Michael Beyeler

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Lab: bionicvisionlab.org
Faculty Profile: CS, PBS

ACADEMIC APPOINTMENTS

- **Assistant Professor** · Computer Science (CS) · Psychological & Brain Sciences (PBS) 2019 – present
  Associate Director · Research Center for Virtual Environments and Behavior (ReCVEB)
  University of California, Santa Barbara (UCSB)
  Affiliations: Electrical & Computer Engineering (ECE) · Biological Engineering (BioE) · Dynamical Neuroscience (DYNS)
- **Postdoctoral Fellow** · Psychology · Institute for Neuroengineering · eScience Institute 2016 – 2019
  University of Washington (UW)

EDUCATION

- **PhD in Computer Science** · Specialization in Computational Neuroscience 2012 – 2016
  University of California, Irvine (UCI)
  Dissertation: Cortical neural network models of visual motion perception for decision-making and reactive navigation, May 2016. Committee: JL Krichmar (chair), N Dutt (co-chair), C Fowlkes
- **MS in Biomedical Engineering** · Focus on Bioelectronics 2009 – 2011
  ETH Zurich, Switzerland
- **BS in Electrical Engineering** · Major in Micro- and Optoelectronics 2005 – 2009
  ETH Zurich, Switzerland

HONORS & AWARDS

Major Fellowships, Honors & Awards

- DP2 New Innovator Award: *National Institutes of Health (NIH)* 2022
- K99/R00 Pathway to Independence Award: *NIH* 2018
- Innovation in Neuroengineering & Data Science Postdoctoral Fellowship: *Gordon & Betty Moore Foundation, Alfred P. Sloan Foundation, Washington Research Foundation (WRF)* 2016
- Chair's Fellowship for Outstanding PhD Applicants: *UCI* 2012

Best Paper Award Nominations

- Honorable Mention Best Paper Award (top 4%): C9, *Augmented Humans (AHs)* 2021
- Nominee: Best Student Paper, C6, *IEEE International Joint Conference on Neural Networks (IJCNN)* 2018
- Nominee: Best Student Paper, C1, *IEEE Biomedical Circuits & Systems Conference (BioCAS)* 2010

Other Conference Awards

- Best Poster Award (best of 15): W3, *Augmented Humans (AHs)* 2022
- Abstract of Distinction (top 3%): A34, *Association for Research in Vision & Ophthalmology (ARVO)* 2020
- Best Poster Award: A19, *Eye & Chip World Congress on Artificial Vision* 2017
- Presenters Travel Award, A15: *Computational & Systems Neuroscience (COSYNE)* 2017
- Best Workshop Talk Award: A6, *IEEE International Conference on Robotics & Automation (ICRA)* 2014

Other Academic Awards

- Nominee: Academic Senate Outstanding Graduate Mentor Award, *UCSB* 2022
- Finalist: Postdoc Mentoring Award, *UW* 2019

SELECTED MENTEE HONORS & AWARDS

Graduate Students

- Aiwen Xu, A45: Presenters Travel Award, COSYNE '23, *Simons Foundation, Reality Labs, Burroughs Wellcome Fund, The Gatsby Charitable Foundation* 2023
- Alex Rasla, C15: Gary Marsden Travel Award, VRST '22, *SIGCHI* 2022
- Ashley Bruce: Outstanding MS Student Award, *CS, UCSB* 2022
- Byron Johnson, A44: Travel Award, Biennial Perceptual Learning Workshop, *NIH* 2022
- Byron Johnson: Travel Award, CSHL Computational Neuroscience–Vision, *Helmsley Charitable Trust* 2022
- Ezgi I. Yücel: Innovation in Neuroengineering Graduate Fellowship, *WRF* 2017

Undergraduate Students

- Yuchen Hou: Abdullah & Marjorie R. Nasser Memorial Scholarship Fund Award, *PBS, UCSB* 2022
- Tanya Bhatia: Undergraduate Poster Presentation Award, *National Diversity in STEM Conference*, *Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)* 2021
- Nathan Wu: Outstanding Undergraduate Research Award, *CS, UCSB* 2021
- Jon Luntzel: Innovation in Neuroengineering Undergraduate Fellowship, *WRF* 2019

RESEARCH GRANTS & OTHER SUPPORT

Our share, total: $3.12M, as PI: $2.39M

Active Funding

- DP2 LM014268: Towards a *Smart Bionic Eye*: AI-powered artificial vision for the treatment of incurable blindness, *NIH*. PI: **M Beyeler**. ($1,250,136) 2022 – present
- Visual navigation under high-stress conditions: Improving situational awareness through deep-learning based vision augmentation in immersive virtual training environments, *Army's Institute for Collaborative Biotechnologies*. PIs: **M Beyeler**, M Hegarty, S Grafton, B Giesbrecht. (Our share: $150,000) 2021 – present
- R01 NS121919: Cortical visual processing for navigation, *NIH*. PI: S Smith. Co-PIs; M Goard, C Niell. Co-I: **M Beyeler**. (Our share: $718,387) 2021 – present
- K99/R00 EY029329: Virtual prototyping for retinal prosthesis patients, *NIH*. PI: **M Beyeler**. ($968,319) 2018 – present

Completed Funding

- Event-based scene understanding for bionic vision, *UCSB Academic Senate Research Faculty Grant*. PI: **M Beyeler**. ($10,000) 2021 – 2022
- An inaugural data science summit at UCSB, *Academic Data Science Alliance (ADSA)* PI: A Frank. Co-PIs: A Horst, **M Beyeler**. ($9,258) 2021
- Eye tracking in immersive virtual environments, *UCSB Academic Senate Research Faculty Grant*. PI: M Hegarty. Co-PI; **M Beyeler**. ($5,099) 2020 – 2021
- Cloud Credits for Research, *Amazon Web Services (AWS)* ($10,000) 2017

ACADEMIC MENTORING

Postdoctoral Scholars

Total: 2

- Amirali Vahid, Institute for Collaborative Biotechnologies (ICB), *UCSB* 2022 – 2023
- Melani Sanchez-Garcia, CS, *UCSB* 2022 – 2023

PhD Advisees · Chair

Total: 6

- Galen Pogoncheff, CS, *UCSB* 2022 – present
- Yuchen Hou, CS, *UCSB* 2022 – present
- Byron Johnson, PBS, *UCSB* (co-chair: Miguel Eckstein, PBS) 2020 – present

· Jacob Granley, CS, *UCSB* 2020 – present
· Aiwen Xu, CS, *UCSB* 2020 – present
· Justin Kasowski, Dynamical Neuroscience (DYNS), *UCSB* 2019 – present

PhD Advisees · Committee Member *Total: 7*
· Neeli Tummala, ECE, *UCSB* S'22 – present
· Dengxian Yang, CS *UCSB* S'22 – present
· Jeong-Jun Lee, ECE, *UCSB* S'22 – present
· Shravan Murlidaran, PBS, *UCSB* F'21 – present
· Yuqin Wang, CS, *UCSB* M'21 – present
· Sudhanshu Srivastava, DYNS, *UCSB* S'21 – present
· Wenrui Zhang, ECE, *UCSB* W'21 – M'21

PhD Advisees · External Examiner *Total: 4*
· Jack White, *Swinburne University of Technology, Melbourne, Australia* W'22
· Melani Sanchez Garcia, *Universad de Zaragoza, Spain* W'22
· Tristan Fauvel, Institute de la Vision, *Sorbonne Université, Paris, France* F'21
· Kexin Chen, Cognitive Sciences, *UCI* S'20

MS Advisees · Chair *Total: 8*
· Kimia Afshari, CS, *UCSB* F'22 – present
· Apurv Varshney, CS, *UCSB* F'21 – present
· Madori Spiker, CS, *UCSB* F'21 – S'22
· Alex Rasla, CS, *UCSB* F'21 – S'22
· Lucas Relic, CS, *UCSB* W'22 – S'22
· Ashley Bruce, CS, *UCSB* W'22 – S'22
· Ziming Qi, CE, *UCSB* F'20 – F'21
· Zuying (Collin) Hu, CS, *UCSB* W'20 – M'21

MS Advisees · Committee Member
· Satyam Awashti, CS, *UCSB* W'23

Staff Scientists *Total: 2*
· Lily Turkstra, Junior Specialist, *UCSB* F'22 – present
· Ryan Neydavood, Junior Specialist, *UCSB* M'21 – S'22

Undergraduate Honor Advisees *Total: 8*
· Ethan Meade, Distinction in the Major Program (DIMAP), CS, *UCSB* W'23 – present
· Lauren Eckhardt, Honors Program, PBS, *UCSB* F'22 – present
· Anvitha Akkaraju, Honors Program, PBS, *UCSB* F'21 – S'22
· Tanya Bhatia, Honors Program, PBS, *UCSB* F'21 – S'22
· Bill Nguyen, Honors Program, PBS, *UCSB* F'21 – S'22
· Rachel Mochizuki, Honors Program, PBS, *UCSB* W'21 – M'21
· Yang (Nathan) Wu, DIMAP, CS, *UCSB* W'21 – S'21

UC LEADS Mentorship Program Advisees
· Kha Nguyen, BS Student, Bioengineering, *University of California, San Diego (UCSD)* M'20

High School Advisees *Total: 9*

- Shivani Sama, *Tesla STEM High School, Redmond, WA* F'22 – present
- Andre Mao, UCSB Research Mentorship Program (RMP), *Homestead High School* M'21
- Chitsein Htun, UCSB RMP, *North Hollywood High School* M'21
- Emma Gao, UCSB RMP, *The Harker School* M'21
- Lisa Li, UCSB RMP, *Texas Academy of Mathematics and Science* M'21
- Surya Jasper, UCSB RMP, *Saint Francis High School* M'21
- Yash Jain, UCSB RMP, *Moreau Catholic High School* M'21
- Ethan Gao, UCSB RMP, *Ojai Valley School* M'20
- Versha Rohatgi, UCSB RMP, *Mountain View High School* M'20, M'21

ACADEMIC SERVICE

University-Wide Committees

- Member, CS Representative: Faculty Legislature, *UCSB* 2020 – 2022
- Postdoctoral Representative: Research Advisory Board, *UW* 2017 – 2019

Departmental Committees

- Member: Diversity, Equity, and Inclusion Committee, *CS, UCSB* 2022 – present
- Member: Graduate Admissions Committee, *DYNS, UCSB* 2021 – present
- Public Relations Committee, *CS, UCSB* 2019 – present
  - Co-chair, 2020 – 2021
  - Member, 2019 – 2020, 2021 – present
- Member: Graduate Admission Committee, *CS, UCSB* 2019 – 2020

Institutional Working Groups

- Member: Neuroinformatics Special Interest Group, *eScience Institute & UWIN, UW* 2017 – 2019
- Member: Reproducibility Working Group, *eScience Institute, UW* 2016 – 2018

Organized Workshops & Summits

- Steering Committee Member: 2022 Mind & Machine Intelligence Summit, *UCSB* 2021 – 2022
- Co-organizer: 2021 UCSB Data Science Summit, *UCSB* 2020 – 2021
- Organizer: Recent Computational Advances in Neuroengineering, Workshop, *Computational & Systems Neuroscience (COSYNE)* 2018

Editorial Boards

- Review Editor: *Frontiers in Human Neuroscience* 2020 – present
- Review Editor: *Frontiers in Neurorobotics* 2017 – 2020

Ad-Hoc Reviewing · Grants

- Reviewer, CDMRP VRP TECH, *Department of Defense (DoD)* 2022
- Reviewer, ZGM1 RCB-9 (CG), *NIH* 2021
- Early Career Reviewer (ECR), ZRG1 ETTN-P (81), *NIH* 2021

Ad-Hoc Reviewing · Selected Journals *publons.com/researcher/1188259/michael-beyeler*

ACM Journal on Emerging Technologies in Computing Systems (JETC) · eLife · Frontiers in Human Neuroscience · Frontiers in Neuroscience · IEEE Transactions on Neural Networks & Learning Systems (TNNLS) · Journal of Neural Engineering · Journal of Neuroscience · Journal of Vision · Nature Biomedical Engineering · Neural Networks · PLoS Computational Biology · Science Advances · Sensors · Vision Research

Ad-Hoc Reviewing · Selected Conferences

ACM Conference on Human Factors in Computing Systems (CHI) · Computational & Systems Neuroscience (COSYNE) · IEEE Conference on Virtual Reality and 3D User Interfaces (VR) · IEEE International Conference on Intelligent Robots & Systems (IROS) · IEEE International Symposium on Mixed and Augmented Reality (ISMAR) · Medical Image Computing & Computer Assisted Intervention (MICCAI)

PUBLICATIONS

scholar.google.com/citations?user=dK-0kG4AAAAJ

Note that in many areas of computer science, *conferences* are the primary venue for peer-reviewed publications, with selectivity and impact often exceeding that of journals (Chen & Konstan, 2010). The opposite is true in neuroscience. Legend: */** equal contribution, ⓘ invited publication, ® review/survey article

Refereed Journal Articles

J15 J Kasowski*, BA Johnson*, R Neydavood, A Akkaraju, **M Beyeler** (2023). A systematic review of extended reality (XR) for understanding and augmenting vision loss. *Journal of Vision*

J14 M Sanchez-Garcia*, T Chauhan*, BR Cottereau**, **M Beyeler**** (2023). Efficient multi-scale representation of visual objects using a biologically plausible spike-latency code and winner-take-all inhibition. *Biological Cybernetics*

J13 **M Beyeler**, M Sanchez-Garcia (2022). Towards a *Smart Bionic Eye*: AI-powered artificial vision for the treatment of incurable blindness. *Journal of Neural Engineering* 19:063001.

J12 EI Yücel, R Sadeghi, A Kartha, SR Montezuma, G Dagnelie, A Rokem, GM Boynton, I Fine, **M Beyeler** (2022). Factors affecting two-point discrimination in Argus II patients. *Frontiers in Neuroscience* 16:901337.

J11 K Chen, **M Beyeler**, JL Krichmar (2022). Cortical motion perception emerges from dimensionality reduction with evolved spike-timing dependent plasticity rules. *Journal of Neuroscience*. **Featured research article**

J10 RB Esquenazi, KM Meier, **M Beyeler**, GM Boynton, I Fine (2021). Learning to see again: Perceptual learning of simulated abnormal on- off- cell population responses in sighted individuals. *Journal of Vision* 21(13): 1–20.

J9 BW Brunton, **M Beyeler** (2019). Data-driven models in human neuroscience and neuroengineering[ⓘ®]. *Current Opinion in Neurobiology* 58: 21–29.

J8 **M Beyeler**, D Nanduri, JD Weiland, A Rokem, GM Boynton, I Fine (2019). A model of ganglion axon pathways accounts for percepts elicited by retinal implants. *Scientific Reports* 9(1):9199. [Code] [Data]

J7 **M Beyeler** (2019). Commentary: Detailed visual cortical responses generated by retinal sheet transplants in rats with severe retinal degeneration. *Frontiers in Neuroscience* 13: 471.

J6 **M Beyeler***, EL Rounds*, KD Carlson, N Dutt, JL Krichmar (2019). Neural correlates of sparse coding and dimensionality reduction®. *PLOS Computational Biology* 15(6):e1006908.

J5 **M Beyeler**, A Rokem, GM Boynton, I Fine (2017). Learning to see again: Biological constraints on cortical plasticity and the implications for sight restoration technologies®. *Journal of Neural Engineering* 14(5). **Featured cover article**

J4 **M Beyeler**, N Dutt, JL Krichmar (2016). 3D visual response properties of MSTd emerge from an efficient, sparse population code. *Journal of Neuroscience* 36(32): 8399–8415.

J3 **M Beyeler**, N Oros, N Dutt, JL Krichmar (2015). A GPU-accelerated cortical neural network model for visually guided robot navigation. *Neural Networks* 72: 75–87.

J2 **M Beyeler**, M Richert, ND Dutt, JL Krichmar (2014). Efficient spiking neural network model of pattern motion selectivity in visual cortex. *Neuroinformatics*, 1–20.

J1 **M Beyeler**, ND Dutt, JL Krichmar (2013). Categorization and decision-making in a neurobiologically plausible spiking network using a STDP-like learning rule. *Neural Networks* 48C: 109–124.

Refereed Conference Publications

C15 A Rasla, **M Beyeler** (2022). The relative importance of depth cues and semantic edges for indoor mobility using simulated prosthetic vision in immersive virtual reality. *ACM Symposium on Virtual Reality Software and Technology (VRST)*, Virtual/Tsukuba, Japan.

C14 J Granley, L Relic, **M Beyeler** (2022). A hybrid neural autoencoder for sensory neuroprostheses and its applications in bionic vision. *36th Conference on Neural Information Processing Systems (NeurIPS)*, New Orleans, LA.

C13 A Bruce, **M Beyeler** (2022). Greedy optimization of electrode arrangement for epiretinal prostheses. *Medical Image Computing & Computer Assisted Intervention (MICCAI)*, Singapore. **Highlighted in MICCAI Daily**

C12 J Kasowski, **M Beyeler** (2022). Immersive virtual reality simulations of bionic vision. *Augmented Humans (AHs)*, online. [Code] [Video]

C11 J Granley, **M Beyeler** (2021). A computational model of phosphene appearance for epiretinal prostheses. *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, online. [Code]

C10 Z Hu, **M Beyeler** (2021). Explainable AI for retinal prostheses: Predicting electrode deactivation from routine clinical measures. *IEEE EMBS Conference on Neural Engineering (NER)*, online.

C9 N Han, S Srivastava, A Xu, D Klein, **M Beyeler** (2021). Deep learning–based scene simplification for bionic vision. *Augmented Humans (AHs)*, online. [Code] [Data] **Honorable Mention Award (top 4 %)**

C8 **M Beyeler**, GM Boynton, I Fine, A Rokem (2019). Model-based recommendations for optimal surgical placement of epiretinal implants. *Medical Image Computing & Computer Assisted Intervention (MICCAI)*, Shenzhen, China.

C7 **M Beyeler** (2019). Biophysical model of axonal stimulation in epiretinal visual prostheses. *IEEE EMBS Conference on Neural Engineering (NER)*, San Francisco, CA.

C6 T-S Chou, HJ Kashyap, J Xing, S Listopad, EL Rounds, **M Beyeler**, N Dutt, JL Krichmar (2018). CARLsim 4: An open source library for large scale, biologically detailed spiking neural network simulations using heterogeneous clusters. *IEEE International Joint Conference on Neural Networks (IJCNN)*, Rio de Janeiro, Brazil. **Best Student Paper Nominee.** [Code]

C5 **M Beyeler**, GM Boynton, I Fine, A Rokem (2017). pulse2percept: A Python-based simulation framework for bionic vision. *Scientific Computing with Python (SciPy)*, p.81–88. [Code] [Talk]

C4 **M Beyeler***, KD Carlson*, T-S Chou*, N Dutt, JL Krichmar (2015). CARLsim 3: A user-friendly and highly optimized library for the creation of neurobiologically detailed spiking neural networks. *IEEE International Joint Conference on Neural Networks (IJCNN)*, Killarney, Ireland. [Code]

C3 KD Carlson, **M Beyeler**, N Dutt, JL Krichmar (2014). GPGPU accelerated simulation and parameter tuning for neuromorphic applications. *Asia and South Pacific Design Automation Conference (ASP-DAC)*, Suntec, Singapore.

C2 **M Beyeler**, F Mirus, A Verl (2014). Vision-based robust road lane detection in urban environments. *IEEE International Conference on Robotics & Automation (ICRA)*, Hong Kong, China.

C1 **M Beyeler**, F Stefanini, H Proske, CG Galizia, E Chicca (2010). Exploring olfactory sensory networks: simulations and hardware emulation. *IEEE Biomedical Circuits & Systems Conference (BioCAS)*, Paphos, Cyprus. **Best Student Paper Nominee.**

Refereed Workshop & Lightly Reviewed Short Papers

W5 J Granley, A Riedel, **M Beyeler** (2022). Adapting brain-like neural networks for modeling cortical visual prostheses. *SVRHM Workshop, NeurIPS*, New Orleans, LA.

W4 M Sanchez-Garcia, T Chauhan, BR Cottereau, **M Beyeler** (2022). Efficient visual object representation using a biologically plausible spike-latency code and winner-take-all inhibition. *NeuroVision Workshop, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, online.

W3 L Relic, B Zhang, YL Tuan, **M Beyeler** (2022). Deep learning-based perceptual stimulus encoder for bionic vision. *Augmented Humans (AHs)*, online. [Video] **Best Poster Award**

W2 S Tang, Z Qi, J Granley, **M Beyeler** (2021). U-Net with hierarchical bottleneck attention for landmark detection in fundus images of the degenerated retina. *OMIA8 Workshop, MICCAI*, online.

W1 J Kasowski, N Wu, **M Beyeler** (2021). Towards immersive virtual reality simulations of bionic vision. *Augmented Humans (AHs)*, online.

US Patent Applications

PA2 R Appuswamy, **M Beyeler**, P Datta, MD Flickner, DS Modha (2018). Long short-term memory (LSTM) on spiking neuromorphic hardware. US Patent App 15/434,672.

PA1 **M Beyeler**, ND Dutt, JL Krichmar (2017). Sparse and efficient neuromorphic population coding. US Patent App 15/417,626.

Selected Contributed Abstracts & Poster Presentations

A46 Y Hou, A Xu, D Martins, A Vahid, E Abe, C Niell, **M Beyeler** (2023). Retinal scene statistics for freely moving mice. *COSYNE '23*, Montreal, Canada (poster)

A45 A Xu, **M Beyeler** (2023). A biophysically detailed model of retinal degeneration. *COSYNE '23*, Montreal, Canada (poster, **A Xu: Travel Award**)

A44 BA Johnson, PN Chakravarthula, S Murlidaran, A Soni, **M Beyeler**, MP Eckstein (2022). The effect of a simulated scotoma on rapid scene understanding. *Biennial Perceptual Learning Workshop*, Anchorage, AK. (poster, **B Johnson: Travel Award**)

A37 T Bhatia, Y Hou, J Granley, B Johnson, **M Beyeler** (2021). Nonlinear interactions with the retina shape the artificial vision generated by a bionic eye. *SACNAS National Diversity in STEM Conference (NDiSTEM) '21*, online. (**T Bhatia: Undergraduate Poster Presentation Award**)

A34 **M Beyeler**, GM Boynton, I Fine, A Rokem (2020). Interpretable machine-learning predictions of perceptual sensitivity for retinal prostheses. *Association for Research in Vision & Ophthalmology (ARVO) '20*, Baltimore, MD. (**Abstract of Distinction, top 3 %**; canceled, COVID-19)

A20 **M Beyeler**, A Rokem, GM Boynton, I Fine (2017). Reverse-engineering optimized stimulation protocols in epiretinal prosthesis patients. *The Eye & the Chip '17*, Detroit, MI. (oral, **Platform Presentation**)

A19 GM Boynton, A Rokem, **M Beyeler**, J Dorn, NC Sinclair, MN Shivdasani, MA Petoe, R Hornig, I Fine (2017). Efficient and scalable measurements of sensitivity for high resolution electrode arrays. *The Eye & the Chip '17*, Detroit, MI. (poster, **Best Poster Award**)

A6 **M Beyeler**, M Richert, N Oros, N Dutt, JL Krichmar (2014). A cortical spiking neural network model for visually guided robot navigation. Neurobiologically Inspired Robotics workshop, *ICRA'14*, Hong Kong, China. (oral, **Best Student Talk Award**).

A1 **M Beyeler**, ND Dutt, JL Krichmar (2013). Spiking neural network model of visual pattern recognition and decision-making using a stochastic STDP learning rule. *JSNC'13*, Pasadena, CA. (poster)

INVITED EXTERNAL TALKS & SEMINARS

Scheduled

T28	60th Anniversary Conference, *Smith-Kettlewell Eye Research Institute, San Francisco, CA*	Aug 2023
T27	Neuroscience + AI Seminar, *Carnegie Mellon University*	Apr 2023

Past

T26	20th Annual World Congress of the Society for Brain Mapping & Therapeutics, *Los Angeles, CA*	Feb 2023
T25	Braille Institute, *Santa Barbara, CA*	Jan 2023
T24	Science & Engineering Council of Santa Barbara, *Santa Barbara, CA*	Dec 2022
T23	Optica Fall Vision Meeting, *Rochester, NY*	Oct 2022
T22	San Marcos High School, *Goleta, CA*	Oct 2022
T21	NeuroVision Workshop, *CVPR '22, New Orleans, LA*	Jun 2022
T20	Translational Neuroengineering Technologies (TNT) Network, *Johns Hopkins University*	Apr 2022
T19	Tri-Service Research Laboratory (TSRL), Air Force, *JBSA-Fort Sam Houston, TX*	Mar 2022
T18	Universidad Miguel Hernandez, *Elche, Spain*	Feb 2022
T17	Claremont Colleges, *Claremont, CA*	Oct 2021
T16	Eye & Chip World Congress on Artificial Vision (plenary), *Detroit Institute of Ophthalmology*	Oct 2021

T15 17th Annual World Congress of the Society for Brain Mapping & Therapeutics, *Los Angeles, CA* Jul 2021
T14 14th Conference on Learning & Memory: Cellular and Systemic Views (canceled, COVID-19) Mar 2020
Leibniz Institut für Neurobiologie, Magdeburg, Germany
T13 Department of Cognitive Sciences, *University of California, Irvine, CA* Apr 2019
T12 Department of Computer Science, *Duke University, Durham, NC* Mar 2019
T11 Department of Computer Science, *University of California, Santa Barbara, CA* Jan 2019
T10 Recent Advances in Neuroengineering Workshop, *COSYNE '18, Breckenridge, CO* Mar 2018
T9 Center for Applied and Translational Sensory Science (CATSS), *University of Minnesota,* Feb 2018
Minneapolis, MN
T8 Eye & Chip World Congress on Artificial Vision (plenary), *Detroit Institute of Ophthalmology* Sep 2017
T7 Cluster of Excellence in Cognitive Interaction Technology (CITEC), *Bielefeld University,* Aug 2017
Germany
T6 Center for Perceptual Systems, *University of Texas, Austin, TX* Jul 2017
T5 UW Medicine Eye Institute, *University of Washington, Seattle, WA* Feb 2017
T4 Second Sight Medical Products Inc., *Sylmar, CA* Nov 2016
T3 Department of Psychology, *University of Washington, Seattle, WA* Dec 2015
T2 IBM Research, *San Jose, CA* Aug 2015
T1 Qualcomm Technologies Incorporated, *San Diego, CA* Nov 2014

TEACHING ACTIVITIES

Undergraduate Courses

UC4 CS-165A: Artificial Intelligence, *UCSB* F'23, W'24
UC3 PSY-132: Visual Neuroscience, *UCSB* S'23
UC2 CS/ECE-181: Introduction to Computer Vision, *UCSB* W'21, F'22
UC1 PSYCH-130: Sensation & Perception · Vision, *UCSB* F'20

Graduate Courses

GC3 CS/ECE-281B: Advanced Topics in Computer Vision, *UCSB* W'23
GC2 PSY-221F: Computational Neuroscience S'22, S'24
GC1 CS-291A: Bionic Vision, *UCSB* W'20, F'21

Selected Guest Lectures

GL8 BIOEN-460: Neural Engineering, undergrad, *UW* F'21
GL7 DS-1 (CS-90DA): Data Science Foundations, undergrad, *UCSB* F'20
GL4 NRSC-490: Advanced Topics in Neuroscience, undergrad, *U Puget Sound* S'18
GL1 PSYCH-268A: Computational Neuroscience, undergrad, *UCI* F'15

Graduate Teaching Assistant

TA3 CS-143A: Principles of Operating Systems, 186 students, undergrad, *UCI* S'15
TA2 CS-171: Introduction to Artificial Intelligence, 81 students, undergrad, *UCI* W'15
TA1 Networks & Circuits I & II, undergrad, *ETH Zurich, Switzerland* F'09, S'10

Teaching Publications

TP5 M Gevorgyan, A Mamikonyan, **M Beyeler** (2020). OpenCV4 with Python Blueprints, Second Edition. *Packt Publishing Ltd.*, Birmingham, UK, 366 pages, ISBN 978-178980181-1.
TP4 A Sharma, VR Shrimali, **M Beyeler** (2019). Machine Learning for OpenCV 4, Second Edition. *Packt Publishing Ltd.*, Birmingham, UK, 420 pages, ISBN 978-178953630-0.
TP3 **M Beyeler** (2017). Machine Learning for OpenCV. *Packt Publishing Ltd.*, Birmingham, UK, 382 pages, ISBN 978-178398028-4. **Also available in Korean, Japanese, and as a video course.** [Code]

TP2 J Howse, P Joshi, **M Beyeler** (2016). OpenCV: Computer Vision Projects with Python. *Packt Publishing Ltd.*, Birmingham, UK, 558 pages, ISBN 978-178712549-0.

TP1 **M Beyeler** (2015). OpenCV with Python Blueprints. *Packt Publishing Ltd.*, Birmingham, UK, 230 pages, ISBN 978-178528269-0. [Code]

SCIENCE COMMUNICATION & PUBLIC OUTREACH

Public Lectures

PL2 UCSB Groundbreaking Research/Innovative Technology (GRIT), *UCSB* 2022

PL1 UCSB Open House (formerly 'Spring Insight'), virtual lecture, *UCSB* 2020

Media Coverage

MC9 Interview with Prof. Beyeler, *TechGuide* 2023

MC8 Greedy optimization of electrode arrangement for epiretinal prostheses, *MICCAI Daily Magazine* 2022

MC7 A neural autoencoder to enhance sensory neuroprostheses, *TechXplore* 2022

MC6 Are we witnessing the dawn of post-theory science?, *The Guardian* 2022

MC5 Will it be possible to upload information to my brain?, *Gizmodo Asks* 2021

MC4 Building the bionic eye. . . with car tech?, *PCMag* 2021

MC3 Interview with Dr. Beyeler, *SciSection Media Group, Ontario, Canada* 2020

MC2 Reverse engineering the brain: "fooling" the mind to see, *Convergence Magazine, UCSB* 2020

MC1 Restoring vision with bionic eyes: no longer science fiction, *PCMag* 2019

Panels

PS3 ADSA Career Panel 2023

PS2 Demystifying the K99/R00 application at the National Eye Institute (NEI) 2021

PS1 An Evening with Neuroscience, *UW* 2019

Documentary & Video Appearances

VA2 I AM AI, GTC 2021, *NVIDIA, Santa Clara, CA* 2021

VA1 Made with Android, *Google Developers, Mountain View, CA* 2015

Community Involvement & Public Outreach

CI7 Competition judge: Global Undergraduate Awards, *Dublin, Ireland* 2021 – present

CI6 Competition judge: SBHacks Hackathon, *UCSB* 2020 – 2021

CI5 Competition judge: US Congressional App Challenge, *Washington, DC* 2019 – 2020

CI4 Outreach & fundraising: Lighthouse Foundation for the Blind, *Seattle, WA* 2018

CI3 Neuronline community leader, *Society for Neuroscience (SfN)* 2016 – 2017

CI2 Student volunteer, *IEEE Robotics & Automation Society (RAS)* 2014 – 2016

CI1 Lab tour leader: Mathobotix "Bytes and Bots" K-12 Summer Camp, *UCI* 2013, 2014

PROFESSIONAL ASSOCIATIONS

· Member: *IEEE Engineering in Medicine & Biology Society (EMBS)* 2019 – present

· Member: *Association for Computing Machinery (ACM)* 2019 – present

· Member: *Organization for Computational Neurosciences (OCNS)* 2018 – present

· Member: *Association for Research in Vision & Ophthalmology (ARVO)* 2018 – present

· Member: *Vision Sciences Society (VSS)* 2017 – present

· Member: *Society for Neuroscience (SfN)* 2013 – present

- Neuronline Community Leader, 2016 – 2017

REJECTIONS & FAILURES

An attempt to normalize 'failure' in academia. Inspired by: Melanie Stefan (2010), A CV of Failures. *Nature* 468(467).
Legend: TT tenure track, PD postdoc, PhD grad

Academic Positions *Success rate, TT: 3 % (n=31), PD: 100 % (n=2), PhD: 50 % (n=2)*

- Tenure-track positions (R1): 17 no answers, 12 explicit rejections, 1 rejection after interview 2019
- Rockefeller University, Postdoctoral Position: accepted, offer declined 2016
- EPFL Neuroscience Graduate program: rejected 2013

Professional *Success rate, TT: 25 % (n=4)*

- MICCAI area chair: not selected 2021
- Next Generation Leaders Council at the Allen Institute for Brain Science: not selected 2020
- OCNS program committee: invited to apply 2019

Extramural Grants & Major Awards *Success rate, TT: 42 % (n=12), PD: 50 % (n=2)*

- National Science Foundation (NSF) AI Institutes: not awarded, role: co-PI 2023
- NSF Research Traineeship (NRT): not awarded, role: co-PI 2023
- Office of Naval Research (ONR) Special Notice: invited for full proposal, role: co-PI 2021
- SONY Focused Research Award: not awarded, role: co-PI 2021
- Chan Zuckerberg Institute (CZI) Essential Open Source Software: not awarded, role: PI 2020
- NSF NeuroNex: invited for full proposal, role: co-PI 2020
- ADSA seed grant: finalist, role: co-PI 2019
- Burroughs Wellcome Award at the Scientific Interface (CASI): invited for full proposal, role: PI 2018

Fellowships & Travel Awards *Success rate, TT: 25 % (n=4), PD: 100 % (n=4), PhD: 44 % (n=9)*

- Sloan Research Fellowship: not awarded 2023
- Microsoft Research Faculty Fellowship: not awarded 2021
- IJCNN Travel Award: not awarded 2015
- NVIDIA Graduate Fellowship: not awarded 2013 – 2015
- Microsoft Research Fellowship: not awarded 2013

Workshops *Success rate, TT: 50 % (n=2), PD: 50 % (n=2)*

- NeurIPS workshop proposal: rejected 2021
- VSS workshop proposal: rejected 2019

Scientific Peer Review

- J15, *Journal of Vision*: rejected from 2 top-tier ACM conferences and 1 translational journal 2023
- C12, *Augmented Humans (AHs)*: rejected from a top-tier ACM conference 2022
- W2, *MICCAI-W*: rejected from main conference 2021
- J8, *Sci Rep*: desk-rejected from 5 high-impact neuroscience journals 2018
- J7, *Front Neurosci*: desk-rejected from 1 high-impact neuroscience journal 2018
- J6, *PLOS Comp Bio*: desk-rejected from 3 high-impact neuroscience journals 2017
- COSYNE abstract: rejected 2015, 2018