Elijah Christensen *PhD*

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Summary

I am a physician-scientist trainee graduating from an NIH-sponsored Medical Scientist Training Program (MSTP). As a trainee with industry software experience and advanced degrees in engineering, medicine and neuroscience I am well-positioned to thrive in the data-driven and multidisciplinary academic clinical environment. Furthermore, my consistent record of independent funding through competitive research scholarships and fellowships echoes confidence in my ability to launch and sustain a productive research program in academic medicine.

My scientific interests are at the intersection of neuroscience, machine learning, and medical devices and have yielded peer-reviewed publications and intellectual property worthy of patent applications. I hope to leverage my unique training and experience to better understand the brain and accelerate innovation in brain-interface technology and their medical applications. I seek to continue my professional development in residency at a program that complements my clinical and scientific aspirations.

Education

University of Colorado - Anschutz Medical Campus — Aurora, CO

Doctor of Medicine — *2014 – 2022*

Doctor of Philosophy • Neuroscience — *2017 – 2020*
Dissertation: "Computational models of neural encoding in vision and neurostimulation"
Advisor: Joel Zylberberg, Ph.D.

University of Washington — Seattle, WA

Bachelors of Science • Bioengineering with Honors — *2008 – 2011*
Thesis: "Rapid prototyping silicon photonics for biosensing applications"
Advisor(s): Daniel Ratner, Ph.D. / Michael Hochberg Ph.D.

Olympic College — Bremerton, WA

Associates of Science (A.S.) — *2007 – 2008*

Experience

Eastern Cooperative Oncology Group — Boston, MA

Software Development Consultant — *May '14 – Dec '14*
Developed software libraries in Ruby for streamlining pathology specimen Extract-Transform-Load (ETL) operations.

Northwestern University — Chicago, IL

Software Developer / Systems Analyst — *Oct '12 – May '14*
Full-stack development web-based tools for tracking and managing pathology specimen workflows.

Transaction Network Services — Seattle, WA

Software Engineer — *Feb '12 – Oct '12*
Developed tools and reporting for simulating large scale (approx. 1M devices) load testing of internal services. Automated workflows for testing Android app UI.

University of Washington — Seattle, WA

Research Scientist — *Jun '11 – Feb '12*
Developing algorithms to identify shockable hearth rhythms for use in Automated External Defibrillators (AED). Embedded circuit design and prototyping of consumer AED's.

Please refer to my Linkedin profile for the complete list of work experiences along with recommendations.

Major Awards

2020 - VISTA Distinguished Visiting Trainee Travel Award Provides travel support for high-caliber trainees doing research that is aligned with the VISTA program to foster interdisciplinary research in biological and computational vision.

2019 - National Defense Science and Engineering Graduate Fellowship Competitive fellowship (6% acceptance rate) awarded to PhD students pursuing important research.

2010 - Mary Gates Research Scholarship: Competitive scholarship for undergraduates engaged in research at the University of Washington, 168 awarded annually.

2010 - Hooked on Photonics Research Scholarship: Competitive scholarship for undergraduates conducting research in photonics, 10 awarded annually.

Publications

AM. Hixon, **E. Christensen**, R. Hamilton, and C. Drees. Epilepsy in Parry-Romberg Syndrome and Linear Scleroderma En Coup De Sabre: Case Series and Systematic Review of the Literature. *Under review*, January 2021

E. Christensen and J. Zylberberg. Models of primate ventral stream that categorize and visualize images. *Under review*, December 2020. https://doi.org/10.1101/2020.02.21.958488

W. F. Kindel, **E. Christensen**, and J. Zylberberg. Using deep learning to reveal the neural code for images in primary visual cortex. *Journal of Vision*, 19(4):29–29, April 2019. http://dx.doi.org/10.1167/19.4.29

E. Christensen, A. Abosch, J. A. Thompson, and J. Zylberberg. Inferring sleep stage from local field potentials recorded in the subthalamic nucleus of Parkinson's patients. *Journal of Sleep Research*, November 2018. http://dx.doi.org/10.1111/jsr.12806

J. T. Kirk, G. E. Fridley, J. W. Chamberlain, **E. Christensen**, M. Hochberg, and D. M. Ratner. Multiplexed inkjet functionalization of silicon photonic biosensors. *Lab on a chip*, 11(7):1372–1377, April 2011. http://dx.doi.org/10.1039/C0LC00313A

Patents

J. Zylberberg, **E. Christensen**, J. A. Thompson, and A. Abosch. Deep Brain Stimulation Using Artificial Neural Networks. *U.S. Provisional Patent Application No. 62/758,484*, filed 9/11/2018

Presentations

E. Christensen and J. Zylberberg. Disentangling "what" and "where" visual information in neural network vision models. In *Society for Neuroscience*, Chicago, IL, October 2019

E. Christensen, A. Abosch, J. A. Thompson, and J. Zylberberg. Inferring sleep stage from local field potentials recorded in the subthalamic nucleus of Parkinson's patients. In *CU-MSTP Annual Retreat*, March 2019

E. Christensen, A. Desai, T. Banack, J. Zylberberg, and N. Clendenen. Metabolomic Profiling Reveals Sex Differences and a Reduction in Metabolism after Remote Ischemic Preconditioning. In *Association of University Anesthesiologists*, Montreal, Canada, May 2019

E. Christensen, A. Desai, T. Banack, J. Zylberberg, and N. Clendenen. Metabolomic Profiling Reveals Sex Differences and a Reduction in Metabolism after Remote Ischemic Preconditioning. In *International Anesthesia Research Society*, Montreal, Canada, May 2019

E. Christensen and J. Zylberberg. Disentangling "what" and "where" visual information in neural network vision models. In *VISTA Distinguished Visiting Trainee Seminar*, Toronto, Canada, May 2019. York University

W. F. Kindel, **E. Christensen**, and J. Zylberberg. Using deep learning to reveal the neural code for images in primary visual cortex. In *Computational and Systems Neuroscience* (*CoSyNe*), Denver, CO, March 2018

E. Christensen and J. Zylberberg. Machine learning applications in neuroscience. In *MSTP Advanced Topics*. University of Colorado, February 2018

E. Christensen. In *Summer Workshop on the Dynamic Brain*. Allen Institute for Brain Science, August 2017

E. Christensen and M. Han. Role of rasal2 in the development of obesity. In *MSTP Advanced Topics*. University of Colorado, November 2016

E. Christensen and J. Hesselberth. Identifying -1 programmed ribosomal frameshifting genomic regions. In *MSTP Advanced Topics*. University of Colorado, September 2015

E. Christensen, B. Boyko, D. M. Ratner, and M. Hochberg. Silicon Photonics for Biosensing Applications. In *Mary Gates Research Symposium*. University of Washington, May 2011

C. Mount, **E. Christensen**, A. Leone, and P. Hiremath. Modular Healthcare Diagnostics for the Developing World. In *National Academy of Engineering Grand Challenges Summit*, Los Angeles, October 2010

E. Christensen, D. M. Ratner, and M. Hochberg. Rapid Prototyping Silicon Photonics for Biosensing Applications. In *University of Washington Summer Undergraduate Research Symposium*, Seattle, August 2010

K. Asplund, A. Leone, P. Hiremath, C. Mount, and **E. Christensen**. Transcutaneous Bilirubinometer and Mobile EKG Diagnostics. In *National Academy of Engineering Grand Challenges Summit*, Seattle, April 2010

E. Christensen, M. Orellana, L. Pang, and N. Baliga. Evidence for Metabolic Coupling in Hypersaline Microbes. In *Institute for Systems Biology Poster Symposium*, Fremont, WA, August 2009

Minor Awards

2012 - 1st Place, ATT Sponsored Mobile App Hackathon

2011 - Bioengineering Departmental Honors

2011 - Bioengineering Student Leadership Award - Awarded annually to a bioengineering senior(s) that exemplifies leadership in the department and their community.

2010 - 1st Place, National Academy of Engineering Grand Challenges Summit - Regional engineering design competition for undergraduates sponsored by the NAE.

2010 - Finalist, University of Washington Global Social Entrepreneurship Competition - Business case competition with an emphasis on global health.

Leadership and Service

2020 - ACP Family Head, CU SOM ACP families are led by senior students and provide a way to connect students across all levels of medical school training

2020 - Project Lead CU MSTP Student Council intranet

2020 - Project Lead CU MSTP Website redesign workgroup

2020 - Student Representative CU MSTP Curriculum Reform Committee

2020 - Student Representative CU MSTP Clinical Associate Director Search Committee

2019 - Treasurer, CU MSTP Student Council

2019 - Executive Committee Policy Chair, CU MSTP Student Council

2018,2019 - Class Representative, CU MSTP Student Council

2018 - Founding member, CU MSTP Student Council

2016 - Conference Organizer, MD/PhD National Student Conference

2011 - Class Student Speaker, Bioengineering Graduation Ceremony
Graduating BioE seniors are nominated to represent their graduating class and speak at the graduation ceremony; 1 chosen annually.

2011 - Bioengineering Honors Service Project

2011 - Teaching Assistant / Grader, Univ. of Washington Dept. of Bioengineering

2009,2010,2011 - Bioengineering Highschool Education Outreach, Education outreach project to engage local highschoolers and foster interest in STEM fields.

2009,2010,2011 - Project Lead / Co-Founder, Bioengineers Without Borders Student Organization.

Professional Affiliations

American Society of Anesthesiologists

American Association for the Advancement of Science

Association of American Medical Colleges

Society for Neuroscience

Colorado Medical Society