

Curriculum Vitae

December 20, 2021

Professional Areas

National Science Foundation Graduate Fellow, focused on studying neuromechanics of vertebrates and robots, application of AI, VR, and AR to clinical exam-room and ambulance environments, strategic biotech consulting to Fortune 10 and 500 companies for 7 years, design and fabrication of scientific signal-processing electronics and mobile robots. Leading research & development for a clinical research organization (CRO) across FDA-regulated clinical trials for medical devices and pharmaceutical therapeutics. Leadership and management of a scientific and technical research team.

Academic Summary

| | |
|---|-------------|
| Ph.D. - Computer Science, Viterbi Dean's Merit Fellowship <i>University of Southern California</i> | <i>2020</i> |
| Graduate Certificate in Health Technology and Engineering <i>University of Southern California, Viterbi School of Engineering</i> | <i>2019</i> |
| M.S. - Computer Science <i>University of Southern California</i> | <i>2018</i> |
| B.A. with Honors - Computational Biology <i>Pitzer College</i> | <i>2014</i> |

Active Research Support

| | |
|--|------------------|
| https://viterbiinnovation.usc.edu/mousetrap-fund/ Co-PIs: Valero-Cuevas FJ and Cohn BA | <i>2020-2021</i> |
| National Science Foundation Graduate Research Fellowship (GRFP) PI: Cohn BA | <i>2017-2020</i> |
| Consortium for Technology & Innovation in Pediatrics (CTIP) An FDA-Funded Medical Technology Accelerator Co-PIs: Cohn BA and Laine, CM | <i>2019-2021</i> |
| USC Marshall School of Business Incubator: Incubated Venture Co-PIs: Cohn BA , Dr. Kenneth Hayashida, M.D. | <i>2020</i> |

Experience

ObvioHealth

New York City, New York

January 2021 - Present

Director of Research

- Responsible for R&D technical development, hiring, and strategic partnerships for research at ObvioHealth, a Clinical Research Organization (CRO)
- Managing a multidisciplinary research and technical team to implement new digital instruments for sponsored clinical trials.
- Establishing strategic partnerships with hospital networks, nonprofits, and technology companies in the US, APAC, the EU and Sub-Saharan Africa.
- Instantiated the ObvioHealth capstone program and led a team of 9 undergraduate, graduate, and medical school students.

Microsoft Research

Redmond, Washington

June 2019 - August 2019

Doctoral Research Intern

- EPIC (Extended Perception Interaction and Cognition) with [Mar Gonzalez-Franco](#)
- Culminated in two peer-reviewed full-length papers in [IEEE-VR 2020](#) and [IEEE-AIVR 2020](#).

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

Toyota Motor Sales

Torrance, California

January 2015 - April 2015

Consultant to

- Identified root-cause 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 over 10k ‘Mechanical Turkers’ to label data.

Tools: Scala/Spark, AWS mTurk/boto, Python, R

Eli Lilly and Company

Indianapolis, Indiana

September 2013 - May 2014

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

Peer-Reviewed Journal Articles

- "Enjoyable Physical Therapy Experience with Interactive Drawing Games in Immersive Virtual Reality" 2021
SUI '21: Symposium on Spatial User Interaction
Baron L, Wang Q, Segear S, **Cohn BA**, Kim K, Barmaki R
- "Temporal Control of Muscle Synergies is Linked with Alpha-band Neural Drive" 2021
Cover Article Journal of Physiology
Laine CM, **Cohn BA**, Valero-Cuevas FJ
- "SnapMove: Movement Projection Mapping in Virtual Reality" 2020
Proceedings of IEEE AIVR
Cohn BA, Maselli A, Ofek E, Gonzalez-Franco M
- "The Self-Avatar Follower Effect in Virtual Reality" 2020
IEEE Conference on Virtual Reality and 3D User Interfaces
Gonzalez-Franco M, **Cohn BA**, Ofek E, Burin D
- "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

- "Simulating clinical confidence intervals for black-box algorithmic predictions of liver steatosis" 2020
Hepatology 2020.72;1(Suppl):943A (Abstract 1553)
Cohn BA Munteanu MC, de Ledinghen V, Safadi R, Pavlov C, Gonzalo T, Quiambao R
- "Evaluating serum biomarkers: LiverFAST surrogates of liver fibrosis and steatosis could identify risks in a clinical population experiencing SARS-COV2 infection (COVID)" 2020
Hepatology 2020.72;1(Suppl):273A (Abstract 435)
Raskin M Syed S, Corbett E, Sharak Z, Managadze G, Munteanu M, **Cohn B**, Gonzalo T, Amiel R, Quiambao R, Alam I.
- "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

Whitepapers

"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

Clinical study in motor planning across health and disease PI: **Cohn BA**, Co-PI: Kenneth Hayashida, M.D. Active IRB: USC-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 Grant2

Adventure Biofeedback A choose-your-own-adventure style game to provide voice therapy treatment for Cerebral Palsy patients

Co-I's: **Cohn BA**, Laine CM

Kleo Dextrous control of a bio-inspired tendon-driven robot — Responsibilities: Transfer Learning and Data Acquisition

Collaborators: Marjaninejad A, Urbina-Meléndez D, Valero-Cuevas FJ

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 |

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 |
| 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

| | |
|--|----------|
| \$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 |

Compute 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 |

Conference Presentations

Peer Reviewed Abstracts

| | |
|--|----------|
| <i>"Extracting muscle-to-force properties across arbitrary tendon-driven limbs"</i> South West Regional Meeting of Organismal Biologists SICB, UC Irvine, CA | Oct-2017 |
| <i>"Analytics for tendon-driven robotic limb endpoint force production"</i> 37th Annual International IEEE Engineering in Medicine and Biology Society, Milan Italy | Aug-2015 |
| National Society for Integrative and Comparative Biology, Austin TX <i>"Structure of the set of feasible neural commands for complex motor tasks"</i> | Jan-2014 |
| <i>"Influence of Zooplanktivory on Retinal Ganglion Cell Topography in Labrid Reef Fishes"</i> Regional Society for Integrative and Comparative Biology, UC Riverside, CA | Oct-2013 |

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

| | |
|---|----------|
| <i>"Inter-rater variability of the Bristol Stool Scale on diapered stool"</i> North American Society for Pediatric Gastroenterology, Hepatology and Nutrition, | Dec-2021 |
| Drug Information Association Global Annual Meeting 2021, "Automatic Image Segmentation to Pre-process Pediatric Stool Photos", Jun-2021 | |
| Drug Information Association Global Annual Meeting 2021, "Clinician Versus Caregiver Ratings of Pediatric Stool Consistency", Jun-2021 | |
| 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

| | |
|---|----------|
| Talk: 5th Annual Virtual Reality and Healthcare Global Symposium, Online | Mar-2021 |
| Talk: Unity for Humanity Summit, San Francisco CA | Oct-2020 |
| 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

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 composed of 2-8 undergraduate students

Academic Guest 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-Zürich 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 Talks

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"

Professional Engagements

Scientific Advisory Board Member

ARK Venture Capital,
ObvioHealth Inc

Aug-2020 - Current
June-2020 - Current

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