Scott H. Hawley's C.V. (Boyer Model Edition)

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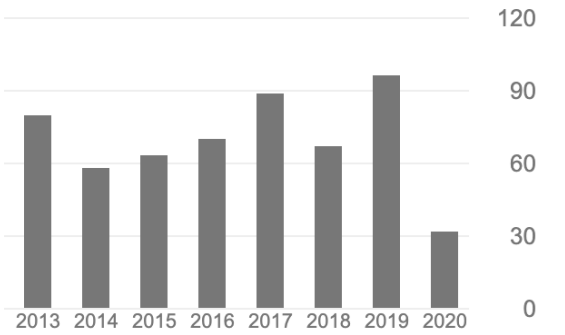
Birthdate: Oct. 18, 1972
Birthplace: Hong Kong, B.C.C.
Citizenship: U.S.A.
Languages: English, German.

Recent Citation History (via Google Scholar):

	All	Since 2015
Citations	1634	418
h-index	9	8
i10-index	8	6



Education

- Ph.D. in Physics. University of Texas at Austin (UT-Austin), August 2000.
  Supervisor: Matthew W. Choptuik.
  Dissertation: "Scalar Analogues of Compact Astrophysical Systems."
- B.S. with Honors in Physics. College of William & Mary, Williamsburg, VA, May 1994.

Employment

- Professor of Physics, Belmont University, August 2019 to present.
- Associate Professor of Physics, Belmont University. August 2013 to 2019.
- Assistant Professor of Physics, Belmont University. August 2006 to 2013.
- Postdoctoral Research Assistant. Center for Relativity, Department of Physics, UT-Austin. October 2002 to July 2006.
- Postdoctoral Fellow. Numerical Relativity Group, Astrophysical Relativity Division, Max-Planck-Institut für Gravitationsphysik / Albert Einstein Institute (AEI), Golm, Germany. October 2000 to 2002.
- Graduate Research Assistant. Center for Relativity, Department of Physics, UT-Austin. Summer 1997, Summer 1998 to Summer 2000.
- Teaching Assistant. Department of Physics, UT-Austin. Fall 1995, Spring 1996, Fall 1996 to Spring 1998.
- Astrophysicist. Solar-Terrestrial Relationships Branch, Space Sciences Division, Naval Research Laboratory, Washington, DC. April 1995 to August 1995, Summer 1996.
- Physicist. Contracted to Army Research Laboratory, Ft. Belvoir, VA by Telectronics Inc. June 1994 to Mar. 1995.

1 Scholarship of Discovery

Peer-Reviewed Publications

- "Profiling Audio Compressors with Deep Neural Networks," S.H. Hawley, B. Colburn and S.I. Mimilakis, Full paper for 147th Audio Engineering Society (AES) Conference (2019). Demo page: http://www.signaltrain.ml
  - **Comment:** This was a significant piece of work, being the first to successfully solve this "hard" and "desirable" problem; the result of 3 years' collaboration with S.I. Mimilakis (of Fraunhofer Institute for Digital Media Technology & Adobe) – who I met on a Study Abroad trip in 2016!
- "Spin Dependence in Computational Black-Hole Data," S.H. Hawley, R.A. Matzner and M. Vitalo. *General Relaivity and Quantum Cosmology E-print Archive*, gr-qc/0604100 (2006).
- "Dynamical evolution of quasi-circular binary black hole data," M. Alcubierre, B. Brueg-mann, P. Diener, F.S. Guzman, I. Hawke, S.H. Hawley, F. Herrmann, M. Koppitz, D. Pollney, E. Seidel, and J. Thornburg. *Phys. Rev.* **D72**:044004 (2005).
- "Evolutions in 3D Numerical Relativity Using Fixed Mesh Refinement," E. Schetter, S.H. Hawley and I. Hawke. *Class. Quant. Grav.***21**:1465-1488 (2004).
- "Tips for Implementing Multigrid Methods on Domains Containing Holes," S.H. Hawley and R. A. Matzner. *Class. Quant. Grav.***21**:805-822 (2004).
- "Towards Standard Testbeds for Numerical Relativity," M. Alcubierre, G. Allen, T. W. Baumgarte, C. Bona, D. Fiske, T. Goodale, F. S. Guzmán, I. Hawke, S.H. Hawley, S. Husa, M. Koppitz, C. Lechner, D. Pollney, D. Rideout, M. Salgado, E. Schnetter, E. Seidel, H.-A. Shinkai, D. Shoemaker, B. Szilágyi, R. Takahashi and J. Winicour. *Class. Quant. Grav.***21**:589-613 (2004).
- "Numerical Evidence for 'Multi-Scalar Stars'," S.H. Hawley and M.W. Choptuik. *Phys. Rev.* **D67**:024010 (2003).
- "Boson Stars Driven to the Brink of Black Hole Formation," S.H. Hawley and M.W. Choptuik. *Phys. Rev.* **D62**:104024 (2000).
- "The Green Line Corona and Its Relation to the Photospheric Magnetic Field," Y.-M. Wang, N.R. Sheeley, Jr., S.H. Hawley, J.R. Kraemer, G.E. Brueckner, R.A. Howard, C.M. Korendyke, D.J. Michels, N.E. Moulton, D.G. Socker and R. Schwenn, *Astrophys-ical Journal* **485**:419-429 (1997).
- "Measurements of Flow Speeds in the Corona Between 2 and 30 R," N.R. Sheeley, Jr., Y.-M. Wang, S.H. Hawley, G.E. Brueckner, K.P. Dere, R. A. Howard, M. J. Koomen, C. M. Korendyke, D.J. Michels, S.E. Paswaters, D.G. Socker, O.C. St. Cyr, D. Wang, P.L. Lamy, A. Llebaria, R. Schwenn, G.M. Simnett, S. Plunkett and D.A. Biesecker, *Astrophysical Journal* **484**:472-478 (1997).
- "The Magnetic Nature of Coronal Holes," Y.M. Wang, S.H. Hawley and N.R. Sheeley, Jr. *Science* **271**:464-469 (1996).

Invited Talks

- "SignalTrain: Profiling Audio Compressors with Deep Neural Networks," London Audio Engineering Society, Aug. 2, 2019.

- "The Eve of Gravitational Wave Astronomy," Meeting of Bernard-Seyfert Astronomical Society, Adventure Science Center, Nashville TN, Aug. 15, 2012.
- "Black Holes and Gravity Waves," Tennessee Star Party, a gathering of professional and amateur astronomers, Lynchburg, TN, Sep. 8, 2007.
- "Heavy Duty Astrophysics: Black Holes and Gravity Waves," Meeting of Bernard-Seyfert Astronomical Society, Adventure Science Center, Nashville TN, Jan. 18, 2007.
- "Spin-Spin Effects in Binary Black Hole Systems", New Frontiers in Numerical Relativity Conference, Albert Einstein Institute, Potsdam Germany, July 2006.
- "Spin Interactions in Binary Black Hole Initial Data", Numerical Relativity 2005 Conference, Goddard Space Flight Center, Nov. 4, 2005.
- "Overview of a few General Relativistic Solitons", 4th IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, University of Georgia, Apr. 13, 2005.
- "Gravitating Globs of Multiple Scalar Fields," Third International IMACS conference on "Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory", Athens GA, Apr. 8, 2003.

Awards, Grants, Prizes and Recognition

- "Deep Learning Applications for Musical Acoustics and Audio," S.H. Hawley, R. Muehleisen and A. Morrison, Grant allocation of 5,000 CPU-hours, Argonne National Laboratory, Jan. 17, 2019.
- Director's Discretionary Allocation, Awarded 250,000 CPU-hours, valued at $112,500. National Institute for Computational Sciences, Oak Ridge National Laboratories, Oak Ridge, TN, July 11, 2012.
- Startup Allocation, Awarded 25,000 CPU-hours, valued at $12,500. National Institute for Computational Sciences, Oak Ridge National Laboratories, Oak Ridge, TN, Sep. 15, 2011.

Software Releases / Code Published

- "Avoid CLOP by Removing Unwrap," S.H. Hawley, Pull Request #1610, merged into Tensorflow/Magenta, Oct. 2019.
  - **Comment:** This is my improvement to some of Google's computer code for audio synthesis, offering enhanced numerical accuracy. My improvement was accepted ("merged") and published as part of their Tensorflow repository for neural network computing, used by tends of thousands of developers and researchers worldwide. Thus I can claim the honorific of "Tensorflow Contributor"!
- "SignalTrain" (Learning audio effects with neural networks), S.H. Hawley and S.I. Mimilakis, GitHub.com, Aug. 2019.
- "Panotti" (Neural network multichannel audio classifier), S.H. Hawley, GitHub.com, May 2017, updates through Jan. 2019.

Datasets Curated

- "SignalTrain LA2A Dataset," B. Colburn and S.H. Hawley, *Zenodo.com*, DOI: 10.5281/zenodo.3348083 (2019).

Contributed Talks (Meetings and Conferences)

- "Profiling Musical Audio Processing Effects with Deep Neural Networks," S.H. Hawley, B.L. Colburn and S.I. Mimilakis, 176th Acoustical Society of America conference, Victoria, BC, Nov 6, 2018.
- "Spin-Spin Effects in Binary Black Hole Systems AND Involving Undergraduates in Numerical Relativity Research", American Physical Society April Meeting, Atlanta GA, Apr. 2, 2012.
- "Spin-Spin Effects in Models of Binary Black Hole Systems," S.H. Hawley, Tennessee Academy of Science Annual Meeting, Cookeville TN, Nov 10, 2010.
- "Study of Spin-Spin Interaction in Binary Black Hole Initial Data," S.H. Hawley, 3rd Gulf Coast Gravity Meeting, Mar. 23, University of Alabama at Huntsville, Mar. 23 2007.
- "4 Tips for Implementing Multigrid Methods on Domains with Holes" S.H. Hawley and R.A. Matzner, American Physical Society meeting, Apr. 2003.
- "Evolving Black Holes with Mesh Refinement," Caltech TAPIR seminar, Apr. 18, 2003.
- "Update on Using FMR/AMR for GR", S.H. Hawley, Workshop on Formulations of Einstein Equations for Numerical Relativity Mexico City-UNAM, May 21, 2002.
- "Progress in Adaptive Mesh Refinement Techniques for Numerical Relativity," S.H. Hawley and M.W Choptuik, Workshop on Numerical Relativity, Krugersdorp, South Africa, July 26, 2001.
- "Multi-Scalar Stars: Families of Relativistic 'Solitons'," S.H. Hawley and M.W Choptuik, at GR16: 16th Conference of the International Society on General Relativity, Durban, South Africa, July 19, 2001.
- "Critical Phenomena Associated with Boson Stars," S.H. Hawley and M.W Choptuik, Proceedings of the 20th Texas Symposium on Relativistic Astrophysics, Dec. 14, 2000
- "Minimal Development of Parallel Adaptive Mesh Refinement Applications," S.H. Hawley and M.W Choptuik, High Performance Parallel Computing Symposium, Applied Research Laboratories, UT-Austin, Dec. 2, 1999.
- "Toward Automatic Parallel Adaptive Mesh Refinement," S.H. Hawley and M.W Choptuik, Meeting of the American Physical Society, Texas Section, Oct. 29, 1999.
- "Toward Automatic Parallel Adaptive Mesh Refinement," S.H. Hawley and M.W Choptuik, High Performance Computing and Cactus Workshop, National Center for Supercomputing Applications (NCSA), University of Illinois at Urbana-Champaign, Oct. 1, 1999.
- "Multi-Scalar Stars and Their Relation to Critical Phenomena of Perturbed Boson Stars," S.H. Hawley and M.W Choptuik, Meeting of the American Physical Society, Texas Section, Oct. 1998.
- "Measurements of Flow Speeds in the Corona Between 2 and 30 R," N.R. Sheeley, Jr., Y.-M. Wang and S.H. Hawley, Meeting of the American Geophysical Union, Fall 1996.

- "Relation Between the Large-Scale Photospheric Field and LASCO/EIT Coronal Structures During 1996," Y.M. Wang, N.R. Sheeley, Jr., S.H. Hawley and J.R. Kraemer, Meeting of the American Geophysical Union, Fall 1996.
- "Changes to the Global Solar Coronal Structure Associated with an Active Region," R. Howard, N.R. Sheeley, S.H. Hawley, J.R. Kraemer, Y.M. Wang, G.E. Brueckner, K.P. Dere, M.J. Koomen, C.M. Korendyke, D.J. Michels, J.D. Moses, D.G. Socker, M.D. Andrews, J.W. Cook, J.S. Morrill, N.E. Moulton, C.M. Korendyke, J.W. Cook, S.E. Paswaters, D. Wang, O.C. St. Cyr, S.E. Paswaters, D. Wang, P.L. Lamy, A.L. Lleberia, M.V. Bout, R. Schwenn, G.M. Simnett, S. Plunkett and D.A. Biesecker, Meeting of the American Geophysical Union, Fall 1996.

Media Appearances

- "The Great American Eclipse," CNN with Wolf Blitzer, Aug. 21, 2017.
- "Eclipse science: Here's what to expect," MSNBC Squawk Box, Aug. 21, 2017.

Public Seminars

- "Celestial Mechanics & Solar Physics," address for Eclipse 2017 event at Belmont University, Aug. 21, 2017.
- "Hearing the Still, Small Voice: STEM+AET Features of Gravitational Wave Detection," College of Sciences & Mathematics Colloquium, Belmont University, Mar. 2, 2016.
- "The Eve of Gravitational Wave Astronomy," hosted by Bernard-Seyfert Astronomical Soceity, Nashville's amateur & professional astronomy club, Aug. 15, 2012.
- "Parallel Adaptive Mesh Studies of Black Hole Spin-Spin Interactions," Center for Computation and Technology, Louisiana State University, May 17, 2012.

Service to Professional Community

- Co-chair (with Bozena Kostek, Gdansk University of Technology) for session on "Machine Learning in Musical Acosutics," Fall 2019 meeting of the Acoustical Society of America, San Diego, CA, Dec. 4, 2019.
- Session chair for Signal Processing at 147th Audio Engineering Society Conference, Oct. 16, 2019.
- Co-chair (with Vasileios Chatziioannou, U. of Vienna) for session on "Musical Acoustics and Signal Processing in Acoustics: Modeling Musical Instruments and Effects," Fall 2018 meeting of the Acoustical Society of America, Victoria, BC, Nov. 6, 2018.

2 Scholarship of Application

Peer-Reviewed Publications

- "Visualizing Sound Directivity via Smartphone Sensors," S.H. Hawley and R.E. McClain Jr., *The Physics Teacher*, **56**:72 (2018).
    - **Comment:** This made the cover of The Physics Teacher! This could be listed under Scholarship of Teaching instead/also: applying some app-writing know-how to develop a new measurement & visualization device to solve an pedagogical problem for teaching math-averse students about sound directivity.

Invited Talks

- "SPNet: Object Detection of Antinode Regions in Oscillating Steelpan Drums," Acoustical Society of America – Special Session on Machine Learning for Musical Acoustics, Dec. 4, 2019.
- "Experiments in 3D Sound Field Visualization," Circuit Benders Ball, Nashville TN, Aug. 26, 2017.
- "Idea to App: 4 Examples," DevFest Nashville, Jan. 28, 2017.

Awards, Grants, Prizes and Recognition

- Winner, Art+Logic Incubator Lab competition, for my submission of a DeepNeural Network audio classifier app prototype to help music composers and producers, July 12, 2018. Valued at $50,000 value of development work. Software product "Vibary" to be released as Open Source, late March 2020.
- Finalist, AI Grant competition AIGrant.org. 95 finalists selected from over 950 applicants. For proposal by S.H. Hawley, T. Baird & F. Baird, "Infrastructure for Community Construction and Moderation of Media Datasets for Human and A.I. Training." Sep. 2017.
- Finalist, AI Grant competition AIGrant.org. 45 finalists selected from over 450 applicants. For proposal by S.H. Hawley, T. Baird & F. Baird, "Free Heart & Lung Sound Dataset, for A.I. and Human Diagnosis Training." May 2017.
- Winner, Les Paul Music Innovation Award. Presented by Gibson, Inc. For S.H. Hawley & J. Dowse, "Machine Learning Applications Poised to Revolutionize the Music Industry." Jan. 2017. (Gibson withdrew from the program)

Software Releases

- "Vibrary: A Consumer-Trainable Music Tagging Utility," S.H. Hawley and Art+Logic, Inc. (pending, late March 2020).
- "Polar Pattern Plotter," (Sound directivity measurement & visualization), S.H. Hawley, iOS App Store, June 2016.

Conference Proceedings

- "Vibrary: A Consumer-Trainable Music Tagging Utility," S.H. Hawley, J. Bagley, B. Porter, and D. Trayham, Engineering Brief for 147th Meeting of the Audio Engineering Society, New York, NY, Oct. 19, 2019.
- "Sound Fields Forever: Mapping sound fields via position-aware smartphones," S.H. Hawley, S. Alegre & B. Yonker, Engineering Brief for 143rd Meeting of the Audio Engineering Society, New York, NY, Oct. 21, 2017.

Contributed Talks (Meetings and Conferences)

- "Because Nobody Wants to Edit Drums: Building Trainable Audio Production Tools via Machine Learning," Music City Data conference (sub-conference of Music City Tech 2018), Vanderbilt University, Nashville TN, June 2, 2018.
- "Crowdsourcing the creation of an audio dataset for human and machine medical diagnosis training," S.H. Hawley, T. Baird and F. Baird, 174th Meeting of the Acoustical Society of America, New Orleans, LA, Dec. 2017.
- "Sound Fields Forever: Mapping 3D Sound Fields Using Position-Aware Smartphone Technology," S.H. Hawley, S. Alegre, and B. Yonker, 174th Meeting of the Acoustical Society of America, New Orleans, LA, Dec. 2017.
- "Visualizing Sound Directivity via Smartphone Sensors," 5th Joint Meeting of the Acoustical Society of America and the Japanese Acoustical Society, Honolulu, HI, Nov 28, 2016.

Non-Peer-Reviewed or Popular-Level Publications

- "Principal Component Analysis (PCA) from Scratch," S.H. Hawley. Tutorial blog post, drscotthawley.github.io, Dec. 21, 2019.
- "Parallelizing Python, Simplified," S.H. Hawley. Tutorial blog post, drscotthawley.github.io, Dec. 16, 2018.
- "Resolving Mac OS X Aliases in Python," S.H. Hawley. Tutorial blog post, drscotthawley.github.io, Dec. 16, 2018.

Public Seminars

- "A New Mobile App for Session Documentation," Belmont Audio Engineering Society, Nov 19 2015.
- "Practical Home Studio Construction in the Nashville Area," Student Section of the Audio Engineering Society, Belmont University, Nov. 18, 2014.
- "Bayesian Analysis for Audio Engineers," Student Section of the Audio Engineering Society, Belmont University, Oct. 10, 2014.
- "Experiments with Machine Learning & Audio," Nashville Music Programmers Meetup, Mar. 27, 2017.
- "Web Audio Basics," Nashville Music Programmers Meetup, Mar. 21, 2016.

Service to Professional Community

- Founder and facilitator of ASPIRE: A Research Co-op, "A loose collective of scientists, engineers, artists and developers who collaborate on bringing their innovative audio ideas to life," @aspirecoop on GitHub and Twitter. Planned and led 18 meetings(/workshops) from Jan. 2017 to present.

3 Scholarship of Integration

Peer-Reviewed Publications

- "Synthesis of Musical Instrument Sounds: Physics-based Modeling or Machine Learning?" S.H. Hawley, V. Chatziioannou and A. Morrison. *Acoustics Today* invited feature article (Spring 2020).
    - **Comment:** This feature article was developed at the request of the editor of the journal, beginning a year in advance.
- "Challenges for an Ontology of Artificial Intelligence," S.H. Hawley, *Perspectives on Science and Christian Faith, special edition on A.I.*, Derek Schuurman, ed., Journal of the American Scientific Affiliation, 71, 2 (2019).

Book Chapters

- "Theopolis Monk: Envisioning a Future of A.I. Public Service," S.H. Hawley, in *The Transhumanism Handbook*, Newton Lee, ed., *Springer Nature* (2019).
    - **Comment:** This 200-reference chapter received favorable, unsolicited promotions from world experts. I will share more during our session.

Invited Talks

- "Classification and its Discontinuities," invited evening address at Wheaton University, Oct. 14, 2019.
- "Envisioning a Future of A.I. Public Servants," Enlightening Talks @ Lila, Belmont University, Mar. 4, 2019. (Downloaded 47 times by users around the world.)
- "Envisioning a Future of A.I. Public Servants," Faith, Technology and the Future conference, Lipscomb University, Nashville TN, Aug. 25, 2018.
- "Challenges for an Ontology of Artificial Intelligence," Computer Science Department, University of Bath, Bath, UK, Aug. 2, 2018.

Awards, Grants, Prizes and Recognition

- Selected for Cohort 2 of Oxford program/grant,"Bridging the Two Cultures of Science and the Humanities II," a grant project run by Scholarship and Christianity in Oxford (SCIO), the UK subsidiary of the Council for Christian Colleges and Universities (CCCU), with funding by Templeton Religion Trust, The Blankemeyer Foundation, and Belmont University. For my project, "Christian Responses to the Ascendancy of Artificial Intelligence." (2017-2019)
    - **Comment:** This was a major grant that involved matching funds from Belmont, hiring of student research assistants, the formation of The Science and Religion Club of Belmont, flying Belmont Senior Leadership to meetings in Oxford and Florida, and myself spending July 2018 and 2019 in Oxford. 30 other Christian universities from the US, Africa, South America and Asia were also involved.

Non-Peer-Reviewed or Popular-Level Publications

- Book review of *The Creativity Code* by Marcus du Sautoy, in *Perspectives on Science and Christian Faith, The Journal of the American Scientific Affiliation*, 72:1, p.52 (2020).
- "A.I. Creeds and Confessions," A. Mourelatos and S.H. Hawley, *AI and Faith Newsletter* (Jan. 2020).
    - **Comment:** This comparative study of 5 different AI Ethics pronouncements was a project I suggested to my "Oxford B2C2" RA student Andrico. Unlike my other RAs on this grant, I wanted to give Andrico his *own* topic which I could mentor him through.
- "Theopolis Monk, Part 1: Envisioning a Future of A.I. Public Service," *SuperPosition-Magazine.com* (Aug. 2018).
- "Theopolis Monk, Part 2: Their Thoughts are Not Our Thoughts," *SuperPosition-Magazine.com* (Sep. 2018).
- "Theopolis Monk, Part 3: The Hypothesis is Probably Wrong," *SuperPositionMagazine.com* (Oct. 2018).
- "Theopolis Monk, Part 4: Servant and Sword," *SuperPositionMagazine.com* (Nov. 2018).
- "Theopolis Monk, Part 5: Further Fertile Fields," *SuperPositionMagazine.com* (Dec. 2018).

Conference Proceedings

- "Fourier Transforms, Audio Engineering, and the Quantum Nature of Reality," S.H. Hawley, Engineering Brief for 135th Meeting of the Audio Engineering Society, New York, NY (2013).
    - **Comment:** This could go under Scholarship of Teaching instead/also; it is about integrating instruction in acoustics with that of quantum mechanics. The talk immediately *after* mine was my first exposure to the use of machine learning for audio production, which spurred my subsequent research trajectory!

Media Appearances

- "Narratives of Artificial Intelligence (with Scott Hawley and John Wyatt)," *The Afterword Podcast*, recorded two episodes on Feb. 24 2020. First episode broadcast date: March 30 (2020).
- "Sacred Space interview with Scott Hawley: Science, Faith and Creativity," `https://www.youtube.com/watch?v=VdV69Xz2Pqk` (2016).
- "Music, Science and Religion," Ben Moody (formerly of band Evanescence) podcast with Scott Hawley and Jason Charles Miller (formerly of band Godhead) (2013).

Service to Professional Community

- Expert panelist for review of "Citizenship in a Networked Age," D. Burbidge and A. Briggs, PI's, Templeton World Charity Foundation, Catholic University, Washington, D.C., Nov. 6, 2019.
- Founding Member and Contributing Editor, AI and Faith, 2019-present.

4 Scholarship of Teaching and Learning

Peer-Reviewed Publications

- "Online music learning: informal, formal and STEAM contexts," C. Johnson and S. Hawley, *International Journal on Innovations in Online Education*, Begel House, July 25 (2017).

Software Releases

- "SHAART Acoustic Tools" (audio analysis suite for PHY2010) v0.6, GitHub.com, Feb. 2016, updates through 2018.
- "Knobility: An App for Audio Session Documentation" (to assist AET3190 students), S.H. Hawley, iOS App Store, Oct. 2015.

Non-Peer-Reviewed or Popular-Level Publications

- "Getting Started in ML-Audio," S.H. Hawley and R. Miller, *GitHub.com,* Dec. 2019-present.
    - **Comment:** Students at conferences would would ask me,"How do I get started doing machine learning and audio?" This page was an attempt by myself and AET grad student Ryan Miller to gather many resources from around the web for pedagogical purposes, crowdsourcing input from established researchers and developers. Our page has received textual contributions from senior machine learning researchers at Google, Facebook, and Adobe!
- "My First NN Part 3. Multi-Layer Networks and Backpropagation," S.H. Hawley. Tutorial blog post, drscotthawley.github.io, Feb. 8, 2019.
    - **Comment:** Posted a 3-part series of lessons from my Spring 2019 course, "Machine Learning & Neural Networks." This third post received 79 retweets and 420 likes on Twitter. Among these was a retweet by star machine learning educator Dr. Jeremy Howard (89.3K followers) of U. San Francisco's CS department, who promoted it saying: "This is a fantastic series for developing a deep understanding of back propagation..."
- "My First Neural Network, Part 2. Bias and CE Loss," S.H. Hawley. Tutorial blog post, drscotthawley.github.io, Feb. 4, 2019.
- "My First Neural Network, Part 1," S.H. Hawley. Tutorial blog post, drscotthawley.github.io, Jan. 30, 2019.
- "Portal Bouncing and Oscillations," *Teach With Portals*, Leslie Redd, editor, Valve Corporation, Publisher. www.teachwithportals.com, July 24, 2012.
- "Simple Harmonic Motion and Hooke's Law," *Teach With Portals*, Leslie Redd, editor, Valve Corporation, Publisher. www.teachwithportals.com, July 24, 2012.
- "Interactive Transistor Amplifier Applet," *MERLOT: Multimedia Educational Resource for Learning and Online Teaching*, www.merlot.org, Aug. 5, 2012.
- "Interactive Simple Harmonic Oscillator Applet," *MERLOT: Multimedia Educational Resource for Learning and Online Teaching*, www.merlot.org, Aug. 5, 2012.

- "Interactive Series RLC Circuit Applet," *MERLOT: Multimedia Educational Resource for Learning and Online Teaching*, www.merlot.org. Aug. 5, 2012.

Public Seminars

- "The Imitation Scam: Faking Online Personalities via A.I. Synthesis of Language, Images, and Video," National Association of Science Teachers (Belmont Chapter), Mar. 1, 2019.
- "Science Teaching & Machine Learning," National Association of Science Teachers (Belmont Chapter), Mar. 15, 2017.
- "Smartphone Apps for Acoustics Education," College of Sciences and Mathematics Research Seminar, Belmont University, Sep. 19, 2016
- "Reflections on the Development of Interactive Learning Tools," Scholarship of Teaching and Learning Symposium, Belmont University, May 11 2016.