

John D. Simeral

Curriculum Vitae

February 2025

Current Positions

Assistant Professor of Engineering (Research)
School of Engineering
Brown University

Research Biomedical Engineer
Center for Neurorestoration and Neurotechnology
VA Rehabilitation R&D Service
VA Providence Healthcare System

Contact

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Web site <https://vivo.brown.edu/display/jsimeral>

Education

B.S. **Electrical Engineering** Stanford, CA
Stanford University, June 1985
M.S. **Electrical & Computer Engineering** Austin, TX
University of Texas at Austin, December 1989
Thesis advisor: Dr. AJ Welch
Thesis Title: *Monitoring and controlling surgical temperatures during laser angioplasty using infrared feedback*
Ph.D. **Neuroscience** Winston-Salem, NC
Wake Forest University School of Medicine, June 2003
Dissertation advisor: Dr. SA Deadwyler
Dissertation Title: *Neural coding and dynamics in the rat hippocampus*

Academic Appointments

1994 **Lecturer** San Diego, CA
Dept. of Electrical and Computer Engineering
University of California San Diego
1996 – 2003 **Doctoral Student** Winston-Salem, NC
Dept. of Physiology and Pharmacology (Dr. Sam Deadwyler)
Wake Forest University School of Medicine
2003-2009 **Postdoctoral Research Fellow** Providence, RI
Dept. of Neuroscience (Dr. John Donoghue)
Brown University
2006-2008 **Research Scientist** Providence, RI
Rehabilitation R&D Service
Dept. of Veterans Affairs Providence Healthcare System
2009-present **Research Biomedical Engineer** Providence, RI
Rehabilitation R&D Service
Center for Neurorestoration and Neurotechnology
Dept. of Veterans Affairs Providence Healthcare System

2010-present **Assistant Professor (Research)** Providence, RI
School of Engineering
Brown University

Industry Positions

1986-1987 **Research Assistant**, VLSI multichip module development Austin, TX
Microelectronics and Computer Technology Corporation (MCC)

1987-1990 **Engineer**, Custom VLSI CPU design Rancho Bernardo, CA
NCR Corp.

1990-1993 **Principal Engineer**, Memory subsystem and ASIC VLSI design Torrey Pines, CA
Teradata and NCR Joint Development Organization

1993-1995 **Sr. Principal Engineer**, Massively parallel systems development Rancho Bernardo, CA
AT&T Corp., Global Information Solutions

Consulting

2006 **Consultant**, Neural Engineering Foxborough, MA
Cyberkinetics Neurotechnology Systems, Inc.

Teaching

1985-1986 **University of Texas at Austin**
Dept. of Electrical and Computer Engineering
Electronics Laboratory (Teaching Assistant).
Administered and graded multiple weekly electronics labs in an 18-lab
engineering core course for Electrical & Computer Engineering seniors

1994 **University California San Diego**
Dept. of Electrical & Computer Engineering
Microelectronic System Design (Fall)
28 lecture course, assignments and tests for ECE / EE seniors

2005-2007 **Brown University** School of Medicine
Neuroanatomy (Spring)
Lectures and gross anatomy lab (80 1st-year medical students, 3-4 lectures, 2 labs)

2007 **Brown University** Dept. of Neuroscience
Neurotechnology (Fall)
Lecture

2006, 2007 **Brown University** Dept. of Neuroscience
Cognitive Neuroscience (BN166, Spring)
Lecture

2007-2010 **Brown University** Dept. of Biology
Biomaterials (Bio 112, Spring)
Lecture

2018 **Brown University** Dept. of Computer Science
Creating modern web applications (CS 132, Spring)
Faculty advisor for semester-long group projects in web development

2020 **Brown University** School of Engineering
Neuroengineering (ENGR 1220, Spring)
Lecture

- 2021 **Brown University** Division of Biology
From Neurons to Consciousness (NEUR 1500, for MA in Biology, Spring)
 Lecture
- 2015, '17-'24 **Brown University** School of Engineering
Transforming Society – Technology and Choices for the Future (ENGN 0020, Spring)
 Lecture

Research Grants and Fellowships

Current support

- 2024 – 2028 Dept. Veterans Affairs Merit Review Award, A4820-R (Hochberg, PI)
Rapid neural typing interface for Veterans with ALS
 \$2,285,578 (Total award, 4 years)
 CO-INVESTIGATOR
- 2023 – 2026 CDMRP AL220043 (Stavisky, PI - UC Davis)
Brain-computer interface for voice synthesis in people with ALS
 \$290,741 (Total site award to Brown, 3 years)
 PRINCIPAL INVESTIGATOR on subcontract to Brown
- 2022 – 2026 Dept. Veterans Affairs Merit Review Award, A3803-R (Simeral, PI)
Enhancement and optimization of a mobile iBCI for Veterans with paralysis
 \$1,198,474 (Total award to Providence VA, 4 years)
 PRINCIPAL INVESTIGATOR
- 2021 - 2026 NIH-NIDCD, U01DC019430 (Henderson, PI - Stanford)
Single-neuron population dynamics in human motor cortex for a speech prosthesis
 \$317,241 (Total site award to Brown, 5 years)
 PRINCIPAL INVESTIGATOR on subcontract to Brown
- 2021 - 2026 NIH-NINDS, U01NS123101 (Henderson, PI - Stanford)
Cortical basis of complex motor sequences in humans for neural interfaces
 \$1,140,876 (Total site award to Brown, 5 years)
 PRINCIPAL INVESTIGATOR on subcontract to Brown
- 2020 - 2025 NIH-NIDCD, R01DC014034 (Henderson & Shenoy, PIs - Stanford)
Engaging new cognitive and motor signals to improve communication prostheses
 \$162,110 (Total site award to Brown, 5 years)
 PRINCIPAL INVESTIGATOR on subcontract to Brown
- 2019 - 2025 NIH-NIDCD , U01DC017844 (Hochberg, PI)
Intuitive, complete neural control of tablet computers for communication
 \$4,030,513 (Total, 5 years; extension)
 NAMED INVESTIGATOR

Proposals pending

None.

Proposals submitted / in submission

Dept. Veterans Affairs Merit Review Award (Simeral, PI)
Transforming BCIs for Veterans with paralysis – empowering independent use
\$1,199,528 (Total award to VA Providence Healthcare System, 4 years)
PRINCIPAL INVESTIGATOR

Completed support

- 2024 SPRINT Undergraduate Teaching and Research Award (summer)
C programming for a Linux ARM processor for the BrainGate BCI
FACULTY ADVISOR for Brown undergraduate awardee Damir Kulzhanov
- 2023 Undergraduate Teaching and Research Award (summer)
Computer modeling of intracortical neural signals
FACULTY ADVISOR for Brown undergraduate awardee Natalie Herrick
- 2020 - 2022 NIH-NINDS, U24NS113637-01A1 (Starr, PI – UCSF & Borton, PI - Brown)
Accelerating dissemination of implantable neurotechnology for clinical research
\$835,000 (Total site award to Brown, 5 years)
NAMED INVESTIGATOR
- 2020 - 2022 ALSA, 20-MALS-553 (Hochberg, PI)
Enabling independent home use of an intracortical Brain-Computer Interface for control of multiple communication devices.
\$200,000 (Total, 2 years)
NAMED INVESTIGATOR
- 2019 - 2022 AHA 19SCLOI34780000 (Hochberg & Walsh, PIs)
Intracortical control of soft robotics for restoration of hand function after stroke
\$227,361 (Total site award to Brown, 3 years)
NAMED INVESTIGATOR
- 2019 - 2021 DoD CDMRP-SCIRP, SC180308 (Ajiboye, PI)
Restoring multi-dimensional reaching and dexterous grasping to persons with chronic tetraplegia through Functional Electrical Stimulation
\$72,933 (Total site award to Brown, 2 years)
PRINCIPAL INVESTIGATOR on subcontract to Brown
- 2018 - 2023 Dept. Veterans Affairs Merit Review Award, A2827-R (Simeral, PI) (NCE)
Deployment of a mobile broadband BCI
\$1,200,810 (Total, 4 years)
PRINCIPAL INVESTIGATOR
- 2018 - 2022 VA Ctr. for Neurorestoration & Neurotech., Seed Grant (Simeral & Paradiso, PIs)
Development and Testing of an Intelligent Visual Prosthesis
\$55,402 (Total, 3 years)
CO-PRINCIPAL INVESTIGATOR
- 2017 VA SHEEP REQUEST (Hochberg, PI - VA)
ShEEP request to upgrade the InMotion upper extremity interactive therapy system
\$119,000
NAMED INVESTIGATOR
- 2017 NIDCD/BRCP ADMINISTRATIVE SUPPLEMENT, (Hochberg & Simeral, Co-PIs - Brown)

- Maintaining communication: Implanted brain-computer interfaces for people with ALS
 \$25,642
 CO-INVESTIGATOR
- 2016 - 2020 NINDS, U01NS098968 (CASH, PI)
Understanding the neural basis of volitional state through continuous neural recordings
 \$510,132 (total subcontract direct costs, 3 years)
 NAMED INVESTIGATOR (SUBCONTRACT TO BROWN)
- 2015 - 2021 NIH-NINDS, UH2NS095548 (Nurmikko & Hochberg, PIs) [NCE]
High-Bandwidth Wireless Interfaces for Continuous Human Intracortical Recording
 \$5,784,249 (total, 3 years)
 NAMED INVESTIGATOR (SUBCONTRACT TO BROWN)
- 2015 - 2020 NIH-NIDCD, R01DC014034 (Henderson, PI - Stanford)
Advanced neural decoders for communication interfaces
 \$203,400 (total subcontract directs, 5 years + NCE)
 PRINCIPAL INVESTIGATOR ON SUBCONTRACT TO BROWN
- 2015 - 2016 Conquer Paralysis Now foundation grant (Simeral, PI - Brown)
Preclinical testing of a high-performance wireless neural interface for individuals with SCI
 \$50,000 (total, 1 year)
 PRINCIPAL INVESTIGATOR
- 2015 VA Center for Neurorestoration and Neurotechnology, Seed Funding (Simeral, PI)
Haptics integration for neural control of assistive robotic arms by humans with paralysis.
 \$57,820
 PRINCIPAL INVESTIGATOR
- 2014 - 2018 DEPT. VETERANS AFFAIRS MERIT REVIEW AWARD, P1155R (Simeral, PI)
Mobile signal processing system for broadband neural decoding
 \$1,058,343 (total, 4 years)
 PRINCIPAL INVESTIGATOR
- 2014 - 2017 NIH-NICHD, R01 HD077220 (Kirsch, PI - Case Western)
Intracortical control of FES-restored arm and hand function in people with SCI
 \$394,578 (subcontract direct costs, 4 years)
 INVESTIGATOR (SUBCONTRACT TO BROWN)
- 2014 - 2016 General Electric Collaboration GEGR (Donoghue, PI)
Electrode evaluation - phase 1
 \$112,686 (total)
 NAMED INVESTIGATOR
- 2012 Karen T. Romer Undergraduate Teaching and Research Award
 W and F Hewlett Research Collaboration
Alternative methods for state decoding of neural signals
 \$7500
 FACULTY ADVISOR for Brown undergraduate awardee Matteson
- 2011 - 2016 Dept. of Veterans Affairs, Rehabilitation R&D Service, A6779I (Simeral, PI)
 Merit Review Award
Direct intracortical control of a multijoint prosthetic arm

- \$1,945,112 (total, 5 years)
PRINCIPAL INVESTIGATOR
- 2011 Karen T. Romer Undergraduate Teaching and Research Award
W and F Hewlett Research Collaboration
Computer modeling of intracortical neural signals
\$7,500
FACULTY ADVISOR for Brown undergraduate awardee Anish Sarma
- 2009 - 2017 NIH-NIDCD R01 DC009899 (Hochberg, PI - MGH)
Restoring communication with an intracortical neural interface system
\$369,687 (subcontract direct costs, FY 2016)
INVESTIGATOR (SUBCONTRACT TO BROWN)
- 2008 - 2015 Dept. of Veterans Affairs, Rehabilitation R&D Service, B6453R (Hochberg, PI)
Merit Review Award
Feasibility of the BrainGate system for Veterans with ALS
\$544,755
RESEARCH BIOMEDICAL ENGINEER
- 2008 - 2014 NIH-NCMRR, NICHD, N01 HD53403 (Kirsch, PI)
Controller development for upper limb movement
\$82,344
INVESTIGATOR (SUBCONTRACT TO BROWN)
- 2003 - 2005 NIMH Postdoctoral Research Fellowship, T32 MH19118
Brown University
POST-DOCTORAL FELLOW
- 1997 - 2000 NIMH pre-doctoral Individual NRSA, F31 MH11989
Wake Forest University Graduate School of Arts and Sciences
Nonlinear systems analysis of hippocampal neuronal ensembles.
\$82,344
PRE-DOCTORAL FELLOW
- 1996 - 1997 Graduate Training Fellowship
Wake Forest University Graduate School of Arts and Sciences
\$72,000
GRADUATE FELLOW

Honors and Awards

Patents / patent applications

- 1990 Sanwo IJ, **Simeral JD**, Daniel RA. *ECL-to-CMOS Converter*. USA #4,888,501.
- 1992 Sanwo IJ, **Simeral JD**, Daniel RA. *ECL-to-CMOS Converter*. Canada #1,304,459.
- 2015 Nurmikko AV, Heelan CD, Borton DA, Komar J, Rosler D, **Simeral JD**. *System and Methods for Mobile Medical Monitoring*. US2015/025595.
- 2021.11.01 Hochberg LR, **Simeral JD**, Hosman T, Singer-Clark T, Gross R, Kapitonava A. *Brain computer interface (BCI) system that can be implemented on multiple devices*. United States Patent #11,972,050. [issued 2024.04.30]
- 2022.12.06 **Simeral JD**, Hosman T, Vargas-Irwin C, Thengone D, Hochberg LR, Singer-Clark T, Gross R, Kapitonava A. *Providing mental control of position and/or gesture controlled technologies via intended postures*. United States Patent Application #18/075,811. Priority date 12/6/2021. [pending]

- 2023.11.13 Hochberg LR, Hosman T, Gusman J, **Simeral JD**, Vargas-Irwin C. *A novel method for decoding sustained grasps for use in intracortical brain-computer interfaces*. United States Patent Application #18/946,156. Filed 11/13/24. Priority date 11/13/23. [pending]
- 2024.11.14 Hochberg LR, Lütsch Espinosa SE, Hosman T, Rosler D, **Simeral JD**, Vargas-Irwin C, Herrick N. *A novel method for achieving high accuracy typing on a virtual keyboard using an intracortical Brain Computer Interface*. United States Patent Application #18/947,556. Priority date 11/14/2023. [pending]

Research

- 2008 **Highlights of 2008 Collection** awarded by Journal of Neural Engineering “Neural control of computer cursor velocity by decoding motor cortical spiking activity in humans with tetraplegia,” Kim S-P, Simeral JD, Hochberg LR, Donoghue JP and Black MJ. *J. Neural Eng.* 5(4):455-476, Dec 2008.
- 2011 Senior Membership of the IEEE awarded.
- 2011 **Most cited paper for 2010-2011 (top 10)**. *Journal of Neural Engineering*, for Simeral et al. (2011) “Neural control of cursor trajectory and click by a human with tetraplegia 1000 days after implant of an intracortical microelectrode array”. *Journal impact factor of 3.837, ranked 5th of 72 biomedical engineering journals on ISI.*
- 2011 **Highlights of 2011 Collection** awarded by *Journal of Neural Engineering* for Simeral et al. (2011) publication “Neural control of cursor trajectory and click by a human with tetraplegia 1000 days after implant of an intracortical microelectrode array”, based on ‘the highest praise from our international referees and the highest number of downloads.’
- 2012 **Finalist, Annual g-tec BCI Award 2012** for “Intracortical control of assistive devices by individuals with tetraplegia.”
- 2012 **Herbert Pardes Clinical Research Excellence Award, 2012**, by Massachusetts General Hospital for “Reach and grasp by people with tetraplegia using a neurally-controlled robotic arm.” *Nature*, 2012, for most outstanding clinical research achievement of 2012.
- 2012 **Most cited papers for 2011-2012 (top 10)**. *Journal of Neural Engineering*, for Simeral et al. (2011) “Neural control of cursor trajectory and click by a human with tetraplegia 1000 days after implant of an intracortical microelectrode array”. *Journal impact factor of 3.837, ranked 5th of 72 biomedical engineering journals on ISI.*
- 2012 **Martin Research Prize for Excellence in Basic Research, 2012**, by Massachusetts General Hospital for “Reach and grasp by people with tetraplegia using a neurally-controlled robotic arm,” *Nature*, 2012.
- 2013 **Israel Brain Technologies B.R.A.I.N. prize** international competition. Co-awardee with D. Rosler, A. Nurmikko, J. Donoghue and L. Hochberg. \$1,000,000.
- 2014 **Business Insider** online video story covering BrainGate research (interview)
- 2018 **The Economist** online video story covering BrainGate research (filmed interview)
- 2018 **1st Prize, Annual BCI Society Award 2018** for “Restoring functional reach-to-grasp in a person with chronic tetraplegia using implanted functional electrical stimulation and intracortical brain-computer interfaces.” (awarded with co-authors).

- 2024 **Top 3 finalist, Brown University Innovation of the Year**, for "Virtual Keyboard for Use with an Intracortical Brain-Computer Interface" (with co-patent applicants)
- 2024 **Sean M. Healey International Prize for Innovation in ALS.** "Celebrating excellence in research for a team of investigators who catalyze exceptional discoveries leading to a transformative advance in therapy development in ALS." One of 12 Principal Investigators in the BrainGate Consortium receiving this award. Presented at the 35th International Symposium on ALS/MND in Montreal, Quebec.

Service to the Profession

Executive Leadership

- 2015-pres Executive Council Member, VA Center for Neurorestoration and Neurotechnology
 2015-pres Focus Area Leader, Focus Area on Restoring Communication and Mobility, VA Center for Neurorestoration and Neurotechnology, Providence, RI

Society Service & Conference Organization

- 2006 Founding member, IEEE EMBS, Providence Chapter
 2011 Session Organizer and Co-Chair, Neural Engineering Track, BMES Annual Meeting, Hartford, CT, Biomedical Engineering Society, 2011.
 2015 Founding member, international BCI Society, Netherlands
 2016 Workshop Chair and Organizer, 6th Int'l BCI Meeting, Asilomar / Pacific Grove, CA
 "Pathways to effective BCI communication and computer interaction for people with disability"
 2019 Invited participant, NIH Conference: SCI 2020: Launching a Decade for Disruption in Spinal Cord Injury Research (co-sponsored by NINDS, NCMRR, NICHD), Rockville, MD, Feb 12-13, 2019.
 2023 Workshop Planning Committee, 9th Int'l BCI Meeting, Brussels, Belgium. June 6-9, 2023.
 "Technological development and implementation of BCIs for home use"

Standards Development / Regulatory

- 2016 Participant in NIH Workshop on Standards and Modularity of Brain-Computer Interfaces and Neuroprostheses
 2017 Educator, FDA Experiential Learning Program, FDA field trip to BrainGate trial

Reviewer (grants)

- Previous Natural Sciences and Engineering Research Council of Canada (NSERC)
 American Institute of Biological Sciences
 US Army Medical Research and Materiel Command (USAMRMC)
 Lifespan
 Wellcome Trust
 American Institute of Biological Sciences (AIBS)
 NINDS: Special Emphasis Panel, "NINDS Exploratory Clinical Trials (R01)"
 2020- Natural Sciences and Engineering Research Council of Canada (NSERC),
 Veterans Administration Technology Transfer BRAVE Award Program

Reviewer (journal manuscripts)

- Previous: Science Translational Medicine
 Journal of Neural Engineering
 Neural Information Processing Systems (NIPS)
 Neuron

2020- Annals of Neurology
Neurocomputing Review
Frontiers in Neuroscience
Neurobiology of Disease
Journal of Neuroscience Methods
IEEE Transactions on Biomedical Circuits and Systems
Neurorehabilitation and Neural Repair

Reviewer (conference abstracts)

Biomedical Engineering Society (BMES)
BCI Society

Society Memberships

1988-2007 Member, IEEE
1999-2010 American Association for the Advancement of Science, member (AAAS)
2007-2012 Biomedical Engineering Society, member (BMES)
1996-pres Member, Society for Neuroscience (SfN)
1996-pres Engineering in Medicine and Biology Society, member (IEEE EMBS)
2007-pres Senior Member, IEEE
2015-pres Founding Member, BCI Society, Netherlands

Service to the University

2012 Speaker, Alumni Networking & Recruiting Event, School of Engineering, Brown University, Providence, RI
2014 Exhibit organizer, Brown University 250th Anniversary Research Day (Interactive public Robotics exhibit at Sydney Frank Hall)
2023 Exhibit organizer, Brain Fair, Brown University (Interactive Brain-computer interface exhibit, ERC)
2025- Member, BME master's program Advisory Board
2025- Application Reviewer, BME master's program

Service to the Community

2009 Keynote speaker, North Country Access Disabled Sports USA, Clayton, NY
2012 Invited speaker, Everett Company, Granoff Center for the Creative Arts, Providence, RI
2014 Television and radio community service programs and community outreach spotlighting BrainGate research (associated with keynote talk at Spinal Cord Injury Network, Sydney, Australia:

- ABC News 24 TV, "Morning News" with Andrew Geoghegan and Eliza Harvey
- Radio 2BG 873 AM, "Life and Technology" with Warren Moore
- Radio 2UE, "Healthy Living" with Dr. Ross Walker

)
2014 Keynote speaker, Spinal Cord Injury Network, Sydney, Australia.
2016 Keynote speaker, 22nd Annual Brain Injury Symposium, Baptist Hospital Rehabilitation Center, Miami, FL
2017 Panelist, "Advances and Future Outlook in Neuroscience" Rhode Island MedMates Life Sciences Expo 2017, Providence, RI

- 2017 Keynote Speaker, 28th International Symposium on ALS/MND
 “The innovation landscape in ALS/MND: Beyond Pharmacotherapies”
 Westin Waterfront Hotel, Boston, MA
- 2018 Lecturer, 2018 Translational Neuroscience and Neural Engineering Workshop
 Salve Regina University, Newport, RI
- 2019 Live radio Skype interview for BBC World News TV story, “Paralysis of Thought”
 for BBC’s Asia-facing news service (BBC Singapore)

Student Advising – Brown University

Undergraduate Advising

- 2005 Aaron Gliberman, Division of Engineering
 Undergraduate summer research, Brown University
 CO-MENTOR (with LR Hochberg)
- 2009 Jacob Donoghue, Dept. of Neuroscience
 ASSISTANT MENTOR for Senior Honors Thesis
- 2010-2012 Anish Sarma, School of Engineering
 FACULTY MENTOR, Junior year EE research project
 ADVISOR, UTRA award for undergraduate training
 THESIS ADVISOR, Senior Research Thesis:
 “Simulation and extraction of control-signal features from field
 potential oscillations in human motor cortex.”
- 2012-2014 Evan Matteson, School of Engineering
 UNDERGRADUATE RESEARCH ADVISOR
- 2013 ADVISOR, UTRA award for undergraduate training
 “Exploration of alternative methods for state decoding of neural signal
- 2013 ADVISOR, INDEPENDENT STUDY (ENGN 1970):
 “A method of inferring intended position and velocity from closed-
 loop data for calibration of an intracortical brain computer
 interface.”
- 2012-2014 James Besancon, School of Engineering
 THESIS ADVISOR, Senior Honors Thesis in Engineering:
 “Kinematic structures for the DEKA arm: A framework for shared control.”
- 2014-2015 Daniel Milstein, School of Engineering
 FACULTY MENTOR & READER (with Erik Sudderth), Senior Research Thesis:
 “Assumed density filtering for neural decoding.”
- 2017-2018 Alexander Lo, Biomedical Engineering
 THESIS ADVISOR, Senior Honors Thesis in Biomedical Engineering:
 “Longitudinal analysis of neural units as recorded by a multielectrode array.”
- 2018-2019 Zoe Beckman, Biomedical Engineering
 UNDERGRADUATE RESEARCH ADVISOR, Sophomore
 “Analysis of human cortical neuronal activity tracked over months and years.”
- 2018-2019 Annabelle Iserson, Biological Sciences
 THESIS ADVISOR, Senior Honors Thesis in Health & Human Biology (AB):
 “Developing methods to deploy and assess BCI technology for individuals with
 paralysis in their homes.”

- 2019 Pablo Soler-Portilla, Electrical Engineering
ADVISOR, junior-year Independent Study in Engineering:
"iBCI using embedded hardware"
- 2019 Alexander Reuter, School of Engineering
MENTOR, summer internship (rising sophomore):
"Configuring Zynq embedded systems for real-time BCI"
- 2022 Christopher Schiff, School of Engineering
MENTOR, summer internship (rising senior):
"Translating Simulink models to FPGA logic for embedded BCI processing"
- 2023 - Natalie Herrick, School of Engineering (BME)
MENTOR, undergraduate research ('23 - '25)
MENTOR, UTRA award for undergraduate training (summer '23 , rising junior):
"Deploying experiments for onscreen 10-digit BCI typing with tetraplegia"
ADVISOR, Engineering Independent Study (ENGN 1970, fall '24)
"Assistive virtual typing using mixed gesture decoding in an intracortical BCI"
ADVISOR, Senior Thesis ('24 - '25)
"Multi-gesture neural decoding deployed in an intracortical BCI"
- 2024 Damir Kulzhanov, Physics & Computer Engineering
ADVISOR, summer SPRINT (rising senior)
"C programming for a Linux ARM processor for the BrainGate BCI"
ADVISOR, INDEPENDENT STUDY / SENIOR CAPSTONE (ENGN 1972):
"Software for an embedded Bluetooth system for mobile assistive BCI"
- 2025 - Sarah Richman, Applied Math & Computer Science
ADVISOR, INDEPENDENT STUDY (ENGN 1971):
"ARM real-time data streaming in a an embedded hybrid SoC"

Graduate Student Advising (Sc.M.)

- 2014-2015 James Besancon, Engineering
THESIS ADVISOR (5TH year ScM)
"Using virtual robot experimentation platform (V-REP) to enable shared control of
a robotic arm via brain-computer interface"
(Project Engineer, Bloomy, industrial automation, Windsor, CT)
- 2014-2016 Jose Albites Sanabria, Biomedical Engineering
MENTOR & THESIS COMMITTEE MEMBER (ScM) (Advisor: Leigh Hochberg)
"BrainGate-enabled intracortical neural control of commercial tablet computers
by individuals with tetraplegia."
(Founding Partner and Manager, Lima Bionics. Peru, 2016)
(Professor, National University of Engineering, Lima, Peru 2018)
- 2015-2017 Johnny Ciancibello, Biomedical Engineering
THESIS ADVISOR (ScM)
"Improving real-time classification methods for an intracortical brain-computer
interface in humans"
(The Feinstein Institute for Medical Research: Center for Bioelectronic Medicine)
(Account manager, home medical supplier Sentido Health, Denver, CO)
- 2016-2017 Daniel Milstein, Computer Science
THESIS PROJECT MENTOR, THESIS COMMITTEE MEMBER (ScM) (Adv: Erik Sudderth)
"Assumed density filtering for neural decoding"
(Software programmer, Harvard Med. Sch.; graduate student, UMass Amherst C.S.)

- 2018-2019 Shirin Tooloee, Biomedical Engineering
 THESIS ADVISOR (5th year ScM)
 “Understanding How Cognitive Deficits Influence Motor Recovery in Patients with Acute Ischemic Stroke”
 (Clinical engineer for Robotics Solutions, Johnson & Johnson)
- 2022-2024 Stefan Lütschg Espinosa, Biomedical Engineering
 THESIS ADVISOR (SCM)
 “Development of a 10-digit BCI neural typing interface for people with tetraplegia”
- 2023-2024 Yuan Cao, Electrical and Computer Engineering
 RESEARCH ADVISOR (SCM)
 “Developing real-time data streams for an ARM embedded BCI system”
 (Notre Dame PhD program in Electrical Engineering, starting fall 2024)
- 2023 - Qiwu Zhang, Electrical and Computer Engineering
 THESIS ADVISOR (SCM, *in progress*)
 “Design and synthesis of FPGA logic for embedded BCI neural signal processing”
- 2024-2025 Zeming Liu, Biomedical Engineering
 THESIS READER (ScM) (advisor Wilson Truccolo)
 “Parameter optimization for noninvasively-induced electric fields in pediatric tDCS”
- 2024 - Claire Nicolas, Biomedical Engineering
 THESIS ADVISOR (SCM, *in progress*)
 “BCI-enabled 3D virtual computing on a wearable headset for individuals with tetraplegia” (*planning stage*)
- 2024 - Yishu Li, Biomedical Engineering
 THESIS ADVISOR (SCM, *in progress*)
 “Leveraging stable neural manifolds for high-performance multi-gesture BCI decoding” (*planning stage*)

Graduate Student Advising (Ph.D.)

- 2013-2018 Chris Heelan, Electrical Engineering
 THESIS CO-ADVISOR (PhD) (with Arto Nurmikko)
 “Mobile electronics for medical prosthetic applications.”
 (Machine learning lead at investments company GMO, Boston, MA)
- 2022-2024 Mona Khoshnevis, Applied Math
 THESIS READER (PhD) (advisor Matt Harrison)

Technical Staff Trainees

- 2007-2009 Katherine Centrella Newell Clinical Neurotechnology Research Asst., BrainGate project
 (Emory School of Medicine, MD)
 Emergency Medicine Physician, Pinehurst, NC
- 2007-2010 Sergey Stavisky Software/Hardware Engineer, BrainGate project
 (Stanford PhD program in Eng; now faculty at UC Davis)
- 2009-2012 Erin Gallivan Oakley Clinical Neurotechnology Research Asst., BrainGate project
 (USC Keck School of Medicine, MD)
 (Emergency Medicine Resident, Boston Medical Center)
- 2009-2014 Dan Bacher Software/Hardware Engineer, BrainGate project
 (Ximeda, medical device consulting)

		(Founder, Speak Your Mind Foundation) (VP of R&D, Celero Systems)
2010-2011	Etsub Berhanu	Neurotechnology Research Asst., BrainGate project (US Patent Office)
2011-2014	Nick Schmansky	Mass. Gen. Hosp. Software Engineer, BrainGate project (Continued at MGH: PI for software commercialization SBIR)
2012-2013	Kathryn Tringale	Clinical Neurotechnology Research Asst., BrainGate project (UCSD School of Medicine, MD, then Radiation Oncology Res., Mem. Sloan Kettering Cancer Ctr)
2012-2015	Anish Sarma	Software/Hardware Engineer, BrainGate project (Cal Tech PhD program in Comp. & Neural Sys)
2012-2014	Brittany Sorice	Clinical Neurotechnology Research Asst., BrainGate project (Speech & Language Pathology program at B.U.)
2013-2015	James Besancon	Engineering summer intern (2013), BrainGate (Project Engineer, Bloomy, industrial automation)
2013-2018	Jad Saab	Systems Engineer, BrainGate project (Insight Data Science, New York City)
2016-2020	Jessica Kelemen	Clinical Neurotechnology Research Asst., BrainGate project (MIT Sloan School of Management)
2017-2018	Benjamin Shanahan	Software Engineer, BrainGate project (Software Engineer, NeuroPace (2018-'20); SpaceX ('20+))
2017-2018	Jannis Brea	User Experience UX Designer, BrainGate project (MD program, Feinberg School of Medicine, Northwestern)
2019-2022	Tyler Singer-Clark	Software Engineer, BrainGate project (U.C. Davis Neuroscience PhD program, 2022+)
2015-2023	Tommy Hosman	Systems Engineer, BrainGate project (Combined Berkeley-UCSF graduate program)
2020-2024	Ronnie Gross	UI/UX Design Engineer, BrainGate project [Georgia Inst. Tech. Masters Program in Computer Science]
2021-2023	Rekha Crawford	Research Engineer, BrainGate project ADVISOR, Brown PREP program, 2022-2023 (accepted, Emory PhD program in neuroengineering)
2022-	Shane Allcroft	Systems Engineer, BrainGate project
2024-	Andrew Dempsey	Systems Engineer, BrainGate project

Publications

Book Chapters

- [1] **Simeral JD**, Hampson RE, Deadwyler SA. Behaviorally relevant neural codes in hippocampal ensembles: Detection on single trials. In Synaptic Plasticity: From Basic Mechanisms To Clinical Applications. eds. Baudry M and Schreiber S) (Cambridge: MIT Press) pp 459-476. 2005. ISBN: [9780429113789](#)
- [2] Hampson RE, **Simeral JD**, Deadwyler SA. Cognitive processes in replacement brain parts: A code for all reasons. In Toward Replacement Parts for the Brain. eds. Berger TW and Glanzman DL (Cambridge: MIT Press) pp 111-128, 2005. [MIT Press](#)
- [3] Hampson RE, **Simeral JD**, Berger TW, Song D, Chan RH, Marmarelis VZ, Deadwyler SA. Cognitively relevant recording in hippocampus: Beneficial feedback of ensemble codes in a closed-loop paradigm. In Electrophysiological Recording Techniques (Neuromethods), vol.

54. eds. Vertes RP and Stackman RW Jr (Totowa: Humana Press) pp 215-239. 2008. doi: [10.1007/978-1-60327-202-5_9](https://doi.org/10.1007/978-1-60327-202-5_9)
- [4] Vogel J, Haddadin S, **Simeral JD**, Stavisky SD, Bacher D, Hochberg LR, Donoghue JP, van der Smagt P. Continuous control of the DLR light-weight robot III by a human with tetraplegia using the BrainGate2 neural interface system. In *Experimental Robotics (Springer Tracts in Advanced Robotics)*, vol. 79. eds. Khatib O, Kumar V and Sukhatme G. (Springer-Verlag, Berlin Heidelberg) pp 125-136. 2014. [Springer](https://doi.org/10.1007/978-1-4419-9811-1_10)
- [5] Milstein D, Pacheco J, Hochberg LR, **Simeral JD**, Jarosiewicz B, Sudderth EB. Multiscale Semi-Markov Dynamics for Intracortical Brain-Computer Interfaces. In *Advances in Neural Information Processing Systems 30 (NIPS 2017)*, eds. Guyon I, Luxburg UV, Bengio S, Wallach H, Fergus R, Vishwanathan W and Garnett R. 2017. [pdf](https://arxiv.org/abs/1706.03380)

Refereed journal articles

- [1] Sanwo IJ, **Simeral JD**, Milby GH. High-Speed ECL-to-CMOS and CMOS-to-ECL Converters. *NCR Journal*, 4(2):10-16, 1990.
- [2] Hampson RE, **Simeral JD**, Deadwyler SA. Distribution of spatial and nonspatial information in dorsal hippocampus. *Nature*, 402:610-614, 1999. doi: [10.1038/45154](https://doi.org/10.1038/45154)
- [3] Hampson RE, **Simeral JD**, Deadwyler SA. What ensemble recordings reveal about functional hippocampal cell encoding. *Progress in Brain Research*, 130:345-57, 2001. doi: [10.1016/S0079-6123\(01\)30023-7](https://doi.org/10.1016/S0079-6123(01)30023-7)
- [4] Hampson RE, **Simeral JD**, Deadwyler SA. "Keeping on track": firing of hippocampal neurons during delayed-nonmatch-to-sample performance. *J Neuroscience* 22:RC198, 2002. doi: [10.1523/JNEUROSCI.22-02-j0002.2002](https://doi.org/10.1523/JNEUROSCI.22-02-j0002.2002)
- [5] Hampson RE, **Simeral JD**, Kelly EJ, Deadwyler SA. Tolerance to the memory disruptive effects of cannabinoids involves adaptation by hippocampal neurons. *Hippocampus*. 13:543-556, 2002. doi: [10.1002/hipo.10081](https://doi.org/10.1002/hipo.10081)
- [6] Song Y-K, Patterson WR, Bull CW, Beals J, Hwang N, Deangelis AP, Lay C, McKay JL, Nurmikko AV, Fellows MR, **Simeral JD**, Donoghue JP, Connors BW. Development of a chip-scale integrated microelectrode/microelectronic device for brain implantable neuroengineering applications. *IEEE Trans Neural Systems and Rehabilitation Engineering*, 13(2):220-226, 2005. doi: [10.1109/TNSRE.2005.848337](https://doi.org/10.1109/TNSRE.2005.848337)
- [7] Donoghue JP, Hochberg LR, Nurmikko AV, Black MJ, **Simeral JD**, Friehs G. Neuromotor Prosthesis Development. *Med Health RI*, 90(1):12-15, 2007. PMID: [17487029](https://pubmed.ncbi.nlm.nih.gov/17487029/), [pdf](https://doi.org/10.1007/s12020-007-0011-1)
- [8] Song YK, Patterson WR, Bull CW, Borton DA, Li Y, Nurmikko AV, **Simeral JD**, Donoghue JP. A brain implantable microsystem with hybrid RF/IR telemetry for advanced neuroengineering applications. *Conf. Proceedings of the IEEE Engineering in Medicine and Biology Society*, 2007, 445-8, 2007. doi: [10.1109/IEMBS.2007.4352319](https://doi.org/10.1109/IEMBS.2007.4352319)
- [9] Kim S-P, **Simeral JD**, Hochberg LR, Donoghue JP, Friehs GM, Black MJ. Multi-state decoding of point-and-click control signals from motor cortical activity in a human with tetraplegia. *Proceedings of the IEEE Engineering in Medicine and Biology International Conference on Neural Engineering*, 486-89, 2007. doi: [10.1109/CNE.2007.369715](https://doi.org/10.1109/CNE.2007.369715), [pdf](https://arxiv.org/abs/0708.0001)
- [10] Song YK, Patterson WR, Bull CW, Borton DA, Nurmikko AV, **Simeral JD**, Donoghue JP. A neural interface microsystem with all optical telemetry for brain implantable neuroengineering applications. *Conference on Lasers and Electro-Optics*. CThG4. 4-9 May, 2008. doi: [10.1109/CLEO.2008.4551410](https://doi.org/10.1109/CLEO.2008.4551410)

- [11] Kim S-P, **Simeral JD**, Hochberg LR, Donoghue JP, Black MJ. Neural control of computer cursor velocity by decoding motor cortical spiking activity in humans with tetraplegia. *J. Neural Engineering* 5(4):455-76, 2008. doi: [10.1088/1741-2560/5/4/010](https://doi.org/10.1088/1741-2560/5/4/010)
- [12] Song YK, Borton DA, Park S, Patterson WR, Bull CW, Laiwalla F, Mislow J, **Simeral JD**, Donoghue JP, Nurmikko AV. Active microelectronic neurosensor arrays for implantable brain communication interfaces. *IEEE Trans Neural Systems and Rehabilitation Engineering*, 17(4):339-45, 2009. doi: [10.1109/TNSRE.2009.2024310](https://doi.org/10.1109/TNSRE.2009.2024310)
- [13] Kim S-P, **Simeral JD**, Hochberg LR, Donoghue JP, Black MJ. Computer control by motor cortical signals in humans with tetraplegia. *Asian Control Conference, 2009. ASCC 2009*. 7th 27-29 Aug. 988-93, 2009. [ResearchGate](https://www.researchgate.net/publication/220141100)
- [14] Vogel J, Haddadin S, **Simeral JD**, Stavisky SD, Bacher D, Hochberg LR, Donoghue JP, van der Smagt P. Continuous control of the DLR Light-Weight Robot III by a human with tetraplegia using the BrainGate2 neural interface system. *International Symposium on Experimental Robotics (ISER2010)*, Delhi, India, 2010. doi: [10.1007/978-3-642-28572-1_9](https://doi.org/10.1007/978-3-642-28572-1_9), pdf
- [15] Kim S-P, **Simeral JD**, Hochberg LR, Donoghue JP, Friehs GM, Black MJ. Point-and-click cursor control with an intracortical neural interface system in humans with tetraplegia. *IEEE Trans. Neural Systems and Rehabilitation Engineering*, 19(2):193-203, 2011. doi: [10.1109/TNSRE.2011.2107750](https://doi.org/10.1109/TNSRE.2011.2107750)
- [16] **Simeral JD**, Kim S-P, Black MJ, Donoghue JP, Hochberg LR. Neural control of cursor trajectory and click by a human with tetraplegia 1000 days after implant of an intracortical microelectrode array. *J. Neural Engineering*, 8(2):025027, 2011. doi: [10.1088/1741-2560/8/2/025027](https://doi.org/10.1088/1741-2560/8/2/025027)
- [17] Chadwick E, Blana D, **Simeral JD**, Lambrecht J, Cornwell A, Taylor D, Hochberg LR, Donoghue JP, Kirsch R. Continuous neuronal ensemble control of simulated arm reaching by a human with tetraplegia. *J. Neural Engineering*, 8(3):034003, 2011. doi: [10.1088/1741-2560/8/3/034003](https://doi.org/10.1088/1741-2560/8/3/034003)
- [18] Hochberg LR, *Bacher D., *Jarosiewicz B, *Masse NY, ***Simeral JD**, Vogel J, Haddadin S, Liu J, Cash SS, van der Smagt P, Donoghue JP. Reach and grasp by people with tetraplegia using a neurally-controlled robotic arm. *Nature*, 485(7398):372-375, 2012. doi: [10.1038/nature11076](https://doi.org/10.1038/nature11076)
- [19] Ajiboye AB, **Simeral JD**, Donoghue JP, Hochberg LR, Kirsch RF. Prediction of imagined single-joint movements in a person with high level tetraplegia. *IEEE Trans Biomedical Engineering*, 59(10):2755-65, 2012. doi: [10.1109/TBME.2012.2209882](https://doi.org/10.1109/TBME.2012.2209882)
- [20] Thompson DE, Quitadamo LR, Mainardi L, Laghari KUR, Gao S, Kindermans PJ, **Simeral JD**, Fazel-Rezai R, Matteucci M, Falk TH, Bianchi L, Chestek CA, Huggins JE. Performance measurement for brain-computer or brain-machine interfaces: A tutorial. *J. Neural Engineering*, 11(3):035001, 2014. doi: [10.1088/1741-2560/11/3/035001](https://doi.org/10.1088/1741-2560/11/3/035001)
- [21] Masse NY, Jarosiewicz B, **Simeral JD**, Bacher D, Stavisky SD, Cash SS, Oakley EM, Berhanu E, Eskandar E, Friehs G, Hochberg LR, Donoghue JP. Non-causal spike filtering improves decoding of movement intention for intracortical BCIs. *J Neurosci Methods*, 236:58-67, 2014. doi: [10.1016/j.jneumeth.2014.08.004](https://doi.org/10.1016/j.jneumeth.2014.08.004)
- [22] Bacher D, Jarosiewicz B, Masse NY, Stavisky SD, **Simeral JD**, Newell K, Oakley EM, Cash SS, Friehs G, Hochberg LR. Neural point-and-click by a person with incomplete locked-in syndrome. *Neurorehabilitation and Neural Repair*, 29:462-71, 2015. doi: [10.1177/1545968314554624](https://doi.org/10.1177/1545968314554624)

- [23] Vogel J, Haddadin S, **Simeral JD**, Bacher D, Jarosiewicz B, Hochberg LR, Donoghue JP, van der Smagt P. An assistive decision-and-control architecture for force-sensitive hand-arm systems driven by human-machine interfaces. *Intl. J. of Robotics Research*, 34(6): 763-780, 2015. doi: [10.1177/0278364914561535](https://doi.org/10.1177/0278364914561535)
- [24] Gilja V*, Pandarinath C*, Blabe CH, Nuyujukian P, **Simeral JD**, Sarma AA, Sorice BL, Perge JA, Jarosiewicz B, Eskandar EN, Hochberg LR, Shenoy KV**, Henderson JM**. Clinical translation of a high performance neural prosthesis. *Nature Medicine* 21:1142-1145, 2015. doi: [10.1177/0278364914561535](https://doi.org/10.1177/0278364914561535)
- [25] Jarosiewicz B, Sarma AA, Bacher D, Masse NY, **Simeral JD**, Sorice B, Oakley EM, Blabe C, Pandarinath C, Gilja V, Cash SS, Eskandar E, Friehs G, Henderson JM, Shenoy KV, Donoghue JP, Hochberg LR. Virtual typing by people with tetraplegia using a self-calibrating intracortical brain-computer interface. *Science Translational Medicine*, 7(313):313ra179, 2015. doi: [10.1126/scitranslmed.aac7328](https://doi.org/10.1126/scitranslmed.aac7328)
- [26] Heelan C, Komar J, Vargas-Irwin CE, **Simeral JD**, Nurmikko AV. A mobile embedded platform for high performance neural signal computation and communication. *IEEE Biomedical Circuits and Systems Conference (BioCAS) 2015*. Atlanta, GA. 2015. doi: [10.1109/BioCAS.2015.7348356](https://doi.org/10.1109/BioCAS.2015.7348356)
- [27] Willett FR, Pandarinath C, Jarosiewicz B, Murphy BA, Memberg WD, Blabe CH, Saab J, Walter BL, Sweet JA, Miller JP, Henderson JM, Shenoy KV, **Simeral JD**, Hochberg LR, Kirsch RF, Ajiboye AB. Feedback control policies employed by people using intracortical brain-computer interfaces. *J. Neural Engineering* 14(1):016001, 2017. doi: [10.1088/1741-2560/14/1/016001](https://doi.org/10.1088/1741-2560/14/1/016001)
- [28] Huggins JE, Guger C, Ziat M, Zander TO, Taylor D, Tangermann M, Soria-Frisch A, **Simeral JD**, Scherer R, Rupp R, Ruffini G, Robinson DKR, Ramsey NF, Nijholt A, Muller-Putz G, McFarland DJ, Mattia D, Lance BJ, Kindermans P-J, Iturrate I, Herff C, Gupta D, Do AH, Collinger JL, Chavarriaga R, Chase SM, Bleichner MG, Batista A, Anderson CW, Aarnoutse EJ. Workshops of the sixth brain-computer interface meeting: Brain-Computer Interfaces past, present, and future. *Brain-Computer Interfaces*, 4(1-2): 2017. doi: [10.1080/2326263X.2016.1275488](https://doi.org/10.1080/2326263X.2016.1275488)
- [29] Ajiboye AB, Willett FR, Young DR, Memberg WD, Murphy BA, Miller JP, Walter BL, Sweet JA, Hoyer HA, Keith MW, Peckham PH, **Simeral JD**, Donoghue, JP, Hochberg LR, Kirsch RF. Restoration of reaching and grasping movements through brain-controlled muscle stimulation in a person with tetraplegia: a proof-of-concept demonstration. *The Lancet*, 389(10081):1821-1830. 2017. doi: [10.1016/S0140-6736\(17\)30601-3](https://doi.org/10.1016/S0140-6736(17)30601-3)
- [30] Willett FR, Murphy BA, Memberg WD, Blabe CH, Young D, Jarosiewicz B, Pandarinath C, Franco B, Saab, J, Walter BL, Sweet JA, Miller JP, Henderson JM, Shenoy KV, **Simeral JD**, Hochberg LR, Kirsch RF, Ajiboye A. A comparison of intention estimation methods for decoder calibration in intracortical brain-computer interfaces. *IEEE Trans. Biomedical Eng.*, 65(9):2066-2078. 2018. doi: [10.1109/TBME.2017.2783358](https://doi.org/10.1109/TBME.2017.2783358)
- [31] Brandman DM, Hosman T, Saab J, Burkhart MC, Shanahan BE, Ciancibello JG, Sarma AA, Milstein DJ, Vargas-Irwin CE, Franco B, Kelemen J, Blabe C, Murphy BA, Young DR, Willet FR, Pandarinath C, Stavisky SD, Kirsch RF, Walter BL, Ajiboye AB, Cash SS, Eskandar EN, Miller JP, Sweet JA, Shenoy KV, Henderson JM, Jarosiewicz B, Harrison MT, **Simeral JD**, Hochberg LR. Rapid calibration of an intracortical brain computer interface for people with tetraplegia. *J. Neural Engineering*, 15(2): 026007, 2018. doi: [10.1088/1741-2552/aa9ee7](https://doi.org/10.1088/1741-2552/aa9ee7)
- [32] Milekovic T, Sarma AA, Bacher D, **Simeral JD**, Saab J, Pandarinath C, Sorice BL, Blabe C, Oakley EM, Tringale KR, Eskandar E, Cash SS, Henderson JM, Shenoy KV, Donoghue JP, Hochberg LR. Stable long-term BCI-enabled communication in ALS and locked-in syndrome using LFP signals. *J. Neurophysiol.*, 120:343-360. 2018. doi: [10.1152/jn.00493.2017](https://doi.org/10.1152/jn.00493.2017)

- [33] Vargas-Irwin CE, Feldman JM, King B, **Simeral JD**, Sorice BL, Oakley EM, Cash S, Eskandar EN, Friehs GM, Hochberg LR, Donoghue JP. Watch, imagine, attempt: motor cortex single unit activity reveals context-dependent movement encoding in humans with tetraplegia. *Front. Hum. Neurosci.*, 12:450. 2018. doi: [10.3389/fnhum.2018.00450](https://doi.org/10.3389/fnhum.2018.00450)
- [34] Nuyujukian P, Albites Sanabria J, Pandarinath C, Saab J, Jarosiewicz B, Blabe CH, Franco B, Mernoff S, Eskandar EN, **Simeral JD**, Hochberg LR, Shenoy KV, Henderson JM. Cortical control of a tablet computer by people with paralysis. *PLoS One*, 13(11):e0204566. 2018. doi: [10.1371/journal.pone.0204566](https://doi.org/10.1371/journal.pone.0204566)
- [35] Milekovic T, Bacher D, Sarma AA, **Simeral JD**, Saab J, Pandarinath C, Yvert B, Sorice BL, Blabe C, Oakley EM, Tringale KR, Eskandar E, Cash SS, Shenoy KV, Henderson JM, Hochberg LR, Donoghue JP. Volitional control of single-electrode high gamma local field potentials by people with paralysis. *J. Neurophysiol.*, 121:1428-1450. 2019. doi: [10.1152/jn.00131.2018](https://doi.org/10.1152/jn.00131.2018)
- [36] Hosman T, Vilela M, Milstein D, Kelemen JN, Hochberg LR, **Simeral JD**. BCI decoder performance comparison of an LSTM recurrent neural network and a Kalman filter in retrospective simulation. *2019 9th International IEEE/EMBS Conference on Neural Engineering (NER)*, San Francisco, CA, USA. pp. 1066-1071. 2019. doi: [10.1109/NER.2019.8717140](https://doi.org/10.1109/NER.2019.8717140)
- [37] Willet FR, Young DR, Murphy BA, Memberg D, Blabe CH, Pandarinath C, Stavisky SD, Rezaii P, Saab J, Walter BL, Sweet JA, Miller JP, Henderson JM, Shenoy KV, **Simeral JD**, Jarosiewicz B, Hochberg LR, Kirsch RF, Ajiboye B. Principled BCI decoder design and parameter selection using a feedback control model. *Scientific Reports*, 9:8881. 2019. doi: [10.1038/s41598-019-44166-7](https://doi.org/10.1038/s41598-019-44166-7)
- [38] Thengone, DJ, Hosman T, **Simeral JD**, Hochberg LR. Auditory-reliant intracortical brain-computer interfaces for effector control by a person with tetraplegia. In: Stephanidis C, Antona M, Ntoa S (eds) *HCI International 2020. Communications in Computer and Information Science*, vol 1294. Springer, Cham. doi: [10.1007/978-3-030-60703-6_13](https://doi.org/10.1007/978-3-030-60703-6_13)
- [39] Hosman T, Hynes JB, Saab J, Wilcoxon KG, Buchbinders BR, Schmansky N, Cash SS, Eskandar EN, **Simeral JD**, Franco B, Kelemen J, Vargas-Irwin CE*, Hochberg LR*. Auditory cues reveal intended movement information in middle frontal gyrus neuronal ensemble activity of a person with tetraplegia. *Scientific Reports*, 11:98. 2021. doi: [10.1038/s41598-020-77616-8](https://doi.org/10.1038/s41598-020-77616-8)
- [40] **Simeral JD**, Hosman T, Saab J, Flesher SN, Vilela M, Franco B, Kelemen J, Brandman DM, Ciancibello JG, Rezaii PG, Eskandar EN, Rosler DM, Shenoy KV, Henderson JM, Nurmikko AV, Hochberg LR. Home use of a percutaneous wireless intracortical brain-computer interface by individuals with tetraplegia. *IEEE Trans. Biomed. Eng.* 68(7):2313-2325. 2021. doi: [10.1109/TBME.2021.3069119](https://doi.org/10.1109/TBME.2021.3069119)
- [41] Rubin DB, Hosman T, Kelemen JN, Kapitonava A, Willett FR, Coughlin BF, Halgren E, Kimchi EY, Williams ZM, **Simeral JD**, Hochberg LR, Cash SS. Learned motor patterns are replayed in human motor cortex during sleep. *J. Neurosci.* 42(25):5007-5020. 2022. doi: [10.1523/JNEUROSCI.2074-21.2022](https://doi.org/10.1523/JNEUROSCI.2074-21.2022)
- [42] Rubin DB **et al.** Interim safety profile from the feasibility study of the BrainGate neural interface system. *Neurology*. Jan 13:10.1212/WNL.0000000000201707. 2023. doi: [10.1212/WNL.0000000000201707](https://doi.org/10.1212/WNL.0000000000201707)
- [43] Hosman T, Pun Tsam K, Kapitonava A, **Simeral JD**†, Hochberg LR†. Months-long high-performance fixed LSTM decoder for cursor control in human intracortical brain-computer interfaces. *2023 11th International IEEE EMBS Conference on Neural Engineering (NER)*, Baltimore, MD, USA. pp 1-5. 2023. <https://doi.org/10.1109/NER52421.2023.10123740>

- [44] Herron J, Kremen V, **Simeral JD**, Dawes H, Worrell G, Starr PA, Denison T, Borton D. The convergence of neuromodulation and brain-computer interfaces. *Nat. Rev. Bioeng.* 2024. doi: [10.1038/s44222-024-00187-0](https://doi.org/10.1038/s44222-024-00187-0)
- [45] Pun TK, Khoshnevis M, Hosman T, Wilson GH, Kapitonava A, Kamdar F, Henderson JM, **Simeral JD**, Vargas-Irwin CE, Harrison MT, and Hochberg LR. Measuring instability in chronic human intracortical neural recordings towards stable, long-term brain-computer interfaces. *Nat. Comm. Bio.* 2024. (in press) [bioRxiv doi: [10.1101/2024.02.29.582733](https://doi.org/10.1101/2024.02.29.582733)]
- [46] Gusman JT, Hosman T, Crawford R, Singer-Clark T, Kapitonava A, Kelemen JN, Hahn N, Henderson JM, Hochberg LR, **Simeral JD**, Vargas-Irwin CE. Multi-gesture drag-and-drop decoding in a 2D iBCI control task. (accepted)

Preprint articles (not yet peer reviewed)

- [47] Vargas-Irwin C, Hosman T, Gusman JT, Pun TK, **Simeral JD**, Kapitonava A, Nicolas C, Shah NP, Avansino D, Kamdar F, Williams Z, Henderson JM, Hochberg LR. Gesture Encoding in human left precentral gyrus neuronal ensembles. bioRxiv, 2024. doi: [10.1101/2024.08.23.608325](https://doi.org/10.1101/2024.08.23.608325)

Submitted manuscripts

- [48] Wilson GH, Stein EA, Kamdar F, Avansino DT, Pun TK, Gross R, Hosman T, Singer-Clark T, Kapitonava A, Hochberg LR, **Simeral JD**, Shenoy KV, Druckmann S, Henderson JM, Willett FR. Long-term unsupervised recalibration of cursor BCIs. *Nature Biomed. Eng.* (in review)
- [49] Vargas-Irwin C, Hosman T, Gusman JT, Pun TK, **Simeral JD**, Kapitonava A, Nicolas C, Shah NP, Avansino D, Kamdar F, Williams Z, Henderson JM, Hochberg LR. Gesture Encoding in human left precentral gyrus neuronal ensembles. *Nat. Comm. Bio.* (in review)

Abstracts

- [1] **Simeral JD**, Hampson RE, Deadwyler SA. Derivation of spatial vs temporal connectivity from population analyses in ensembles of hippocampal neurons. *Society for Neuroscience Abstracts*, 24:758.2, 1998.
- [2] **Simeral JD**, Pons TP, Yen Y-F, Hernandez L, Hampson RE, Deadwyler SA. Comparison of independent component analysis (ICA) and statistical parametric mapping (SPM) procedures in an fMRI visual activation study. In: *Proceeding of the International Society for Magnetic Resonance in Medicine*, 7th Annual Meeting, Philadelphia, 1999.
- [3] Pons TP, **Simeral JD**, Yen Y-F, Hernandez L, Hampson RE, Deadwyler SA. Independent components analysis of functional MRI during visual & motor activations: derivation of variance sources and comparison with statistical parametric mapping. *Society for Neuroscience Abstracts*, 25(1):1137, 1999.
- [4] **Simeral JD**, Hampson RE, Deadwyler SA. Derivation of task-relevant ensemble codes on single delayed-nonmatching-to-sample trials. *Society for Neuroscience Abstracts*, 25(2):1386, 1999.
- [5] **Simeral JD**, Hampson RE, Deadwyler SA. Derivation of task-relevant ensemble codes on single delayed-nonmatching-to-sample trials. *Western North Carolina Society for Neuroscience Annual Meeting*, 1999.
- [6] Deadwyler SA, Jordan ER, **Simeral JD**, Smulders TV, Hampson RE. Tolerance to, and precipitated withdrawal from, chronic cannabinoid effects on memory are reflected in task-

- relevant encoding by ensembles of hippocampal neurons. Program No. 773.13. Neuroscience 2000 Abstracts. New Orleans, LA: *Society for Neuroscience*, 2000. Online.
- [7] **Simeral JD**, Hampson RE, Deadwyler SA. Neural encoding in rat hippocampus and associated structures during short-term memory of images in a visual delayed match-to-sample task. Program No. 171.11. Neuroscience 2000 Abstracts. New Orleans, LA: *Society for Neuroscience*, 2000. Online.
- [8] Hampson RE, **Simeral JD**, Deadwyler SA. Information content analysis reveals a functional linkage between hippocampal and subicular neurons during the delay of DNMS trials. Program No. 173.8. Neuroscience 2000 Abstracts. New Orleans, LA: *Society for Neuroscience*, 2000. Online.
- [9] **Simeral JD**, Hampson RE, Deadwyler SA. Characterization of single-trial hippocampal ensemble codes in rats performing a delayed nonmatch-to-sample task. Program No. 953.13. Neuroscience 2001 Abstracts. San Diego, CA: *Society for Neuroscience*, 2001. Online.
- [10] **Simeral JD**, Deadwyler SA, Hampson RE. Coding and theta modulation in hippocampal interneurons during delayed nonmatch-to-sample. Program No. 477.4. Neuroscience 2002 Abstracts. Orlando, FL: *Society for Neuroscience*, 2002. Online.
- [11] Deadwyler SA, West CL, Morgan AR, Ramirez S, Konstantopoulos JK, **Simeral JD**, Hampson RE. Monitoring of online hippocampal neural activity for closed-loop control of memory dependent performance. Program No. 518.11. Neuroscience 2003 Abstracts. New Orleans, LA: *Society for Neuroscience*, 2003. Online.
- [12] **Simeral JD**, Dushanova JA, Donoghue JP. Encoding of wrist and arm movements by simultaneously-recorded populations of neurons in MI motor cortex of monkeys. Program No. 872.17. Neuroscience 2004 Abstracts. San Diego, CA: *Society for Neuroscience*, 2004. Online.
- [13] Dushanova JA, **Simeral JD**, Donoghue JP. Task related changes in neuronal ensembles in motor cortex of monkeys during arm and wrist tracking. Program No. 872.16. Neuroscience 2004 Abstracts. San Diego, CA: *Society for Neuroscience*, 2004. Online.
- [14] **Simeral JD**, Dushanova JA, Donoghue JP. Effector specificity in the firing activity of simultaneously-recorded neurons in monkey MI during wrist and arm movements. *Neural Control of Movement Annual Meeting*, 2005.
- [15] Serruya MD, Song Y-K, Patterson WR, Bull CW, Nurmikko AV, Fellows MR, **Simeral JD**, Donoghue JP. Development of a brain implantable microsystem with infrared optical telemetry for advanced neuromotor prosthesis. Program No. 148.15. 2006 Neuroscience Meeting Planner. Atlanta, GA: *Society for Neuroscience*, 2006. Online.
- [16] **Simeral JD**, Dushanova JA, Donoghue JP. Wrist and arm movement direction are robustly represented in overlapping populations of monkey MI arm area neurons. Program No. 451.17. 2006 Neuroscience Meeting Planner. Atlanta, GA: *Society for Neuroscience*, 2006. Online.
- [17] Kim S, **Simeral JD**, Donoghue JP, Hochberg LR, Friehs G, Mukand JA, Chen D, Black MJ. A comparison of decoding models for imagined motion from human motor cortex. Program No. 256.11. 2006 Neuroscience Meeting Planner. Atlanta, GA: *Society for Neuroscience*, 2006. Online.
- [18] Kim S-P, **Simeral JD**, Jenkins OC, Donoghue JP, Black MJ. Finding directional movement representations in motor cortical neural populations using nonlinear manifold learning. *World Congress on Medical Physics and Biomedical Engineering*, 2006; Seoul, Korea, 2006.

- [19] Song Y-K, Patterson WR, Bull CW, Nurmikko AV, Fellows MR, **Simeral JD**, Serruya MD, Donoghue JP. Development of an on-chip microelectronic interface for brain implantable neuroengineering applications. BMES Annual Meeting, Chicago, IL. *Biomedical Engineering Society*, 2006.
- [20] Song Y-K, Patterson WR, Bull CW, Borton DA, Laiwalla FL, Nurmikko AV, **Simeral JD**, Donoghue JP. Development of a wireless brain implantable microsystem for primates with hybrid RF-IR telemetry. Program No. 624.7. 2007 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2007. Online.
- [21] **Simeral JD**, Kim S-P, Black MJ, Donoghue JP, Hochberg LR. Ensemble spiking activity as a source of cortical control signals in individuals with tetraplegia. BMES Annual Fall Meeting, Hollywood, CA. *Biomedical Engineering Society*, 2007.
- [22] Donoghue JP, **Simeral JD**, Kim S-P, Friehs GM, Bouton CE, Masters MT, Hochberg LR, Black MJ. Toward standardized assessment of pointing devices for brain-computer interfaces. Program No. 517.16. 2007 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2007. Online.
- [23] **Simeral JD**, Kim S-P, Donoghue JP, Black MJ, Friehs GM, Brown RH Jr., Krivickas LS, Hochberg LR. Directional tuning in motor cortex of a person with ALS. Program No. 517.4. 2007 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2007. Online.
- [24] Kim S-P, **Simeral JD**, Hochberg LR, Friehs GM, Donoghue JP, Black MJ. Point-and-click cursor control by a person with tetraplegia using an intracortical neural interface system. Program No. 517.3. 2007 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2007. Online.
- [25] Mislow JM, Song YK, Borton DA, Patterson WR, Bull CW, Park S, **Simeral JD**, Donoghue JP, Nurmikko AV. An implantable brain-computer interface with infrared signal telemetry for neuromotor prosthesis. *Congress of Neurological Surgeons Annual Meeting*: Orlando, FL, 20-25 Sep. 2008.
- [26] Ajiboye B, Taylor DM, **Simeral JD**, Lambrecht JM, Hochberg LR, Donoghue JP, Kirsch RF. Neural signal modulation during single versus multi-degree-of-freedom imagined arm movements in individuals with high tetraplegia. Program No. 673.17. 2008 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience Annual Meeting*, 2008. Online.
- [27] Kim S-P, **Simeral JD**, Hochberg LR, Truccolo W, Donoghue JP, Friehs GM, Black MJ. Tuning analysis of motor cortical neurons in a person with paralysis during performance of visually instructed cursor control tasks. Program No. 673.16. 2008 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2008. Online.
- [28] Hochberg LR, **Simeral JD**, Kim S-P, Stein J, Friehs GM, Black MJ, Donoghue JP. More than two years of intracortically based cursor control via a neural interface system. Program No. 673.15. 2008 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2008 Online.
- [29] Donoghue JP, **Simeral JD**, Black MJ, Kim S-P, Truccolo W, Hochberg LR. Neural activity in the motor cortex of humans with tetraplegia. *AREADNE Conference on Research in Encoding and Decoding of Neural Ensembles*, Santorini, Greece. 26-29 June. 2008.
- [30] **Simeral JD**, Kim S-P, Stavisky SD, Donoghue JP, Hochberg LR. Assessment of BrainGate-enabled neural control of a point-and-click cursor by a person with tetraplegia 1000 days after array implant. Program No. 181.5. 2009 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2009. Online.
- [31] Ajiboye B, Taylor DM, Lambrecht JM, **Simeral JD**, Donoghue JP, Hochberg LR, Kirsch RF. Decoding of endpoint vs joint kinematics during imagined arm movements in individuals

- with high tetraplegia: A BrainGate2 study. Program No. 14.9. 2009 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2009. Online.
- [32] Donoghue JA, **Simeral JD**, Kim S-P, Donoghue JP, Hochberg LR. Intra-day stability of single unit multi-electrode recordings in MI during control of a neural interface system. Program No. 181.3. 2009 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2009. Online.
- [33] Kirsch R, Taylor DM, Chadwick EK, Blana D, Cornwell AS, Lambrecht J, **Simeral JD**, Kim S-P, Hochberg LR, Donoghue JP. Human cortical control of a virtual upper limb functional electrical stimulation system. Program No. 14.10. 2009 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2009. Online.
- [34] Stavisky SD, **Simeral JD**, Kim SP, Centrella KA, Donoghue JP, Hochberg LR. Architecture of the BrainGate neural interface system in the ongoing pilot clinical trial for individuals with tetraplegia. Program No. 181.6. 2009 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2009. Online.
- [35] **Simeral JD**, Stavisky SD, Centrella KA, Donoghue JP, Hochberg LR. Neural control of continuous kinematics and discrete states of assistive devices by a human with tetraplegia four years after implant of the BrainGate intracortical electrode array. *4th International Brain-Computer Interface Conference*, Asilomar, CA. 2010.
- [36] Chadwick EK, Blana D, **Simeral JD**, Donoghue JP, Hochberg LR, Kirsch RF. Human cortical control of a virtual, upper limb, FES system. *1st Annual Conference of the International Functional Electrical Stimulation Society*, Univ. of Salford, UK. 2010.
- [37] Liu J, **Simeral JD**, Stavisky SD, Bacher D, Vogel J, Haddadin S, van der Smagt P, Hochberg LR, Donoghue JP. Control of the DLR light-weight robot III using intracortical motor signals by an individual with tetraplegia in the BrainGate2 trial. Program No. 899.7. 2010 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2010. Online.
- [38] Malik WQ, Stavisky SD, Bacher D, **Simeral JD**, Truccolo W, Brown EN, Donoghue JP, Hochberg LR. Decoding multiunit activity in neural interfaces for individuals with tetraplegia. Program No. 899.3. 2010 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2010. Online.
- [39] **Simeral JD**, Stavisky SD, Bacher D, Centrella KA, Eskandar E, Cash SS, Donoghue JP, Hochberg LR. Developments in the ongoing pilot clinical trial of the BrainGate intracortical neural interface system. Program No. 899.8. 2010 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2010. Online.
- [40] Kim S-P, Tsoli A, Jenkins OC, **Simeral JD**, Donoghue JP. Unsupervised learning of a low-dimensional non-linear representation of motor cortical neuronal ensemble activity using spatio-temporal ISOMAP. Program No. 899.28. 2010 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2010. Online.
- [41] Bacher D, Stavisky SD, **Simeral JD**, Donoghue JP, Hochberg LR. Use of a general-purpose communication interface by an individual with tetraplegia in the BrainGate2 clinical trial. Program No. 899.9. 2010 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2010. Online.
- [42] **Simeral JD**, Stavisky SD, Centrella KA, Donoghue JP, Hochberg LR. Neural control of continuous kinematics and discrete states of assistive devices by a human with tetraplegia four years after implant of the BrainGate intracortical electrode array. *NIH Neural Interfaces Workshop*: Long Beach, CA, 2010.
- [43] Sarma AA, Bacher D, **Simeral JD**. A real-time simulation model of neuronal control in the BrainGate2 Neural Interface System. *UTRA research project program*. Brown University. September, 2011.

- [44] Bacher D, Masse N, Jarosiewicz B, Tringale K, **Simeral JD**, Donoghue JP, Hochberg LR. Toward the development of viable communication interfaces for individuals with locked-in syndrome. *BMES Annual Meeting*, Hartford, CT. Biomed Engineering Society, 2011.
- [45] Masse NY, Vogel J, Bacher D, Jarosiewicz B, Liu J, **Simeral JD**, Hochberg LR, van der Smagt P, Donoghue JP. Multidimensional neural control of the DLR light-weight robot III. Program No. 142.06. 2011 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2011. Online.
- [46] **Simeral JD**, Perge JA, Masse NY, Jarosiewicz B, Bacher D, Donoghue JP, Hochberg LR. Some preliminary longitudinal findings from five trial participants using the BrainGate neural interface system. Program No. 142.04. 2011 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2011. Online.
- [47] Bacher D, Jarosiewicz B, Masse NY, **Simeral JD**, Donoghue JP, Hochberg LR. Neural point-and-click communication by an individual with tetraplegia using the BrainGate intracortical neural interface system five years post-implant. Program No. 142.10. 2011 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2011. Online.
- [48] Donoghue JP, **Simeral JD**, Bacher D, Masse NY, Jarosiewicz B, Hochberg LR. Neural 3-D and grasp control of the DEKA prosthetic arm and hand by an individual with tetraplegia. Program No. 142.19. 2011 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2011. Online.
- [49] **Simeral JD**, Bacher D, Jarosiewicz B, Donoghue JP, Hochberg LR. Assessing reach and grasp with prosthetic and robotic arm / hand systems by people with tetraplegia using the BrainGate neural interface system. Program No. 583.13. 2012 Neuroscience Meeting Planner. New Orleans, LA: *Society for Neuroscience*, 2012. Online.
- [50] Bacher D, Jarosiewicz B, Tringale K, **Simeral JD**, Donoghue JP, Hochberg LR. From BCI to AAC: Toward practical augmentative and alternative communication systems using brain-computer interfaces. Program No. 583.07. 2012 Neuroscience Meeting Planner. New Orleans, LA: *Society for Neuroscience*, 2012. Online.
- [51] Sarma AA, Bacher D, **Simeral JD**, Hochberg LR, Donoghue JP. Spectral and temporal features in beta LFP suppression: Decoding intended movement onset in individuals with tetraplegia. Program No. 583.14. 2012 Neuroscience Meeting Planner. New Orleans, LA: *Society for Neuroscience*, 2012. Online.
- [52] **Simeral JD**, Stavisky SD, Cash SS, Hochberg LR, Donoghue JP. Interpreting BrainGate and NeuroPort intracortical microelectrode array impedances measured in people across months and years. *39th Neural Interfaces Conference*, 2012. Salt Lake City, UT.
- [53] **Simeral JD**, Bacher D, Sarma AA, Schmansky NJ, Stavisky SD, Jarosiewicz B, Milekovic T, Rosler DM, Gilja V, Pandarinath C, Cornwell AS, Henderson JM, Shenoy KV, Kirsch RF, Donoghue JP, Hochberg LR. Evolution of the BrainGate real-time brain-computer interface (BCI) platform for individuals with tetraplegia or limb loss. Program No. 80.02. 2013 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2013. Online.
- [54] Zhang S, **Simeral JD**, Perge JA, Park YS, Hochberg LR, Donoghue JP. Performance evaluation of silicon array in long-term recording with LFP signal. Program No. 80.12. 2013 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2013. Online.
- [55] Homer ML, Harrison MT, Perge JA, **Simeral JD**, Hochberg LR. Decoding target information improves the estimation of attempted movement by people with tetraplegia. Program No. 80.01. 2013 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2013. Online.

- [56] Sarma AA, Bacher D, Jarosiewicz B, Perge J, Milekovic T, **Simeral JD**, Hochberg LR, Donoghue JP. Decoding high-dimensional hybrid signals: feature and trial selection for use of an intracortical brain-computer interface by people with tetraplegia. Program No. 80.04. 2013 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2013. Online.
- [57] Bacher D, Sarma AA, Schmansky NJ, **Simeral JD**, Donoghue JP, Hochberg LR. Real-time simulation of broadband neural signals and closed-loop effector control for brain-computer interface development, validation and investigation. Program No. 80.07. 2013 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2013. Online.
- [58] Jarosiewicz B, Sarma AA, Bacher D, **Simeral JD**, Sorice B, Blabe C, Pandarinath C, Shenoy K, Henderson JM, Donoghue JP, Hochberg LR. Long-term stability of self-paced point-and-click typing by people with tetraplegia using an intracortical BCI. *41st Neural Interfaces Conference*. Dallas, TX. 2014. Online.
- [59] Sarma AA, Bacher D, Blabe C, Homer ML, Jarosiewicz B, Matteson E, Milekovic T, Pandarinath C, Saab J, **Simeral JD**, Sorice B, Shenoy KV, Henderson JM, Donoghue JP, Hochberg LR. Advancing stability and performance of point-and-click cursor control by people with tetraplegia using an intracortical brain-computer interface. Program No. 252.01. 2014 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2014. Online.
- [60] **Simeral JD**, Sarma AA, Jarosiewicz B, Bacher D, Homer ML, Sorice B, Saab J, Donoghue JP, Hochberg LR. Integrating advances in signal processing and decoding into intracortical BCIs for people with tetraplegia. Program No. 252.04. 2014 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2014. Online.
- [61] Saab J, Perge JA, Milekovic T, **Simeral JD**, Sorice B, Donoghue JP, Hochberg LR. Classifying movement types during an instructed delay task from motor cortex recordings in an individual with paralysis. Program No. 252.07. 2014 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2014. Online.
- [62] Blabe CH, Sorice B, Bacher D, Gilja V, Homer M, Jarosiewicz B, Milekovic T, Nuyujukian P, Pandarinath C, Perge JA, Saab J, Sarma AA, Shenoy KV, **Simeral JD**, Donoghue JP, Henderson JM, Hochberg LR. Collaborative, multi-institutional intracortical BCI research and the key role of the clinical neurotechnology research assistant. Program No. 252.02. 2014 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2014. Online.
- [63] Jarosiewicz B, Bacher D, Sarma AA, Masse NY, Berhanu ED, Sorice B, Oakley EM, Newel K, Blabe CH, Pandarinath C, Shenoy KV, Henderson JM, **Simeral JD**, Donoghue JP, Hochberg LR. Progress toward a self-calibrating, practical intracortical BCI for people with tetraplegia. Program No. 252.03. 2014 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2014. Online.
- [64] Sarma AA, Jarosiewicz B, Bacher D, Pandarinath C, Nuyujukian P, Sorice BL, Blabe C, **Simeral JD**, Donoghue JP, Shenoy KV, Henderson JM, Hochberg LR. Progress toward robust, high-performance intracortically controlled point-and-click communication for people with locked-in syndrome. *American Neurological Association Annual Meeting*: Baltimore, MD, 2014.
- [65] Jarosiewicz B, Bacher D, Sarma AA, Masse NY, **Simeral JD**, Sorice B, Oakley EM, Blabe C, Pandarinath C, Cash SS, Eskandar E, Friehs G, Shenoy KV, Henderson JM, Donoghue JP, Hochberg LR. Virtual typing by people with tetraplegia using a stabilized, self-calibrating intracortical brain-computer interface. *IEEE BRAIN Grand Challenges Conference*: Washington, DC, 2014.

- [66] Komar J, Heelan C, **Simeral JD**, Nurmikko AV. A programmable 192-channel wireless neural signal processing and decoding platform for wearable mobile applications. *IEEE BRAIN Grand Challenges Conference: Washington, DC*, 2014.
- [67] Lesenfants D, Saab J, Brandman DM, Jarosiewicz B, Sorice B, Sarma AA, **Simeral JD**, Donoghue JP, Hochberg LR. User state-based modulation of intracortical activity: distinguishing the idle state. Program No. 522.04. 2015 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2015. Online.
- [68] Sarma AA et al., Local field potentials in the motor cortex of people with tetraplegia: comparison using unsupervised methods. Program No. 522.02. 2015 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2015. Online.
- [69] Jarosiewicz B, Sarma AA, **Simeral JD**, Bacher D, Saab J, Sorice B, Blabe CH, Cash SS, Eskandar EN, Shenoy KV, Henderson JM, Hochberg LR. Multi-day self-calibration of a point-and-click communication BCI for people with tetraplegia. Program No. 522.03. 2015 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2015. Online.
- [70] Komar J, Heelan C, Vargas-Irwin CE, **Simeral JD**, Nurmikko AV. Real-time 200 channel broadband neural data collection and analysis in an embedded mobile data processing system. Program No. 450.15. 2015 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2015. Online.
- [71] Jarosiewicz B, Sarma AA, **Simeral JD**, Bacher D, Saab J, Sorice B, Blabe CH, Cash SS, Eskandar EN, Shenoy KV, Henderson JM, Hochberg LR. Toward a self-calibrating brain-computer interface for people with tetraplegia. American Society of Neurorehabilitation, 2015 Annual Meeting, Chicago, IL.
- [72] Ciancibello JG, Vilela M, Saab J, Hosman T, Hochberg LR, **Simeral JD**. Click decoding using "Sub-Region Classification" for intracortical brain computer interfaces. *Brown Mind/Brain Research Day*, Brown University, Providence, RI. March 30, 2016.
- [73] Hochberg LR, Kirsch RF, Ajiboye AB, Rosler DM, **Simeral JD**, Donoghue JP. Restoring upper limb control for Veterans with tetraplegia: BrainGate + FES. *National VA Research Week, Providence VA Medical Center*, Providence, RI. May 20, 2016.
- [74] *Heelan C, *Komar J, Nurmikko AV, **Simeral JD**. Progress toward a wireless, mobile device to enable neural control of assistive technologies. *National VA Research Week, Providence VA Medical Center*, Providence, RI. May 20, 2016.
- [75] Ciancibello JG, Vilela M, Saab J, Hosman T, Rosler DM, Hochberg LR, **Simeral JD**. Enabling on-screen click selection by individuals with tetraplegia using Multi-State Classification to decode intended movements from intracortical brain signals. *National VA Research Week, Providence VA Medical Center*, Providence, RI. May 20, 2016.
- [76] Ciancibello JG, Vilela M, Hosman T, Saab J, Lesenfants D, Brandman DM, Franco B, Hochberg LR, **Simeral JD**. Towards a multi-state click decoder in intracortical brain computer interfaces. Program No. 439.05. 2016 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2016. Online.
- [77] Lesenfants D, Saab J, Hosman T, Vilela M, Jarosiewicz B, Franco B, **Simeral JD**, Donoghue JP, Hochberg LR. Idle state detection from motor cortical activity in a person with tetraplegia using an intracortical brain computer interface. Program No. 439.07. 2016 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2016. Online.
- [78] Vilela M, Ciancibello JG, Hosman T, Saab J, Lesenfants D, Franco B, Jarosiewicz B, **Simeral JD**, Hochberg LR. Adaptive threshold for point-and-click applications using an intracortical brain computer interface. Program No. 439.08. 2016 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2016. Online.

- [79] Chavakula V, Fasoli S, Brandman DM, Saab J, Hosman T, Franco B, **Simeral JD**, Donoghue JP, Hochberg LR. Overcoming contextual differences in motor cortical neural firing patterns when controlling multiple end effector devices using an intracortical BCI. Program No. 439.11. 2016 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2016. Online.
- [80] Willett F, Murphy B, Memberg WD, Blabe CH, Jarosiewicz B, Pandarinath C, Walter B, Sweet J, Miller J, Henderson JM, Shenoy KV, **Simeral JD**, Hochberg LR, Kirsch RF, Ajiboye AB. Using direction-independent, movement magnitude information from motor cortex to enhance intracortical brain-computer interface performance. Program No. 439.09. 2016 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2016. Online.
- [81] Chavakula V, Fasoli SE, Brandman DM, Saab J, Hosman T, Franco B, **Simeral JD**, Donoghue JP, Hochberg LR. Contextual differences in motor cortical neural firing patterns when controlling multiple devices using an intracortical brain-computer interface (iBCI). 85th Annual Scientific Meeting of the American Association of Neurological Surgeons (AANS). 612. 2017.
- [82] Fasoli S, Chavakula V, Brandman D, Vargas-Irwin C, Saab J, Hosman T, Franco B, **Simeral J**, Donoghue J, Hochberg L. Intracortical brain-computer interface (iBCI) to control multiple end effectors: effects of context. Abstract ID 305174. ACRM 94th Annual Conference, Progress in Rehabilitation Medicine. Atlanta, GA: *American Congress of Rehabilitation Medicine*, 2017.
- [83] Lin D, Vilela M, Brandman D, Hosman T, Saab J, Sarma A, **Simeral J**, Truccolo W, Hochberg L. Investigation of the neural dynamics of human motor learning using an intracortical brain computer interface. Abstract ID 354217. ACRM 94th Annual Conference, Progress in Rehabilitation Medicine. Atlanta, GA: *American Congress of Rehabilitation Medicine*, 2017.
- [84] Chavakula V, Fasoli SE, Brandman DM, Vargas-Irwin C, Saab J, Hosman T, Franco B, Donoghue JP, **Simeral JD**, Hochberg LR. Contextual differences in motor cortical neural firing patterns when controlling multiple effector devices using an intracortical brain-computer interface (iBCI). *National VA Research Week, Providence VA Medical Center*, Providence, RI. May 19, 2017.
- [85] Brandman DM, Burkhart M, Hosman T, Saab J, Sarma AA, Milstein D, Vargas-Irwin C, Franco B, Donoghue JP, **Simeral JD**, Harrison MT, Hochberg LR. Intracortical brain computer interface control by a person with tetraplegia using a continuously updating Gaussian process decoder. *National VA Research Week, Providence VA Medical Center*, Providence, RI. May 19, 2017.
- [86] Willett F, Young DR, Murphy B, Memberg WD, Blabe CH, Saab J, Jarosiewicz B, Kelemen J, Brandman DM, Walter B, Sweet JA, Miller JP, Henderson JM, Shenoy KV, **Simeral JD**, Hochberg LR, Kirsch RF, Ajiboye AB. Neural population activity in the decoder's null space observed in people controlling a brain-computer interface. Program No. 230.08. 2017 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2017. Online.
- [87] Saab J, Hosman T, Yin M, Borton DA, Franco B, Kelemen J, Brandman DM, Vilela M, Ciancibello JG, Larson L, Rosler DM, **Simeral JD**, Nurmikko AV, Hochberg LR. Wireless intracortical BCI cursor control by a person with tetraplegia. Program No. 230.05. 2017 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2017. Online.
- [88] Vilela M, Ciancibello JG, Hosman T, Saab J, Brandman DM, Franco B, Kelemen J, **Simeral JD**, Hochberg LR. Assessment of discrete state selection strategies for intracortical brain-computer interface applications. Program No. 230.03. 2017 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2017. Online.

- [89] Heelan CD, Komar J, Nurmikko AV, **Simeral JD**. A mobile high-performance intracortical BCI with integrated antenna-receiver. Program No. 230.06. 2017 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2017. Online.
- [90] **Simeral JD**, Heelan CD, Komar J, Nurmikko AV. Advances in mobile wireless signal processing toward intracortical BCI deployment. Symposium Program No. 642.13. 2017 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2017. Online.
- [91] Brandman DM, Saab J, Hosman T, Franco B, Kelemen J, Nurmikko AV, Borton DA, Hochberg LR, **Simeral JD**. Comparing the bitrate communication performance of a wired vs. wireless intracortical brain computer interface in a person with tetraplegia. Program No. 505. 2018 ASSFN Biennial Meeting, Denver, CO: *American Society for Stereotactic and Functional Neurosurgery (ASSFN)*, 2018.
- [92] Brandman DM, Hosman T, Saab J, Kelemen J, Franco B, Hochberg LR, **Simeral JD**. Retrospective analysis of the effects of nonstationarities on decoding performance in people using an intracortical brain computer interface. Program No. 115622. *7th International Brain-Computer Interface Conference*, Asilomar, CA. 2018.
- [93] Milstein D, Kung HT, Pacheco JL, Hochberg LR, **Simeral JD**, Jarosiewicz B, Sudderth EB. Multiscale Semi-Markov Dynamics for Intracortical Brain-Computer Interfaces. *Microsoft New England Machine Learning Day 2018*. Cambridge, MA. 2018.
- [94] Heelan C, Shanahan BE, Brandman DM, Dusang AN, **Simeral JD**, Nurmikko AV. A mobile high-performance neural processing platform for next-generation high channel-count iBCIs. *43rd Neural Interfaces Conference*. Program No. 103. Minneapolis, MN. 2018.
- [95] Heelan CH, Komar J, Shanahan B, Brandman DM, Dusang AN, Laiwalla F, Rosler DM, Hochberg LR, Nurmikko AV, **Simeral JD**. A mobile high-performance BCI platform with integrated antenna-receiver. *National VA Research Week, Providence VA Medical Center*, Providence, RI. May 19, 2018.
- [96] Thengone DJ, Hosman T, Saab J, **Simeral JD**, Hochberg LR. Tracking longitudinal changes in sleep features in an intracortical brain-computer interface user with tetraplegia. Program No. 590.07. 2018 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2018. Online.
- [97] Brea JR, Shanahan BE, Saab J, Hosman T, **Simeral JD**, Hochberg LR. Approaching a 24/7 at-home BrainGate BCI system through design thinking, user-centered design and agile development. Program No. 672.05. 2018 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2018. Online.
- [98] Kelemen JN, Milstein D, Hochberg LR, Brandman DM, **Simeral JD**. Closed-loop BCI simulation through replay of recorded neural signals. Program No. 672.06. 2018 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2018. Online.
- [99] Heelan CD, Shanahan BE, Hochberg LR, Nurmikko AV, **Simeral JD**. Processing thousands of full-broadband neural channels in real-time on a mobile platform. Program No. 672.08. 2018 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2018. Online.
- [100] Hosman T, Vilela M, Saab J, Heelan CD, Brandman D, **Simeral JD**, Hochberg LR. Comparison of decoding accuracy: retrospectively trained recurrent neural network and Kalman vs the same-day Kalman decoder. Program No. 672.07. 2018 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2018. Online.

- [101] Pun ETK*, Catoya A*, Vargas-Irwin CE, Cash SS, **Simeral JD**, Hochberg LR. Identifying changes in volitional state and BCI task engagement based on the intrinsic structure of neural ensemble activity patterns in motor cortex of people with tetraplegia. Program No. 315.06. 2019 Neuroscience Meeting Planner. Chicago, OL: *Society for Neuroscience*, 2019. Online.
- [102] Thengone DJ, Hosman T, **Simeral JD**, Hochberg LR. Development of a novel auditory-reliant intracortical brain computer interface for effector control and communication in patients with tetraplegia. Program No. 406.18. 2019 Neuroscience Meeting Planner. Chicago, OL: *Society for Neuroscience*, 2019. Online.
- [103] Wilcoxon KG, Hosman T, Hynes JB, Saab J, Buchbinders BR, Schmansky N, Cash SS, Eskandar EN, **Simeral JD**, Franco B, Kelemen J, Vargas-Irwin CE, Hochberg LR. Human middle frontal gyrus exhibits activity related to both eye movements and intended hand movements. Program No. 315.03. 2019 Neuroscience Meeting Planner. Chicago, OL: *Society for Neuroscience*, 2019. Online.
- [104] Rubin D, Hosman T, Kelemen J, Coughlin B, Kimchi E, **Simeral J**, Hochberg L, Cash S. Learned motor patterns replayed in human motor cortex during sleep. *Annual Computational and Systems Neuroscience (COSYNE) Conference*. 208; 2-112. 2021.
- [105] **Simeral JD**, Hosman T, Singer-Clark T, Kelemen JN, Kapitonava A, Rosler DM, Nurmikko AV, Hochberg LR. Broadband wireless intracortical BCI enables independent use at home. *7th Annual NIH BRAIN Initiative Investigators Meeting*. p283. Washington, DC, 2021.
- [106] Singer-Clark T, Gross R, Hosman T, Kapitonava A, **Simeral JD**, Hochberg LR. Enabling a high quality user experience during independent home use of an iBCI by an individual with tetraplegia. Program No. 2021-S-5065. 2021 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2021. Online.
- [107] Hosman T, Vargas-Irwin CE, Kapitonava A, Hochberg LR, **Simeral JD**. Interaction of effector and direction encoding in motor cortex of a person with tetraplegia during a bimanual task. Program No. 2021-S-8952. 2021 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2021. Online.
- [108] Rubin D, Hosman T, Kapitonava A, **Simeral JD**, Cash S, Hochberg LR. Decoding speech from human motor cortex using an intracortical brain computer interface (P17-6.002). American Academy of Neurology 74th Annual Meeting, Seattle, WA. *Neurology* 98 (18 Supp.) 3743, 2022.
- [109] Gross-Lewis R, Singer-Clark T, Hosman T, Crawford R, Kapitonava A, **Simeral JD**, Hochberg LR. Engaging individuals with tetraplegia in user-centered design of a home intracortical BCI. VA National Research Day, Providence, RI. May 19, 2022.
- [110] Rubin D et al. Safety profile from the feasibility study of the BrainGate neural interface system. VA National Research Day, Providence, RI. May 19, 2022.
- [111] Pun TK, Hosman T, Kapitonava A, Vargas-Irwin CE, **Simeral JD**, Harrison MT, Hochberg LR. Tracking nonstationarity in multi-day intracortical neural recordings during iBCI use by a person with tetraplegia. Proceedings of AREADNE 2022, Santorini, Greece. 28 June – 2 July. *The AREADNE Foundation, Inc., Cambridge, Massachusetts, USA* 2022.

- [112] Hosman T, Vargas-Irwin CE, Thengone DJ, Kapitonava A, Hochberg LR, **Simeral JD**. Ten finger decoding from left precentral gyrus of a person with tetraplegia using an intracortical BCI. Program No. 475.02. 2022 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2022. Online.
- [113] Pun T, Hosman T, Kapitonava A, Vargas-Irwin CE, **Simeral JD**, Harrison MT, Hochberg LR. Tracking nonstationarity in multi-day intracortical neural recordings during iBCI cursor control by a person with tetraplegia. Program No. 475.03. 2022 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2022. Online.
- [114] Gross-Lewis R, Singer-Clark T, Hosman T, Crawford R, Kapitonava A, **Simeral JD**, Hochberg LR. Engaging individuals with tetraplegia in the user-centered design of a home intracortical BCI. Program No. 475.08. 2022 Neuroscience Meeting Planner. San Diego, CA: *Society for Neuroscience*, 2022. Online.
- [115] Gross-Lewis R, Crawford R, Singer-Clark T, Hosman T, Kapitonava A, Nicolas C, **Simeral JD**, Hochberg LR. User-centered design of a home intracortical application BCI for Veterans and other individuals with tetraplegia. *National VA Research Week, Providence VA Medical Center*, Providence, RI. May 11, 2023.
- [116] Gross-Lewis R, Crawford R, Singer-Clark T, Hosman T, Kapitonava A, Nicolas C, **Simeral JD**, Hochberg LR. Engaging a person with tetraplegia in the user-centered design of an at-home intracortical BCI system. *Northeast ALS Consortium (NEALS) 22nd Annual Meeting*, Key West, FL. October 2-4, 2023. Northeast ALS Consortium, 2023.
- [117] **Simeral JD**, Hosman T, Nurmikko AV, Rosler DM, Hochberg LR. A second-generation battery-powered embedded processing system for large scale broadband intracortical BCI. Program No. 488.11. 2023 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2023. Online.
- [118] Lütschg Espinosa SE, Hosman T, Nicolas C, Allcroft S, Herrick N, Hochberg LR, Vargas-Irwin CE, **Simeral JD**. Toward assistive communication using a discrete ten-digit single hemisphere intracortical brain computer interface. Program No. 488.01. 2023 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2023. Online.
- [119] Gusman JT, De Lucena DS, Hosman T, Nicolas C, Kapitonava A, Wagner DA, Hahn N, Henderson JM, **Simeral JD**, Vargas-Irwin CE, Walsh CJ, Hochberg LR. Using intracortical BCI decoding in human motor cortex for restoring natural control of sustained hand grips with a soft robotic glove. Program No. 488.03. 2023 Neuroscience Meeting Planner. Washington, DC: *Society for Neuroscience*, 2023. Online.
- [120] Lütschg Espinosa SE, Hosman T, Nicolas C, Jude J, Allcroft S, Herrick N, Hochberg LR, Vargas-Irwin CE, **Simeral JD**. Toward assistive communication using a discrete mixed-gesture single-hemisphere intracortical brain-computer interface. *National VA Research Week, Providence VA Medical Center*, Providence, RI. May 16, 2024.
- [121] Gusman J, de Lucena D, Hosman T, Rao K, Nicolas C, Kapitonava A, Acosta A, Wagner D, Hahn N, Rubin DB, Henderson JM, **Simeral JD**, Vargas-Irwin CE, Walsh CJ, Hochberg LR. Human intracortical brain-computer interface control of a soft robotic glove. Program No. nano48.01. 2024 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2024. Online.

- [122] Hahn NV, Stein E, **Simeral JD**, Hochberg LR, Henderson JM, Willett FR. Long term performance of intracortical microelectrode arrays for cursor control in 14 BrainGate participants. Program No. pstr030.14. 2024 Neuroscience Meeting Planner. Program No. Chicago, IL: *Society for Neuroscience*, 2024. Online.
- [123] Levi-Aharoni H, Jude J, Allcroft S, Acosta A, Haro S, **Simeral JD**, Hochberg L, Rubin DB. Hierarchical representations of language in human cortex at the single neuron level. Program No. pstr030.09. 2024 Neuroscience Meeting Planner. Program No. Chicago, IL: *Society for Neuroscience*, 2024. Online.
- [124] Haro S, Jude JJ, Acosta AJ, Levi-Aharoni, H, Allcroft S, Card NS, Wairagkar M, Brandman DM, Stavisky SD, **Simeral JD**, Hochberg LR, Rubin DB. Tailoring the Use of a Chronically-Implanted Intracortical Speech Neuroprosthesis for a Person With Long-Standing Anarthria. Program No. pstr030.15. 2024 Neuroscience Meeting Planner. Program No. Chicago, IL: *Society for Neuroscience*, 2024. Online.
- [125] Jude J, Allcroft S, Acosta A, Card N, Wairagkar M, Stavisky SD, Brandman D, **Simeral JD**, Hochberg L, Rubin D. An intuitive, bimanual, thirty-way, high-throughput sequence to sequence QWERTY keyboard typing neuroprosthesis. Program No. pstr030.22. 2024 Neuroscience Meeting Planner. Program No. Chicago, IL: *Society for Neuroscience*, 2024. Online.
- [126] Jude J, Haro S, Levi-Aharoni H, Acosta A, Allcroft S, Card N, Wairagkar M, Brandman D, Stavisky SD, **Simeral JD**, Hochberg LR, Rubin DB. A large vocabulary intracortical speech neuroprosthesis for a locked-in person with anarthria. Program No. pstr030.20. 2024 Neuroscience Meeting Planner. Program No. Chicago, IL: *Society for Neuroscience*, 2024. Online.
- [127] Herrick NC, Lütschg Espinosa SE, Hosman T, Nicolas C, Acosta A, Allcroft S, Vargas-Irwin CE, Hochberg LR, **Simeral JD**. Assistive virtual typing using mixed gesture decoding in a single-hemisphere intracortical brain-computer interface. Program No. PSTR030.23. 2024 Neuroscience Meeting Planner. Chicago, IL: *Society for Neuroscience*, 2024. Online.

Lectures and Presentations

National / International Invited & Keynote Lectures

“Architecture of the AT&T WorldMark Massively Parallel Computer System”
International NCR ASIC TIES Developers Conference
Breckenridge, CO
June 22, 1991 (Invited lecture).

“Toward neural control of assistive technologies for individuals with motor disability”
North Country Access Disabled Sports USA
Clayton, NY
July 19, 2008 (Keynote speaker).

“Intracortical neural interfaces for the restoration of communication and mobility”
Frontiers in Neuroengineering Monte Verita Conference
Locarno, Switzerland
September 8, 2010 (Keynote speaker).

“From a spike-centered brain universe to its underlying synaptic landscape: future technologies for brain reverse engineering and neuroprosthetics”

The European Future Technologies Conference and Exhibition FET11
Budapest, Hungary
May 5, 2011 (Symposium speaker)

“Engineering, neuroscience, and clinical evaluation of the BrainGate Neural Interface System.”

Neuroengineering Symposium, Beckman Institute
Urbana-Champaign, IL
June 16, 2011 (Invited lecture).

“BrainGate and the future of brain-computer interface technology.”
The Spinal Cord Injury Network Connections 2014 Conference
Sydney, Australia
Oct 13, 2014 (Keynote speaker).

“How could brain-computer interfaces enable reliable, potent assistive technology?”
Assistive Technology Industry Association (ATIF) Conference
Orlando, FL
February 4, 2016 (Platform lecture, CME Education Session)

“Effective BCI: Different approaches, common clinical purpose”
6th International BCI Society Meeting
Pacific Grove, CA
June 2, 2016 (Workshop organizer)

“Intracortical brain-machine interfaces: Experience from pilot clinical trials”
22nd Annual Brain Injury Symposium, Baptist Health South Florida
Miami, FL
October 15, 2016 (Keynote speaker)

“Recent advances in neural engineering for individuals with ALS/MND”
28th Annual International Symposium on ALS/MND, Westin Hotel
Beyond Pharmacotherapies; The innovation landscape in ALS
Boston, MA
Dec 9, 2017 (Keynote speaker)

Other National Meeting Presentations

“Ensemble spiking activity as a source of cortical control signals in individuals with tetraplegia”

Biomedical Engineering Society Annual Meeting
Los Angeles, CA.
September 27, 2007 (Platform lecture).

“Toward neural control of assistive technologies for individuals with motor disability”
ONR Workshop on Biorobotics and Human Interaction
Arlington, VA.
June 2, 2008.

“Advances in mobile wireless signal processing toward intracortical BCI deployment”
Nanosymposium on Peripheral Neural Interfaces for Reach and Grasp
Society for Neuroscience Annual Meeting
Washington, DC.
November 15, 2017 (Microsymposium lecture).

“Evolution of a real-time system for intracortical BCI: from NHPs to living room”
Translational Neuroscience and Neuroengineering Summer Workshop, Salve Regina University

Newport, RI
June 8, 2018 (Workshop instructor / lecturer)

Regional /Local Lectures

- “Toward neural control of assistive technologies for individuals with motor disability.”
Dept. Neuroscience, Brown University, Providence, RI
October 14, 2008.
- “BrainGate2: Toward Neural Control of Assistive Technologies for Individuals with Motor Disability.”
VA Medical Center, Providence, RI
March 18, 2009
- “Progress in the pilot clinical trial of the BrainGate intracortical neural interface system.”
VA Medical Center, Providence, RI
December 15, 2010 (Invited lecture)
- “Developing the BrainGate2 neural interface system across institutional boundaries.”
Brown University Research Day, Providence, RI
August 27, 2010 (Invited lecture)
- “Developing neural interface technology and assistive solutions for individuals with tetraplegia and locked-in syndrome.”
IEEE Engineering in Medicine and Biology Society, Providence Chapter
March 22, 2011 (Invited lecture)
- “Engineering the BrainGate neural interface system at Brown.”
Engineering Alumni Networking and Recruiting Event, Brown Univ, Providence, RI
February 4, 2012 (Invited lecture)
- “Toward neurotechnologies for people with paralysis, locked-in syndrome or upper limb loss.”
Everett Theater Company, Granoff Center for the Creative Arts. Brain Café.
Providence RI
December 10, 2012 (Invited lecture)
- “Rapid and flexible data investigation in the BrainGate pilot clinical trial.”
Institute for Computational and Experimental Research in Mathematics, Brown University, Providence RI
May 18, 2012 (Invited lecture)
- “Human-robot interaction: BrainGate2 for people with motor disability or upper limb loss”
Symposium on Human Robot Interaction, Brown University, Providence RI.
December 10, 2012 (Invited lecture)
- “Neural engineering for brain-computer interface neurotechnology”
Neural Engineering guest lecture, University of Rhode Island, Kingston RI.
March 12, 2015 (Invited lecture)
- “Brain-machine prostheses: independence for individuals with paralysis or amputation”
Prosthetics Industrial Design, Rhode Island Sch. of Design (RISD), Providence, RI
April 6, 2016 (Invited lecture).
- “Developing a high-performance intracortical BCI for individuals with tetraplegia”
Engineering Graduate Student Seminar Series, University of Rhode Island, Kingston RI.

October 19, 2016 (Invited lecture).

“Advances and future outlook in neuroscience: multi-site BrainGate BCI research”
Panel presentation, MedMates forum on neuroscience economic opportunities,
Providence RI.

April 26, 2017 (Invited panel lecture).

“An intracortical brain-computer interface – a look behind the technology curtain.”
VA Medical Center, Providence, RI

May 15, 2020 (Invited lecture)

“Elements of an intracortical BCI for home use by individuals with tetraplegia.”
MGH-Brown T32 Neurorecovery Seminar Series.

May 17, 2022 (Invited lecture, virtual)

“Virtual keyboard for use with an intracortical Brain-Computer Interface (BCI)”,
Brown University Innovations@Brown ShowCase

September 26, 2024

Microelectronics Devices Created

- 2014- Mobile Signal Processor for Medical & iBCI applications
A small-form, battery-powered hybrid embedded system processor for real-time neural signal processing and decoding. Developed through VA Merit-funded research for use in the BrainGate Neural Interface System pilot clinical trial and beyond. *In development.*
- 2016- Small Single-Frequency Broadband Receiver for Mobile iBCI Applications
A small-form, battery-powered single-band microwave receiver optimized for wheelchair deployment of a wireless mobile intracortical BCI. *In development.*
- 2020- Mobile Dual-Band Wireless Receiver for iBCI Applications
A small-form, battery-powered dual-band microwave RF receiver developed through VA Merit-funded research for deployment in the BrainGate pilot clinical trial. A robust redesign of a laboratory prototype from the Nurmikko lab. *In development.*