

Curriculum Vitae

March 30, 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

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| Ph.D. Computer Science, Viterbi Dean's Doctoral Fellowship <i>University of Southern California</i> | <i>2015-Present</i> |
| Graduate Certificate - Health Technology and Engineering <i>University of Southern California</i> | <i>2019</i> |
| Masters Degree - Computer Science <i>University of Southern California</i> | <i>2018</i> |
| B.A. with Honors - Computational Biology <i>Pitzer College</i> | <i>2014</i> |

Current Research Support

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| National Science Foundation Graduate Research Fellowship (GRFP) PI: Brian A. Cohn, M.S. | <i>2017-2020</i> |
| Consortium for Technology & Innovation in Pediatrics (CTIP) An FDA-Funded Medical Technology Accelerator Co-PIs: Brian A. Cohn, M.S. , Christopher Laine, Ph.D. | <i>2019-2020</i> |
| USC Marshall School of Business Incubator: Incubated Venture Co-PIs: Brian A. Cohn, M.S. , Dr. Kenneth Hayashida, M.D. | <i>2020</i> |

Industry Experience

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| Microsoft Research <i>Redmond, Washington</i> <ul style="list-style-type: none">• EPIC (Extended Perception Interaction and Cognition) with Mar Gonzalez-Franco• Culminated in a peer-reviewed full-length article accepted to IEEEVR 2020. <i>Tools: Unity, C#, R, Python, Bash, Hololens 2, and Vive Pro</i> | <i>June 2019 - Present</i> Doctoral Research Intern |
| Toyota Motor Sales <i>Torrance, California</i> <ul style="list-style-type: none">• 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. <i>Tools: AWS mTurk, Scala, Python, R</i> | <i>January 2015 - April 2015</i> Consultant to |
| Eli Lilly and Company <i>Indianapolis, Indiana</i> <ul style="list-style-type: none">• 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. <i>Tools: AWS, Python, scikit-learn, and R</i> | <i>September 2013 - May 2014</i> Consultant to |

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*)."
The Anatomical Record, 2016. 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

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

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| 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 |

Awards and Distinctions

Major Awards

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| 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

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| 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 |
| 1 st Prize, Amazon Alexa Voice Prize Competition - USC Viterbi | Mar-2019 |
| 2 nd 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 |
| 3 rd Place, Oral Presentations. 6 th 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 |
| 2 nd 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

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| \$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

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| \$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 |

Conference Presentations

Peer Reviewed Abstracts

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| South West Regional Meeting of Organismal Biologists SICB, UC Irvine, CA <i>"Analytics for tendon-driven robotic limb endpoint force production"</i> | Oct-2017 |
| 37th Annual International IEEE Engineering in Medicine and Biology Society, Milan Italy <i>"Structure of the set of feasible neural commands for complex motor tasks"</i> | Aug-2015 |
| National Society for Integrative and Comparative Biology, Austin TX <i>"Influence of Zooplanktivory on Retinal Ganglion Cell Topography in Labrid Reef Fishes"</i> | Jan-2014 |

Symposia

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| 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

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| 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

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| 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, Accessibility, 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

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| 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 | |

Academic Lectures

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| Invited <i>IndustryTalk</i> Keck Graduate Institute, Corporate Partnerships "The Use of Virtual Reality Platforms for Clinical Applications" | Oct-2018 |
| Invited <i>IndustryTalk</i> Keck Graduate Institute, Corporate Partnerships "Artificial intelligence as a competitive strategy in biotech" | Jul-2018 |
| Invited Lecturer USC Marshall School of Business, MBA Program "Financial analytics and scalable visualizations in R" | Feb-2016 |
| Invited Lecturer ETH-Zürich Department of Computer Science "Hit-and-Run Sampling of Neuromechanical Polytopes" | May-2015 |
| 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" | Oct-2014 |
| Guest Lecture for Sensory Evolution W.M. Keck Science Department "Retinal Specializations in the Vertebrate Eye" | Apr-2014 |

Panels

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| Panelist BioTech Connection Los Angeles, UCLA | Dec-2016 |
| Panelist MedTech-World Conference EAST, New York City, NY "Making Sense of Big Data: Determining Actionable Data & Your Roadmap for Utilization (II)" | 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 (I)" | Feb-2016 |

Corporate Presentations

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

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| Invited Speaker Keck Graduate Institute, <i>IndustryTalk</i> , Claremont CA "Artificial intelligence as a competitive strategy in biotech" | Jul-2018 |
| Workshop Speaker Summer School in Computational Sensory-Motor Neuroscience, Minneapolis, MN | Aug-2016 |
| PharmaPack North America Conference "Driving Pharmaceutical Product Design with Consumer Intelligence" | Jun-2014 |

Professional Engagement

Journal Reviewer

Nature, Scientific Reports
Elsevier, Journal of Biomechanics

Jul-2018 - Current
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