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**
Data Scientist — *Mar. 2018-Present*

- Co-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
- Supported a total of 24 internal and external grant proposals (11 funded, 2 pending to date)

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*

Research Grants

7/2021: RHBSSI Seed Grant (Clemson University) — *$45k*
ColorNet: Developing AI-based color correction tools for sports media applications

6/2021: ACRE Competitive Grants Program (SCDA) — *$120k*
AI Master Gardener for Greenhouse Supervision

4/2021: Prisma Health Seed Grant — *$20k*
Automated Quality Assessment of FAST Exams

2/2021: ACRE Competitive Grants Program (SCDA) — *$20k*
AI for Fruit and Vegetable Harvesting in South Carolina

2/2021: CU Seed Grant, Tier 1 (Clemson University) — *$5k*
ColorNet: An AI-based color management system for live video

2/2021: CU Seed Grant, Tier 2 (Clemson University) *$10k*

Integrating Dispersed Big Data into a Single Smart Water and Infra. Mgmt. System

11/2019: CURF Tech Maturation Fund (Clemson) *$29k*

ColorNet: Consistent display of Clemson brand colors using artificial intelligence

8/2019: Erwin Center for Brand Communications (Clemson University) *$8k*

AI for on the fly color correction of sports footage

7/2018: ACRE Competitive Grants Program (SCDA) *$105k*

Rapid Chicken Sex Determination with Multiple Mechanisms and AI

Peer reviewed publications

Applied machine learning

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.

Woo, MinJae, Prabodh Mishra, Ju Lin, Snigdhaswin Kar, Nicholas Deas, Caleb Linduff, Sufeng Niu, Yuzhe Yang, Jerome McClendon, D. Hudson Smith, Stephen L. Shelton, Christopher E. Gainey, William C. Gerard, Melissa C. Smith, Sarah F. Griffin, Ronald W. Gimbel, and Kuang-Ching Wang (2021). "Complete and Resilient Documentation (CARD) for Operational Medical Environments Leveraging Mobile Hands-free Technology in a Systems Approach." In: *JMIR mHealth and uHealth* (*in press*).

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

Applied 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*.

Teaching Experience

Clemson University

Spring 2018–present: Instructor for Watt AI Creative Inquiry course for 8 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
- The Pytorch deep learning framework
- 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