

### Areas of Expertise

Application of VR/AR to a clinical exam-room environment, Strategic consulting for corporate artificial intelligence, Data analysis and visualization at scale, theoretical (and applied) tendon-driven motor control.

### Academic Summary

<b>University of Southern California</b> <i>Ph.D. Computer Science, Viterbi Dean's Doctoral Fellowship</i>	<i>2015-Present</i>
<b>University of Southern California</b> <i>Masters Degree - Computer Science</i>	<i>2018</i>
<b>Pitzer College</b> <i>B.A. with Honors - Computational Biology</i>	<i>2014</i>

### Experience

<b>USC Viterbi School of Engineering</b> <i>Los Angeles, California</i>	<i>May 2015 - Present</i> <b>Computer Science Ph.D. Student</b>
<ul style="list-style-type: none"><li>• Wrote a neural network learning algorithm to control a human cadaveric hand by its muscles.</li><li>• Mentored over 40 industry-projects through the USC Capstone Program</li><li>• Designed partnerships with USC, Northeastern University, and Pomona College to host 22 internship fellows with funding or credit, and led teams in designing research-grade code.</li></ul> <p><i>Tools: Scala, Python, R Spark, EMR, HDFS, R, D3.js, Meteor.</i></p>	
<b>Swiss Federal Institute of Technology</b> <i>Zürich, Switzerland</i>	<i>April 2015 - May 2015</i> <b>Visiting Computer Scientist</b>
<ul style="list-style-type: none"><li>• Taught biostatistical techniques to 5 professors and 6 students at the Department of Theoretical Computer Science.</li><li>• Presented multiple research talks in Zürich and published research in IEEE EMBC in Milan, Italy.</li></ul> <p><i>Tools: Scala, Java, Spark, HDFS, Python, R, Amazon EC2, and MongoDB.</i></p>	
<b>Toyota Motor Sales</b> <i>Torrance, California</i>	<i>January 2015 - April 2015</i> <b>Consultant</b>
<ul style="list-style-type: none"><li>• Single-handedly developed a crowd-sourced data validation platform that connected with tens of thousands of participants.</li><li>• Evaluated the statistical effectiveness of machine learning algorithms implemented.</li><li>• Identified significant flaws in a model, and provided exceptional data-driven evidence for the new redesign.</li></ul> <p><i>Tools: Amazon Mechanical Turk, Python, R, D3.js, Scala, mllib, and HDFS.</i></p>	
<b>Eli Lilly and Company</b> <i>Indianapolis, Indiana</i>	<i>September 2013 - May 2014</i> <b>Consultant</b>
<ul style="list-style-type: none"><li>• Interfaced directly with Tony Zhang, the Vice President of R&amp;D-Asia for 9 months.</li><li>• Led a team of six people in developing proprietary software to improve patient compliance.</li><li>• Wrote a real-time machine-learning pipeline that tags tweets about issues with competing medications.</li></ul> <p><i>Tools: AWS, Python, scikit-learn, R and D3.js.</i></p>	

## Publications

- Autonomous functional locomotion in a tendon-driven limb via limited experience 2018  
*Submitted, Under Evaluation: Science Robotics*  
Marjaninejad A, Urbina-Meléndez D, **Cohn BA**, Valero-Cuevas FJ
- Quantifying and attenuating pathologic tremor in virtual reality 2018  
*Quantitative Biology: arXiv.org*  
**Cohn BA**, Shah DD, Marjaninejad A, Shapiro M, Ulkumen S, Laine CM, Valero-Cuevas FJ, Hayashida KH, Ingersoll S
- "Feasibility Theory reconciles and informs alternative approaches to neuromuscular control" 2018  
Frontiers in Computational Neuroscience  
**Cohn BA**, Szedlák M, Gärtner B, Valero-Cuevas FJ
- "Exploring the nature of muscle redundancy via subject-specific and generic musculoskeletal models" 2015  
Featured Publication: Journal of Biomechanics, 2015.  
Valero-Cuevas FJ, **Cohn BA**, Yngvason HF, Lawrence EL
- "Eye histology and ganglion cell topography of northern elephant seals (*Mirounga angustirostris*)."  
The Anatomical Record, 2016. 2016  
Smodlaka H, Khamas W, Palmer L, Lui B, Borovac J, **Cohn BA**, Schmitz L
- "Structure of the set of feasible neural commands for complex motor tasks" 2015  
37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society  
Valero-Cuevas FJ, **Cohn BA**, Szedlák M, Gärtner B, Fukuda K
- "Retinal topography maps in R: new tools for the analysis and visualization of spatial retinal data." 2015  
Journal of Vision July 2015, Vol.15, 19.  
**Cohn BA**, Wainwright P, Collin S, Schmitz L

## Intellectual Property

Cohn, BA. "METHOD AND APPARATUS FOR CONTINUOUSLY PRODUCING ANALYTICAL REPORTS"  
U.S. Patent Application No.: 15/645,860. 7 Jul. 2017.

## News and Press

<a href="#">PCMag</a>	Sep-2018
<a href="#">WITH FoundationVideo</a>	Sep-2018
<a href="#">The Ambient</a>	Sep-2018
<a href="#">Chicaco Now</a>	Sep-2018
<a href="#">KeckGrad - Keck Graduate Institute</a>	Jul-2018
<a href="#">USC News</a>	Mar-2017
<a href="#">Pitzer College News</a>	Apr-2017
<a href="#">USC-News: Health</a>	Apr-2017

### Current Project Involvement

**PD-Paradigm** A VR Experience that quantifies symptoms of Tremor in Parkinson's Disease — Lead Scientist  
Collaborators: Sarah Ingersoll, Kenneth Hayashida, Francisco Valero-Cuevas

**CP-Paradigm** A VR-EEG-EMG-DBS assessment platform for children with Cerebral palsy — Lead Scientist  
Collaborators: Terence Sanger (Children's Hospital of Los Angeles), Francisco Valero-Cuevas

**Wheel** A virtual reality system for acquiring muscle coherence patterns — Technical Lead  
Collaborators: Christopher Laine, Francisco Valero-Cuevas

**Amplify** A choose-your-own-adventure style game to provide voice therapy treatment for Cerebral Palsy patients  
Collaborators: Christopher Laine, Juan Espinoza (Children's Hospital of Los Angeles)

**Kleo** Dextrous control of a bio-inspired tendon-driven robot — Head of Transfer Learning Effort  
Collaborators: Ali Marjaninejad, Darío Urbina-Meléndez, Francisco Valero-Cuevas

**Cradle** A solution for reducing chronic back pain — Entrepreneurship Lead  
HTE@USC Student Project

### Funding

NSF Graduate Research Fellowship   Recipient	Mar-2017
NSF Graduate Research Fellowship   Honorable Mention	Mar-2016
Cancer Research Fellowship, USC Michelson Center for Convergent Bioscience	Apr-2017
USC Viterbi Dean's Doctoral Fellowship	May-2015
Howard Hughes Medical Institute Research Grant	Apr-2013

### Selected Awards

\$10,000 Grand Prize, USC CBC & WITH Foundation Voice-Computing Hackathon	Jul-2018
Finalist, American Academy of Neurology (AAN) Brain Storm	Apr-2018
Finalist and HTC Vive Industry Pick, Creating Reality Hackathon	Mar-2017
3 <sup>rd</sup> Place, Oral Presentations. 6 <sup>th</sup> Annual SWOB SICB Meeting	Oct-2017
Top 10 Finalist, USC Stevens Innovator Showcase	Oct-2017
Alternative Muscle Club Young Investigator Award, by Genera Biocells	Sep-2017
Student Travel Grant, De Luca Foundation	May-2017
2 <sup>nd</sup> Prize, USC CancerBase Hackathon	Apr-2017
Top 8 Finalist, Viterbi Innovation Maseeh Prize Competition (\$2.5k Award)	Nov-2016
Top 10 Finalist, USC Stevens Innovator Showcase	Oct-2016
Microsoft US Imagine Cup Winter Semi-Finalist	Dec-2015
\$24,000 Rackspace Startup Credits	Dec-2015
\$5,000 AWS Prize, USC Venture Incubation Program (Virtual Reality)	Nov-2015
\$5,000 AWS Prize, USC Venture Incubation Program (Biomedical Compute Cloud)	Nov-2015
\$10,000 Grand Prize (USC Virtual Medicine Competition) IEEE Standards Association	Oct-2015
USC Health Technology Innovation Fellowship in Digital Health	Aug-2015
20,000 Compute-Hour Credits, USC HPC Cluster	Nov-2014
Pitzer College Student Research Award	Nov-2013
Pitzer College Student Research Award	Mar-2013

### Talks and Posters

Poster: Society for Neuroscience, San Diego	Nov-2018
Talk: The Southern California Biomedical Council, Los Angeles	Feb-2018
Talk: Los Angeles Venture Association, Los Angeles	Feb-2018
Talk: South West Regional Meeting of Organismal Biologists SICB	Oct-2017
Podium Presentation: Alternative Muscle Club 5th Annual Meeting	Sep-2017
Talk: MedTechWorld-West Annual Conference, Anaheim	Feb-2017
Poster: Society for Neuroscience, San Diego	Nov-2016
Talk: U. of Minnesota Computational Sensory-Motor Neuroscience (CoSMo)	Mar-2016
Poster: Winter Workshop on Neuromechanics, New Orleans	Jan-2016
Talk: National Science Foundation - Innovation (I) Corps Fall Networking Event	Nov-2015
Talk: 37th Annual International IEEE Engineering in Medicine and Biology Society, Milan Italy	Aug-2015
Talk: USC Viterbi School of Computer Science Seminar Series	Aug-2015
Poster: 39th Annual Conference of the American Society of Biomechanics	Aug-2015
Poster: 25th Annual Conference of the Society for the Neural Control of Movement	Apr-2015
Talk: Masters Capstone Research Symposium, Keck Graduate Institute	May-2014
Talk: Masters Project Thesis Defense, Keck Graduate Institute	Apr-2014
Talk: Public Masters Capstone Talk, Keck Graduate Institute	Dec-2013
Invited speaker: UC Davis FishLab	Oct-2013
Talk: Regional Society for Integrative and Comparative Biology, UC Riverside	Oct-2013
Talk: Science Department Symposium, Keck Graduate Institute	Oct-2013
Poster: Mathematical Bioscience Institute, Ohio State University	Jul-2013
Talk: Howard Hughes Medical Institute Student Seminar	Apr-2013

### Teaching

T.A. For Computer Science 401: Capstone	Spring-2018
Professor Jeffrey Miller, Ph.D. Role: Mentored over 30 teams, each of 2-8 undergraduate students and liased with project leads with industry partners	

### Workshops

Invited Speaker Keck Graduate Institute, <i>IndustryTalk</i> , Claremont CA "Artificial intelligence as a competitive strategy in biotech"	Jul-2018
Panelist BioTech Connection Los Angeles, UCLA	Dec-2016
Workshop Speaker Summer School in Computational Sensory-Motor Neuroscience, Minneapolis, MN	Aug-2016
Panelist MedTech-World Conference EAST, New York City, NY "Making Sense of Big Data: Determining Actionable Data & Your Roadmap for Utilization"	Jun-2016
Panelist Annual Medical Device & Manufacturer - MedTech-World Conference WEST, Anaheim, CA "Making Sense of Big Data: Determining Actionable Data & Your Roadmap for Utilization"	Feb-2016
Invited Lecturer USC Marshall School of Business, MBA Program "Financial analytics and scalable visualizations in R"	Feb-2016
Guest Lecture for BME 504 USC Viterbi School of Engineering; Graduate School Department of Biomedical Engineering "Linear program design for tendon driven systems"	Oct-2015
Guest Lecture for Neuromuscular Systems USC Division of Biokinesiology and Physical Therapy "Neuromechanical optimization in open source software" <a href="https://github.com/briancohn/biokinesiology">https://github.com/briancohn/biokinesiology</a>	Oct-2014
PharmaPack North America Conference "Driving Pharmaceutical Product Design with Consumer Intelligence"	Jun-2014
Eli Lilly and Company Headquarters "Big Data Analytics in Post-Market Surveillance and Pharmacological Vigilance"	May-2014
Guest Lecture for Sensory Evolution W.M. Keck Science Department "Retinal Specializations in the Vertebrate Eye"	Apr-2014
National Society for Integrative and Comparative Biology "Influence of Zooplanktivory on Retinal Ganglion Cell Topography in Labrid Reef Fishes"	Jan-2014

### Journal Reviewer

Nature, Scientific Reports	Jul-2018
Elsevier, Journal of Biomechanics	Sep-2017