Brian A. Cohn

briancohn.com
GitHub.com/bc

Los Angeles: (323) 455-4184
briancohn@kaspect.com

Curriculum Vitae

March 25, 2020

Professional Areas

Neuromechanics of vertebrates and robots (Ph.D. Thesis), Application of VR/AR to a clinical exam-room environment, Strategic consulting for biotech artificial intelligence to Fortune 10 companies, Data analysis and visualization at scale, design and fabrication of custom scientific equipment.

Academic Summary

Ph.D. Computer Science, Viterbi Dean's Doctoral Fellowship *2015-Present*
University of Southern California

Graduate Certificate - Health Technology and Engineering *2019*
University of Southern California

Masters Degree - Computer Science *2018*
University of Southern California

B.A. with Honors - Computational Biology *2014*
Pitzer College

Current Research Support

National Science Foundation Graduate Research Fellowship (GRFP) *2017-2020*
PI: **Brian A. Cohn, M.S.**

2019-2020

Consortium for Technology & Innovation in Pediatrics (CTIP)
An FDA-Funded Medical Technology Accelerator
Co-PIs: **Brian A. Cohn, M.S.**, Christopher Laine, Ph.D.

2020

USC Marshall School of Business Incubator: Incubated Venture
Co-PIs: **Brian A. Cohn, M.S.**, Dr. Kenneth Hayashida, M.D.

Industry Experience

Microsoft Research *June 2019 - Present*
Redmond, Washington **Doctoral Research Intern**

- EPIC (Extended Perception Interaction and Cognition) with Mar Gonzalez-Franco
- Culminated in a peer-reviewed full-length article accepted to IEEEVR 2020.

Tools: Unity, C#, R, Python, Bash, Hololens 2, and Vive Pro

Toyota Motor Sales *January 2015 - April 2015*
Torrance, California **Consultant to**

- Identified significant flaws in a deployed model, and provided exceptional data-driven evidence for the new redesign.
- Single-handedly developed a crowd-sourced data-validation system, connecting tens of thousands of participants.
- Evaluated the statistical effectiveness of machine learning algorithms implemented.

Tools: AWS mTurk, Scala, Python, R

Eli Lilly and Company *September 2013 - May 2014*
Indianapolis, Indiana **Consultant to**

- Interfaced directly with Tony Zhang, the Vice President of R&D-Asia for 9 months.
- Led a team of six people in developing proprietary software to improve patient compliance.
- Wrote a real-time machine-learning pipeline that tags tweets about issues with competing medications.

Tools: AWS, Python, scikit-learn, and R

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Peer-Reviewed Journal Articles

"Autonomous Functional Movements in a Tendon-Driven Limb via Limited Experience" *2019*
Nature Machine Intelligence: Cover Article, March 2019
Marjaninejad A, Urbina-Meléndez D, **Cohn BA**, Valero-Cuevas FJ

"Feasibility Theory reconciles and informs alternative approaches to neuromuscular control" *2018*
Frontiers in Computational Neuroscience
Cohn BA, Szedlák M, Gärtner B, Valero-Cuevas FJ

"Eye histology and ganglion cell topography of northern elephant seals (Mirounga angustirostris)." *2016*
The Anatomical Record, 2016.
Smodlaka H, Khamas W, Palmer L, Lui B, Borovac J, **Cohn BA**, Schmitz L

"Exploring the nature of muscle redundancy via subject-specific and generic musculoskeletal models" *2015*
Journal of Biomechanics, 2015; *Featured Publication*
Valero-Cuevas FJ, **Cohn BA**, Yngvason HF, Lawrence EL

"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

Full-length Peer-Reviewed Conference Papers

"The Self-Avatar Follower Effect in Virtual Reality" *2020*
Proceedings of IEEE VR 2020, March 2020
Gonzalez-Franco, M, **Cohn BA**,Burin D, Ofek E, Maselli A

"Virtual Reality for Post-Stroke Rehabilitation" *2020*
Proceedings of IEEE VR 2020, March 2020
Boyd TA, Nahe E, **Cohn BA**, Barmaki R

"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

Submitted Manuscripts

"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

Project Involvement

Kaspect Reach
Undisclosed clinical study regarding artificial intelligence and health insurance. PI: Brian Cohn, Co-PI: Kenneth Hayashida, M.D. Active IRB: HS-18-00345

ReachVR Therapeutic application of virtual reality: development of a neuromotor reflex assessment system — Co-Investigator
Collaborators: Franklin S, Franklin D, (TUM Institute of Cognitive Systems and TUM Neuromuscular Diagnostics), and Valero-Cuevas FJ. Active IRB: HS-12-00228, CCI-13-00324; BaCaTech Grant

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

Kleo Dextrous control of a bio-inspired tendon-driven robot — Responsibilities: Transfer Learning and Data Acquisition
Collaborators: Ali Marjaninejad, Darío Urbina-Meléndez, Francisco J. Valero-Cuevas

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Intellectual Property

Cohn, BA. ""EFS ID 36180052"
U.S. Provisional Patent Application No.: 62856238. Jun. 3, 2019.

Cohn, BA. "NON-INTUITIVE MUSCULOSKELETAL MAPPING TO MIXED REALITY"
U.S. Provisional Patent; USC-0237-PRV; 2018-140, Nov. 15, 2018
USC Stevens Center for Innovation, Technology Transfer Office

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

News and Press

Science World Report	Apr-2019
Electronics Weekly	Apr-2019
Elite CME	Apr-2019
UDaily: University of Delaware	Mar-2019
TuniseSoir News	Mar-2019
ScienceDaily	Mar-2019
Nature: Editorial	Mar-2019
Longroom	Mar-2019
Nanowerk	Mar-2019
TechXplore: Robotics	Mar-2019
Neuroscience News	Mar-2019
USC Viterbi School of Engineering	Mar-2019
PCMag	Mar-2019
EurekAlert-AAAS Photo	Mar-2019
EurekAlert-AAAS Article	Mar-2019
USC Daily Trojan	Feb-2019
USC News	Jan-2019
Boston Globe ('Move2Improve')	Jan-2019
PCMag	Sep-2018
InMotion Magazine; Archive	Fall-2018
WITH FoundationVideo	Sep-2018
The Ambient	Sep-2018
Chicaco Now	Sep-2018
KeckGrad Podcast- Keck Graduate Institute	Jul-2018
USC News	Mar-2017
Pitzer College News	Apr-2017
USC-News: Health	Apr-2017
USC-Dornsife News	Apr-2017
Design News	Jun-2016

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Awards and Distinctions

Major Awards

National Science Foundation Graduate Research Fellowship | **Recipient**	Mar-2017
National Science Foundation 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
Keck Science Department Summer Research Grant	Apr-2013

Distinctions

Semi-Finalist, Humana-Mays Healthcare Analytics Case Competition on Opioid Prediction (AUC 0.92)	Sep-2019
4th Place, Viterbi Innovation Maseeh Prize Competition	Mar-2019
1st Prize, Amazon Alexa Voice Prize Competition - USC Viterbi	Mar-2019
2nd Prize, Consortium for Technology and Innovation in Pediatrics - Pitch Competition, ScaleLA	Jan-2019
Finalist, American Academy of Neurology (AAN) Brain Storm	Apr-2018
HTC Vive Industry Pick, Creating Reality Hackathon	Mar-2017
3rd Place, Oral Presentations. 6th Annual SWOB SICB Meeting	Oct-2017
Top 10 Finalist, USC Stevens Innovator Showcase	Oct-2017
Young Investigator Award, Alternative Muscle Club & Genera Biocells, San Diego, CA	Sep-2017
2nd 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
Semi-Finalist, Microsoft US Imagine Cup	Dec-2015
USC Health Technology Innovation Fellowship in Digital Health	Aug-2015

Awards

$7,500 Grand Prize, USC Viterbi - Alexa Prize	Apr-2019
$5,000 Legal Support, USC Maseeh Entrepreneurship Prize Competition	Mar-2019
$3,490 Grant, USC Viterbi - Alexa Prize	Mar-2019
$3,000 Grand Prize, Best VR, MIT Media Lab Reality Virtually Hackathon	Jan-2019
$10,000 Grand Prize, USC CBC & WITH Foundation Voice-Computing Hackathon	Jul-2018
Student Travel Grant, De Luca Foundation	May-2017
$10,000 Grand Prize (USC Virtual Medicine Competition) IEEE Standards Association	Oct-2015
Pitzer College Student Research Award	Nov-2013
Pitzer College Student Research Award	Mar-2013

Resources Awarded

$5,000 AWS Credits, USC Maseeh Competition	Mar-2019
$24,000 Rackspace Startup Credits, USC Viterbi Startup Garage	Dec-2015
$5,000 AWS Credits, USC Venture Incubation Program (Virtual Reality)	Nov-2015
$5,000 AWS Credits, USC Venture Incubation Program (Biomedical Compute Cloud)	Nov-2015

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Conference Presentations

Peer Reviewed Abstracts

South West Regional Meeting of Organismal Biologists SICB, UC Irvine, CA — Oct-2017
"Analytics for tendon-driven robotic limb endpoint force production"

37th Annual International IEEE Engineering in Medicine and Biology Society, Milan Italy — Aug-2015
"Structure of the set of feasible neural commands for complex motor tasks"

National Society for Integrative and Comparative Biology, Austin TX — Jan-2014
"Influence of Zooplanktivory on Retinal Ganglion Cell Topography in Labrid Reef Fishes"

Symposia

Talk: NeuroRehab Series, USC Department of Biokinesiology and Physical Therapy — Dec-2018
Invited Demo: WITH Foundation Beta Day, California Community Foundation — Nov-2018
Poster and Demo: USC Virtual Technologies for Health Symposium — Sep-2018
Talk: USC Viterbi School of Computer Science Seminar Series — Aug-2015
Talk: Masters Capstone Research Symposium, Keck Graduate Institute — May-2014
Talk: UC Davis College of Biological Sciences, FishLab — Oct-2013

Peer-Reviewed Posters

Society for Neuroscience (Poster A, Poster B), Chicago IL — Oct-2019
Society for Brain Mapping and Therapeutics, Los Angeles, CA — Mar-2019
Society for Neuroscience, San Diego, CA — Nov-2018
Society for Neuroscience, San Diego, CA — Nov-2016
Winter Workshop on Neuromechanics, New Orleans, LA — Jan-2016
39th Annual Conference of the American Society of Biomechanics, Columbus, OH — Aug-2015
25th Annual Conference of the Society for the Neural Control of Movement, Charleston, NC — Apr-2015
Mathematical Bioscience Institute, Ohio State University, Columbus OH — Jul-2013

Non-Academic Presentations

Keynote: Foundations of Digital Games "Games for Everyone"; Co-talk with Microsoft XBOX — Aug-2019
Talk: Unity Headquarters, San Francisco CA — Apr-2019
Expo Demo: Special Interest Group on Computer Science Education, Minneapolis MN — Feb-2019
Talk: Microsoft Health, Redmond WA — Jan-2019
Talk: Microsoft General Engineering, Redmond WA — Jan-2019
Talk: Microsoft University Relations, Accessiblity, and Device Teams, Redmond WA — Jan-2019
Talk: USC Body Computing Conference, Los Angeles — Sep-2018
Pitch: The Southern California Biomedical Council, Los Angeles — Feb-2018
Pitch: Los Angeles Venture Association, Los Angeles — Feb-2018
Talk: MedTechWorld-West Annual Conference, Anaheim — Feb-2017
Talk: National Science Foundation - Innovation (I) Corps Fall Networking Event — Nov-2015

Teaching

T.A. For Computer Science 401: Capstone — Spring-2018
Professor Jeffrey Miller, Ph.D. Role: Mentored over 30 teams working on industry-academia joint projects, each of 2-8 undergraduate students

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Academic Lectures

Invited *IndustryTalk* — Oct-2018
Keck Graduate Institute, Corporate Partnerships
"The Use of Virtual Reality Platforms for Clinical Applications"

Invited *IndustryTalk* — Jul-2018
Keck Graduate Institute, Corporate Partnerships
"Artificial intelligence as a competitive strategy in biotech"

Invited Lecturer — Feb-2016
USC Marshall School of Business, MBA Program
"Financial analytics and scalable visualizations in R"

Invited Lecturer — May-2015
ETH-Zúrich Department of Computer Science
"Hit-and-Run Sampling of Neuromechanical Polytopes"

Guest Lecture for BME 504 — Oct-2015
USC Viterbi School of Engineering; Graduate School Department of Biomedical Engineering
"Linear program design for tendon driven systems"

Guest Lecture for Neuromuscular Systems — Oct-2014
USC Division of Biokinesiology and Physical Therapy
"Neuromechanical optimization in open source software"

Guest Lecture for Sensory Evolution — Apr-2014
W.M. Keck Science Department
"Retinal Specializations in the Vertebrate Eye"

Panels

Panelist — Dec-2016
BioTech Connection Los Angeles, UCLA

Panelist — Jun-2016
MedTech-World Conference EAST, New York City, NY
"Making Sense of Big Data: Determining Actionable Data & Your Roadmap for Utilization (II)"

Panelist — Feb-2016
Annual Medical Device & Manufacturer - MedTech-World Conference WEST, Anaheim, CA
"Making Sense of Big Data: Determining Actionable Data & Your Roadmap for Utilization (I)"

Corporate Presentations

Eli Lilly and Company Headquarters, Indianapolis, IN — May-2014
"Big Data Analytics in Post-Market Surveillance and Pharmacological Vigilance"

Workshops Led

Invited Speaker — Jul-2018
Keck Graduate Institute, *IndustryTalk*, Claremont CA
"Artificial intelligence as a competitive strategy in biotech"

Workshop Speaker — Aug-2016
Summer School in Computational Sensory-Motor Neuroscience, Minneapolis, MN

PharmaPack North America Conference — Jun-2014
"Driving Pharmaceutical Product Design with Consumer Intelligence"

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Professional Engagement

Journal Reviewer

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

Professional Mentoring

Mentor, Children's Hospital of Los Angeles' Center for Innovation

Society Memberships

Finance Chair, Society for Brain Mapping and Therapeutics, US-USC Chapter
Member, Society for Neuroscience
Member, Society for Integrative and Comparative Biology
Member, Southwestern Regional Meeting of Organismal Biologists
Member, HPC Technical Computing Advisory Panel