

## Curriculum Vitae

December 17, 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

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

### Active Research Support

<a href="https://viterbiinnovation.usc.edu/mousetrap-fund/">https://viterbiinnovation.usc.edu/mousetrap-fund/</a> Co-PIs: Valero-Cuevas FJ and <b>Cohn BA</b>	<i>2020-2021</i>
National Science Foundation Graduate Research Fellowship (GRFP) PI: <b>Cohn BA</b>	<i>2017-2020</i>
Consortium for Technology & Innovation in Pediatrics (CTIP) An FDA-Funded Medical Technology Accelerator Co-PIs: <b>Cohn BA</b> and Laine, CM	<i>2019-2021</i>
USC Marshall School of Business Incubator: Incubated Venture Co-PIs: <b>Cohn BA</b> , 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*)."
- 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   <b>Recipient</b>	Mar-2017
National Science Foundation Graduate Research Fellowship   <b>Honorable Mention</b>	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 <sup>st</sup> Prize, Amazon Alexa Voice Prize Competition - USC Viterbi	Mar-2019
2 <sup>nd</sup> 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 <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
Young Investigator Award, Alternative Muscle Club & Genera Biocells, San Diego, CA	Sep-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
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***"Inter-rater variability of the Bristol Stool Scale on diapered stool"*

North American Society for Pediatric Gastroenterology, Hepatology and Nutrition, Dec-2021

*"Clinician Versus Caregiver Ratings of Pediatric Stool Consistency"*

DIA, Jun-2021

*"Automatic Image Segmentation to Preprocess Pediatric Stool Photos"*

DIA, Jun-2021

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 &amp; 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**

DIA Global Annual Meeting 2021, "Automatic Image Segmentation to Preprocess Pediatric Stool Photos", Jul-2021

DIA Global Annual Meeting 2021, "Clinician Versus Caregiver Ratings of Pediatric Stool Consistency", Jul-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