions for mission-critical problems including [INSERT: model accuracy improvement, latency reduction, throughput metrics].

Built and maintained distributed microservices architecture using Scala and Java across containerized infrastructure.

Collaborated with cross-functional teams to translate research into production-grade systems.

## SKILLS

**Production ML** PyTorch, TensorFlow/Keras, scikit-learn, XGBoost, LightGBM, optuna, model deployment, inference optimization

**Programming Languages** Python (expert), Scala, Java, C/C++, JavaScript, R, MATLAB, Mathematica, Fortran

**Data Science / ML Methods** Deep learning (CNNs, Transformers, VAEs), statistical inference, Monte Carlo methods, distributed computing, Bayesian analysis

**Scientific Computing** NumPy/SciPy, Cython, CAMB, pixell, healpix, Cobaya, CLASS, HealPy

**Physics Tools** xFitter, ROOT, MadGraph, Pythia, Geant4

**Soft Skills** Technical leadership, cross-functional collaboration, mentoring, scientific writing, rapid prototyping

## SELECTED PAPERS

**Beyond Fisher forecasting for cosmology** | *Phys. Rev. D 107, 103506* **2023**

Conducted an analysis of Big Bang Nucleosynthesis simulations by employing advanced statistical methods to identify deviations from Gaussian priors.

Employed the DALI method for quantifying the breakdown of these priors and systematically assessed instances where this approach outperforms, and under performs, conventional Fisher methods.

## SELECTED AWARDS

**Rising Star Award** | *$10,000* | *L3 Technologies* **2018**