DARIL EVAN BROWN II

PhD Candidate
Neural Engineer

UC San Diego, San Diego CA

https://darilbii.github.io/

Core Values: Compassion, Authenticity, and Camaraderie

Research interests: Neural Technology, Brain Computer Interfaces, Vocal Communication, Motor Control, Medical Devices, and Open Science.

- I am a engineering researcher at UCSD working to understand the neural basis of vocal production in songbirds and its implication for the development of a human speech prosthesis.

- I maintain a open source python package, BirdSongToolbox, for analyzing free behaving songbird data

- I am a strong believer in 'reaching back as I strive forward', as such I frequently volunteer in mentorship and teaching opportunities to help train the next generation of scientists and engineers. Including *STARS* , *Academic Connections*, *CAFÉ*, and many others.

- Outside of my research and teaching efforts, I participate in various science communication efforts to communicate important science and engineering concepts to the broader public.

EDUCATION

PhD 2016-present	Electrical and Computer Engineering Department, UC San Diego, La Jolla, CA advised by Vikash Gilja & Timothy Gentner
MS 2014-2016	Bioengineering Department, UC San Diego, La Jolla, CA advised by Todd Coleman
BS 2010-2014	Howard University, Washington, DC Major: Mechanical Engineering *Cum Laude*

Certifications

UC San Diego 2017-2018	Gordon Engineering Leadership Center, Jacobs School of Engineering, La Jolla, CA *Gordon Scholars Engineering Leadership Program*
UC San Diego 2016-2017	Institute for the Global Entrepreneur, Rady School of Management, La Jolla, CA *Technology Management and Entrepreneurism Fellowship*
UC San Diego 2016	Rady School of Management, La Jolla, CA *Micro-MBA*

Summer Courses

MBL & MIT 2018	Marine Biological Laboratory (MBL), Woods Hole, MA MIT Brains, Minds, and Machines Summer Course
Allen & UW 2019	The Allen Institure & UW Conputational Neuroscience Center, Seattle, WA Summer Workshop on the Dynamic Brain

EXPERIENCE

Research Experience

UC San Diego 2016–present	Graduate Researcher UC San Diego Electrical Engineering Department | La Jolla, CA Mentored by Vikash Gilja, Ph.D., Tim Gentner, Ph.D., and Bradley Voytek, Ph.D. *Research Aim*: Develop methods for decoding the neural encoding of pre-motor regions in songbirds. This work aims to help develop a real-time bird song prosthesis that will serve as a proof of concept for human speech prosthesis.
UC San Diego 2013-2016	Graduate Researcher UC San Diego Bioengineering Department | La Jolla, CA Mentored by Todd Coleman, Ph.D. *Research Aim*: Develop module that utilizes NFC technology to noninvasively monitor the health of the residual limb of a patient through there prosthetic.

Howard University 2013–2014	Howard RockSat-C Team Howard University | Washington, D.C. Mentored by Marcus Alfred, Ph.D. *Research Aim*: Successfully capturing and measuring an atmospheric sample at the peak of flight to prove the existence of a self-contained ecosystem in the Mesosphere. Successfully Launched payload into the Atmosphere at the Wallops Air Field.
Sandia National Labs & **Howard University** 2013–2014	Senior Project Howard University | Washington, D.C. Mentored by Grant Warner, Ph.D and Timothy O'Hern, Ph.D. *Research Aim*: Develop a flow loop to investigate the conditions that cause the inception of cavitation.
UC San Diego **Neural Interaction Lab** 2013	Undergraduate Researcher UC San Diego STARS | La Jolla, CA Mentored by Todd Coleman, Ph.D *Research Aim*: Utilize flexible electronics that used surface electrode electromyography to understand vocal and sub-vocal speech to aid patients with neurodegenerative diseases and enable communication.
University of Buea, **Howard University &** **NSF** 2013	Undergraduate Researcher GEAR-UP: Cameroon | Buea, Cameroon. Mentored by Wayne Patterson, Ph.D. and Tendo Foba, Ph.D. *Research Aim*: Increase global academic interest in a possible biomaterial sources found in Cameroon and Southern Asia and investigate if it can be used to lower cost of infrastructure in developing areas.
US Air Force, **Howard University &** **Georgia Tech** 2011–2013	Contractor / Undergraduate Researcher. Air Force Research Lab, WPAFB | Dayton, OH Mentored by: James Hammonds, Ph.D. and Baratunde Cola, Ph.D. *Research Aim 1*: Study the passive control of thermal heat pumping using silicon nanoparticles and their unique characteristics. *Research Aim 2*: Characterize various Nano-Dyes and understand their optical properties for novel applications in industry.

Industry Experience

Northrop Grumman 2014	College Intern, Medium Range Tactical System Northrop Gumman Corporation | Rancho Bernardo, California Supervised by Carlos Gonzales

PUBLICATIONS

Manuscripts in Preparation

[1] **D. E. Brown II**, D. H. Nguyen, E. Duval, A. Kadwory, P. Tostado, J. Chavez, E. Arneodo, V. Gilja, T. Gentner. "Dynamic Weight Counterbalance System for Chronic Small Animal Experiments using a Variable Radius Pulley". *In Preparation*

[2] **D. E. Brown II**, P. Tostado, J. Chavez, D. H. Nguyen, A. Kadwory, B Voytek, E. Arneodo, V. Gilja, T. Gentner. "Real-Time Decoding of Vocal Behavior in Awake Free-Behaving Zebra Finch". *In Preparation*

Journal Publications

[3] **D. E. Brown II**, J. I. Chavez, D. H. Nguyen, A. Kadwory, B. Voytek, E. Arneodo, T. Q. Gentner, and V. Gilja, "Local Field Potentials in a Pre-motor Region Predict Learned Vocal Sequences," PLOS Computational Biology 17, no. 9, Sept. 2021. doi: 10.1101/2020.06.30.179861.

[4] E. M. Arneodo, S. Chen, **D. E. Brown II**, V. Gilja, and T. Q. Gentner, "Neurally driven synthesis of learned, complex vocalizations," Current Biology, p. S0960982221007338, Jun. 2021, doi: 10.1016/j.cub.2021.05.035.

Datasets

[5] **Brown, Daril**; Arneodo, Ezequiel; Gentner, Timothy Q; Gilja, Vikash (2021): Chronic Recording of HVC in Free Behaving Zebra FInch with Behaviors Hand Annotated. figshare. Dataset, doi: https://doi.org/10.6084/m9.figshare.15094219.v2.

AWARDS & HONORS

Siebel Scholars Fdn. 2021	Siebel Scholar (Class of 2022: Bioengineering)
UC San Diego 2021	Finalist in the UC San Diego Grad Slam Competition (2nd Place)
Bouchet Honor Society 2021	Bouchet Graduate Honor Society (inducted April 8th 2021)
UC San Diego 2020	Finalist in the UC San Diego Grad Slam Competition (Top 10)
Gordon Center 2018-2019	Named a *Gordon Scholar* at the Gordon Center for Engineering Leadership at UC San Diego
UC San Diego 2018	Finalist in the UC San Diego Grad Slam Competition (Top 10)
IGE 2016-2017	Recipient of the Institute for the Global Entrepreneur (IGE) Technology Management and Entrepreneurism Fellowship
University of California 2014-present	Awarded the University of California Office of the President UC-HBCU Fellowship
NSF 2014-2019	Awarded the National Science Foundation (NSF) Graduate Research Fellowship
Jackie Robinson Fdn. 2014	Received the Electronic Arts Excellence in Engineering Award
NSF 2014	Second Place Oral Presentation. Emerging Researchers National (ERN) Conference in STEM
Tau Beta Pi July 2013	Tau Beta Pi Engineering Honor Society Initiate
Air Force Research Lab 2011	Innovative Seal of Approval for Air Force Research
Jackie Robinson Fdn. 2010-2014	Jackie Robinson Foundation Scholar
Howard University 2010-2014	4-year recipient of the Howard University Capstone Scholarship, Inducted into the Drew Hall Honor Society

TEACHING

Cogs 18 Fall 2018	Introduction to Python *teaching assistant – UC San Diego*
Academic Connections Summer 2016 & 2017	Introduction to Mechanical Engineering *lead instructor – UC San Diego Extension*
Physics 1AL Spring 2016	Mechanics Laboratory *lab instructor – UC San Diego*
Beng 100 Winter 2015	Introduction to Probability and Statistics for Bioengineers *teaching assistant – UC San Diego*
EGPP-102 Spring 2014	Introduction of Engineering II *teaching assistant – Howard University*
EGPP-101 Fall 2013	Introduction of Engineering I *teaching assistant – Howard University*

updated June 2021

TALKS

February 2022	*Steven Universe* Her Royal Science Podcast
December 2021	*Expanding the Songbird Animal Model: Developing a Brain-to-Chirp Interface* Wisconsin Institute for Translational Neuroengineering (WITNE), Madison, WI
May 2021	*Forefront of Research: NeuroTech Meets Birdsong* NeuroTech@UCSD 2021, La Jolla, CA
April 2021	*From Singing to Speaking: Making a Brain-to-Tweet Interface* UCSD Grad Slam 2021, La Jolla, CA
September 2020	*Singing Chops* Rad Scientist Podcast, San Diego, CA
April 2020	*From Singing to Speaking: Making a Brain-to-Tweet Interface* UCSD Grad Slam: Graduate Student Virtual Research Showcase 2020, La Jolla, CA
April 2018	*From Singing to Speaking: Lessons Learned from Songbirds* UCSD Grad Slam 2018, La Jolla, CA

MENTORING

Xavier Perez 2019-present	Undergraduate, UC San Diego Electrical Engineering *Currently GEM Fellow and PhD Student at UC San Diego*
Adam Kadwory 2019-present	Undergraduate, UC San Diego Bioengineering *Authorship on 3 presented works & Gordon Scholar*
Jairo Chavez 2018-present	Undergraduate, UC San Diego Cognitive Science *Authorship on 3 presented works & Awarded HDSI Scholarship*
Derek Nguyen 2018-present	Undergraduate, UC San Diego Bioengineering *Authorship on 3 presented works & Awarded ABRCMS Travel Grant* *Currently PhD Student at University of Arizona*
Taylor Nelson 2015-2017	Undergraduate, UC San Diego Bioengineering
Thomas Dawkins 2015-2017	Undergraduate Student, UC San Diego Electrical Engineering *Now engineer at Qualcomm. Earned Masters at UC San Diego*
Dean Hermanudin 2015-2016	Undergraduate, UC San Diego Computer Science *Now software engineer at Lyft. Earned Masters at Georgia Tech*
Vincent Janiak summer 2015	Visiting International Undergraduate Researcher, University of Paris-Saclay
Mathys Lemos summer 2015	Summer High School Student Researcher

OUTREACH & SERVICE

Academic Outreach

Cuyamaca College Partnership 2020–present	Graduate Mentor for the Cuyamaca College STEM Guided Pathway Partnership with UC San Diego. I guided community college students through laboratory research and led them through exercises to introduce them to coding in python.
STARS 2019	Graduate Mentor for the UC San Diego Summer Training Academy for Research Success (STARS) program. I mentored students from various backgrounds on how to conduct research, present findings, network professionally, and apply to graduate school.
CAFÉ 2012–2014	Tutored elementary school students in Math and Language arts as part of the Cultural Academy for Excellence (CAFÉ). Organized lesson plans to prepare students for their grade's curriculum
SIMBA Mentorship 2010–2012	Mentored Inner-City Youths at the Maya Angelou Charter School in Washington, D.C. Taught skills in financial literacy, deductive reasoning, and conflict resolution.

updated June 2021

Service

ComSciCon
2019–present
As a ComSciCon Ambassador I help share The Communicating Science workshop for graduate students, (ComSciCon), with new audiences and contribute to the sustainability of the student run workshops.

Habitat for Humanity
2013
Assisted in the construction of two houses in the District of Columbia

ABSTRACTS

Conference Abstracts

[1] **D. Brown**, E. Arneodo, S. Chen, T. Gentner, V. Gilja. LFP based classification of vocalizations in free-behaving zebra finch. Poster Presented at: 2018 Annual Meeting of Society for Neuroscience. 2018 Nov 6; San Diego, Ca.

[2] S. Chen, E. M. Arneodo, **D. E. Brown**, II, V. Gilja, T. Q. Gentner. A brain-machine-interface to generate vocal communications. Poster Presented at: 2018 Annual Meeting of Society for Neuroscience. 2018 Nov 6; San Diego, Ca.

[3] **D. Brown**, E. Arneodo, T. Gentner, V. Gilja. Classification of Naturalistic Birdsong Vocalizations. Poster Presented at: 2017 Annual Meeting of Society for Neuroscience. 2017 Nov 11-15; Washington, D.C.

[4] **D. Brown**, W. Jiang, T. Pailla, E. Arneodo, T. Genter, V. Gilja. Bird Song Syllable Decoding from Neural Activity. . Poster Presented at: 2016 Annual Meeting of Society for Neuroscience. 2017 Nov 12-16; San Diego, Ca.

[5] S. Fatone, PhD, BPO(Hons), Y. Huang, PhD, T. Coleman, PhD, J. Rogers, PhD, A. Banks, L. Tran, R. Caldwell, CP, **D. Brown**, M. Pharr. Interface Monitoring System to Promote Residual Limb Health. NSF Smart and Connected Health Principal Investigators Workshop, July 2015

[6] **D E Brown**, W A Patterson, J N Foba. Comprehensive Characterization of the Areca Catechu Palm Fiber and its Utilities. Emerging Researchers Conference, February 2014.

[7] **D E Brown**, T P Coleman. Quantitative Modeling of Throat EMG During Speech. UCSD Summer Research Conference on Neurological Disorders & Stroke, Pg. 46, August 2013

[8] **D E Brown**, J S Hammonds, B A Cola. Controlled Thermal Conductivity. Minority Leaders Program Review for the Sensors and Materials Directorates, November 2011

[9] **D E Brown**, J S Hammonds, B A Cola. Controlled Thermal Conductivity. Air Force Research Lab Undergraduate Researchers Conference. July 2011

Mentee Abstracts

[10] Jairo Chavez, **Daril Brown**, Pablo Tostado, Derek Nguyen, Ahmed Abdalsattar, Ezequiel Arneodo, Bradley Voytek, Timothy Gentner, Vikash Gilja. Local Field Potential Phase Preference to Song Onset in Avian Premotor Region HVC. Abstract presented at: Cognitive Neuroscience Society 2020 May 3; Virtual.

[11] Derek Hung. Nguyen, **Daril Brown**, Ahmed Abdalsattar, Jairo Chavez, Pablo Tostado, Vikash Gilja, Timothy Gentner. Integration of a Variable Radius Pulley and Active Commutator System for Electrophysiology Recordings in Small Animals. Poster Presented at: Annual Biomedical Research Conference for Minority Students. 2019 Nov 13-16; Anaheim, Ca.

[12] Adam Kadwory, **Daril Brown**, Pablo Tostado, Jairo Chavez, Derek Nguyen, Vikash Gilja, Timothy Gentner. Development Towards a Headcap with an integrated Counterweight System for Electrophysiology in Small Animals. Talk given at: Annual Biomedical Research Conference for Minority Students. 2019 Nov 13-16; Anaheim, Ca.

[13] Jairo Chavez, **Daril Brown**, Pablo Tostado, Ahmed Abdalsattar, Derek Hung. Nguyen, Vikash Gilja, Timothy Gentner, Bradley Voytek. Linking Spiking Activity and LFP Phase Bands in the Avian Brain. Poster Presented at: Annual Biomedical Research Conference for Minority Students. 2019 Nov 13-16; Anaheim, Ca.