D. Hudson Smith | curriculum vitae

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Appointments

Clemson University, Holcombe Dept. of ECE — **Clemson, SC**
Joint Appointment: Research Assistant Professor — *Oct. 2019-Present*

Clemson University, Watt Family Innovation Center — **Clemson, SC**
Research Associate — *Mar. 2018-Present*

- Created the Watt AI applied artificial intelligence research and education program
- Instructed 82 undergraduate students across 22 academic majors in applied artificial intelligence
- Incubated 20 distinct research projects in collaboration with Clemson University faculty
- Co-authored 6 peer-reviewed academic papers in applied machine learning
- Supported more than 30 grant proposal submissions.

Dynamit Technologies, LLC. — **Columbus, OH**
Data Scientist — *Dec. 2016-Mar. 2018*

- Used predictive modeling to optimize millions of dollars in ad spend for Fortune 500 company
- Managed a complex data pipeline involving cloud infrastructure and disparate data sources
- Created and delivered summary reports for internal and client stakeholders

Education

Ohio State University — **Columbus, OH**
PhD in Physics, GPA: 3.9/4.0 — *2011-2016*

- Research: theoretical atomic and high-energy physics, computer simulation of quantum systems
- Thesis: Inducing Resonant Interactions in Ultracold Atoms with an Oscillating Magnetic Field
- Advisor: Dr. Eric Braaten, `braaten.1@osu.edu`

Erskine College — **Due West, SC**
BS in Physics, BA in Mathematics, GPA: 3.9/4.0 — *2007-2011*

Peer reviewed publications

Machine learning

Taye, Mesfin, Dustin Morrow, John Cull, Dane Hudson Smith, and Martin Hagan (2022). "Deep Learning for FAST Quality Assessment." In: *Journal of Ultrasound in Medicine*.

Woo, MinJae, Prabodh Mishra, Ju Lin, Snigdhaswin Kar, Nicholas Deas, Caleb Linduff, Sufeng Niu, Yuzhe Yang, Jerome McClendon, D Hudson Smith, et al. (2021). "Complete and Resilient Documentation for Operational Medical Environments Leveraging Mobile Hands-free Technology in a Systems Approach: Experimental Study." In: *JMIR mHealth and uHealth* 9.10, e32301.

Ehrett, Carl, Darren L. Linvill, Hudson Smith, Patrick L. Warren, Leya Bellamy, Marianna Moawad, Olivia Moran, and Monica Moody (June 2021). "Inauthentic Newsfeeds and Agenda Setting

in a Coordinated Inauthentic Information Operation." In: *Social Science Computer Review*. DOI: 10.1177/08944393211019951.

Mayes, Emma, John Paul Lineberger, Michelle Mayer, Andrew Sanborn, Hudson Smith, and Erica Walker (2021). "Automated Brand Color Accuracy for Realtime Video." In: *SMPTE Motion Imaging Journal* 130.3, pp. 45–49. DOI: 10.5594/JMI.2021.3058397.

Freeman, Daniel, Shaurya Gupta, D. Hudson Smith, Joe Mari Maja, James Robbins, James S. Owen, Jose M. Peña, and Ana I. de Castro (Nov. 2019). "Watson on the Farm: Using Cloud-Based Artificial Intelligence to Identify Early Indicators of Water Stress." In: *Remote Sensing* 11.22, p. 2645. DOI: 10.3390/rs11222645.

Smith, D. Hudson and Artem G. Volosniev (2019). "Engineering momentum profiles of cold-atom beams." In: *Physical Review A* 100.3, p. 033604.

Physics

Smith, D Hudson (2015). "Inducing Resonant Interactions in Ultracold Atoms with a Modulated Magnetic Field." In: *Physical review letters* 115.19, p. 193002.

Volosniev, A. and D. H. Smith (2018). "Impenetrability in Floquet Scattering in One Dimension." In: *Few-Body Systems* 59, pp. 1–9.

Langmack, Christian, D Hudson Smith, and Eric Braaten (2015). "Association of atoms into universal dimers using an oscillating magnetic field." In: *Physical review letters* 114.10, p. 103002.

Braaten, Eric, Christian Langmack, and D Hudson Smith (2014a). "Born-Oppenheimer approximation for the X Y Z mesons." In: *Physical Review D* 90.1, p. 014044.

– (2014b). "Selection Rules for Hadronic Transitions of X Y Z Mesons." In: *Physical review letters* 112.22, p. 222001.

Smith, D Hudson, Eric Braaten, Daekyoung Kang, and Lucas Platter (2014). "Two-body and three-body contacts for identical bosons near unitarity." In: *Physical review letters* 112.11, p. 110402.

Langmack, Christian, D Hudson Smith, and Eric Braaten (2013a). "Atom Loss Resonances in a Bose-Einstein Condensate." In: *Physical review letters* 111.2, p. 023003.

– (2013b). "Avalanche mechanism for the enhanced loss of ultracold atoms." In: *Physical Review A* 87.2, p. 023620.

– (2012). "Avalanche mechanism for atom loss near an atom-dimer Efimov resonance." In: *Physical Review A* 86.2, p. 022718.

Conference Papers and Presentations

Machine learning

Smith, D. Hudson (2021). "SMRF: a Cloud-Based Social Media Research Framework." In: *Research Running on Cloud Compute & Emerging Technologies*. Vol. 2021, pp. 11–12.

Walker, Erica Black, Dane Hudson Smith, John Paul Lineberger, Michelle Leigh Mayer, Emma Elizabeth Mayes, and Andrew Thomas Sanborn (2020). "67-3: ColorNet: A Neural Network-Based System for Consistent Display of Brand Colors for Video." In: *SID Symposium Digest of Technical Papers*. Vol. 51. 1. Wiley Online Library, pp. 1001–1004.

Fine, Jeffrey, Nicholas Deas, Jacob Shellnut Spencer Sargent, and D. Hudson Smith (2019). "Content Analyzing Political Tweets using Natural Language Processing: Opportunities and Challenges." In: *Southern Political Science Association Conference*.

Zhang, Tianyi, Monica Moody, Julia P Nelon, D Matthew Boyer, D Hudson Smith, and Ryan D Visser (2019). "Using Natural Language Processing to Accelerate Deep Analysis of Open-Ended Survey Data." In: *2019 SoutheastCon*. IEEE, pp. 1–3.

Physics

Mohapatra, Abhishek, D Hudson Smith, and Eric Braaten (2016). "Dissociation of Cooper pairs in the BCS Limit using an Oscillating Magnetic Field." In: *APS Division of Atomic, Molecular and Optical Physics Meeting Abstracts*.

Smith, D Hudson (2016). "Induced two-body scattering resonances from a square-well potential with oscillating depth." In: *EPJ Web of Conferences*. Vol. 113. EDP Sciences, p. 02005.

Braaten, Eric, Abhishek Mohaptra, and D Hudson Smith (2016). "Initial Atom Loss Rate after the Sudden Ramp of a BEC to Unitarity." In: *APS Division of Atomic, Molecular and Optical Physics Meeting Abstracts*.

Smith, D Hudson (2015). "Inducing Resonant Interactions in Ultracold Atoms with an Oscillating Magnetic Field." In: *APS Division of Atomic, Molecular and Optical Physics Meeting Abstracts*. Vol. 1, p. 3010.

Smith, D, Christian Langmack, Eric Braaten, et al. (2013). "Avalanche Mechanism for the Enhanced Loss of Ultracold Atoms." In: *APS Division of Atomic, Molecular and Optical Physics Meeting Abstracts*. Vol. 1, 5007P.

Braaten, Eric and Dane Smith (2012). "Avalanche Mechanism for Multiple Atom Loss near an Efimov Atom-Dimer Resonance." In: *APS Division of Atomic, Molecular and Optical Physics Meeting Abstracts*.

Selected research awards

1/2022: Clemson-MUSC Artificial Intelligence Hub *$5k*
(Fellow) Artificial Intelligence Advocate
7/2021: RHBSSI Seed Grant (Clemson University) *$45k*
(Co-PI) ColorNet: Developing AI-based color correction tools for sports media applications
6/2021: ACRE Competitive Grants Program (SCDA) *$120k*
(PI) AI Master Gardener for Greenhouse Supervision
4/2021: Prisma Health Seed Grant *$20k*
(Sen. Colab.) Automated Quality Assessment of FAST Exams
2/2021: ACRE Competitive Grants Program (SCDA) *$20k*
(Co-PI) AI for Fruit and Vegetable Harvesting in South Carolina
2/2021: CU Seed Grant, Tier 1 (Clemson University) *$5k*
(Co-PI) ColorNet: An AI-based color management system for live video
11/2019: CURF Tech Maturation Fund (Clemson) *$29k*
(Co-PI) ColorNet: Consistent display of Clemson brand colors using artificial intelligence
8/2019: Erwin Center for Brand Communications (Clemson University) *$8k*
(Co-PI) AI for on the fly color correction of sports footage
7/2018: ACRE Competitive Grants Program (SCDA) *$105k*

(Co-PI) Rapid Chicken Sex Determination with Multiple Mechanisms and AI

Teaching Experience

Clemson University

Spring 2018–present: Instructor for Watt AI Creative Inquiry course for 9 consecutive semesters

Spring 2020–Fall 2021: Designed intro to artificial intelligence curriculum for undergraduates from diverse majors

Fall 2021–present: Led weekly journal club with advanced students

Fall 2018–Spring 2019: Instructor for Ulbrich CI focused on manufacturing analytics

Ohio State University

Fall 2015: Tutor for graduate level classical mechanics course

Fall 2012–Spring 2013: Recitation and lab instructor for Physics: Vibrations, Fluids, Thermodynamics, and Special Relativity

Erskine College

Spring 2010: Lab instructor for Modern Physics

Fall 2009: Teaching assistant for Calculus

Fall 2008–Fall 2009: Teaching assistant for Introductory Physics

Fall 2008–Fall 2010: Writing assistant for various subjects

Computational tools

- Python, R, SQL, bash, C++, C#, Java, LaTeX
- Deep Learning and Probabilistic Programming: Pytorch, Pyro, NumPyro, Jax
- Experience with Cloud and cluster computing environments
- Hardware-accelerated array programming for scientific computing

Honors and Awards

2016: Presidential Fellow, OSU

2013: Winner of Physics Dept. Poster Competition, OSU

2011: Fowler Fellow, OSU

2011: University Fellow, OSU

2010: T. Kincannon Mathematics Award, Erskine College

2010: Junkin Physics Award, Erskine College

2008: Garnet Circle Award, Erskine College

2007: Roy M. Smith Mathematics Scholarship, Erskine College