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 (co-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 Award Nominations

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

RESEARCH GRANTS & OTHER SUPPORT

Our share, total: $3.2M, as sole PI: $2.2M

Active Funding

- Computational virtual patient to predict perceptual capabilities of prosthetic vision, *UC Noyce Initiative*. PI: MP Eckstein, Co-PI: **M Beyeler**. (Our share: $100,000) — 2023 – present
- 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, *Institute for Collaborative Biotechnologies (ICB)*. 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. MPIs; M Goard, C Niell. Co-I: **M Beyeler**. (Our share: $718,387) — 2021 – present

Completed Funding

- K99/R00 EY029329: Virtual prototyping for retinal prosthesis patients, *NIH*. PI: **M Beyeler**. ($968,319) — 2018 – 2023
- 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

ACADEMIC MENTORING

Postdoctoral Scholars

Total: 2

- Amirali Vahid, ICB, *UCSB* (now: Postdoc at Stanford Medicine) — 2022 – 2023
- Melani Sanchez Garcia, CS, *UCSB* (now: Senior AI Research at Kimera Technologies, Valencia, Spain) — 2022 – 2023

PhD Advisees · Chair

Total: 9

- Lily M. Turkstra, PBS, *UCSB* — 2023 – present
- Apurv Varshney, CS, *UCSB* — 2023 – present
- Lucas Gil Nadolskis, Dynamical Neuroscience (DYNS), *UCSB* — 2023 – present
- Galen N. Pogoncheff, CS, *UCSB* — 2022 – present
- Yuchen Hou, CS, *UCSB* — 2022 – present
- Byron A. Johnson, PBS, *UCSB* (co-chair: Miguel Eckstein, PBS) — 2020 – present
- Jacob Granley, CS, *UCSB* — 2020 – present
- Aiwen Xu, CS, *UCSB* (soon: Software Engineer at Snowflake AI) — 2020 – 2024
- Justin M. Kasowski, DYNS, *UCSB* (now: Founder & CEO at RealmVR) — 2019 – 2023

PhD Advisees · Committee Member

Total: 9

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*

- Sangita Kunapuli, BS/MS, CS, *UCSB* S'24 – present
- Callie Sardina, CS *UCSB* F'23 – present
- Madori Spiker, CS, *UCSB* F'21 – S'22, W'23 – W'24
- 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 *Total: 6*

- Anika Arora, CS, *UCSB* S'24
- Sydney Lim, CS, *UCSB* M'23
- Ian Wu, CS, *UCSB* M'23
- Vivian Ross, CS, *UCSB* S'23
- Kaiwen Li, CS, *UCSB* S'23
- Satyam Awashti, CS, *UCSB* W'23

Lab Managers *Total: 3*

- Tori LeVier, Student Assistant, *UCSB* F'23 – S'24
- Lily Turkstra, Junior Specialist, *UCSB* F'22 – M'23
- Ryan Neydavood, Junior Specialist, *UCSB* M'21 – S'22

Undergraduate Honor Advisees *Total: 8*

- Ivy Wang, Distinction in the Major Program (DIMAP), CS, *UCSB* F'23 – S'24
- Ethan Meade, DIMAP, CS, *UCSB* W'23 – S'23
- Lauren Eckhardt, Honors Program, PBS, *UCSB* F'22 – S'23
- 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

Undergraduate Research Assistants *Total: 74*

UC LEADS Mentorship Program Advisees

- Kha Nguyen, BS Student, Bioengineering, *University of California, San Diego (UCSD)* M'20

High School Advisees *Total: 11*

- Andrew Liang, UCSB Research Mentorship Program (RMP), *The Harker School* M'23
- Emma Shen, UCSB RMP, *Del Norte High School* M'23
- Shivani Sama, *Tesla STEM High School, Redmond, WA* F'22 – S'23
- Andre Mao, UCSB 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: Graduate Admissions Committee, *CS, UCSB* 2023 – present
- Member: Diversity, Equity, and Inclusion Committee, *CS, UCSB* 2022 – present
- Public Relations & Awards Committee, *CS, UCSB* 2019 – present
  - Chair, 2023 – present
  - Co-chair, 2020 – 2021
  - Member, 2019 – 2020, 2021 – 2022
- Member: Graduate Admissions Committee, *DYNS, UCSB* 2021 – 2023
- Member: Graduate Admissions Committee, *CS, UCSB* 2019 – 2020

Organized Workshops & Summits

- Organizing Committee Member: Optica Fall Vision Meeting 2024 – present
- 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

- Guest Editor: *eLife* 2023
- Review Editor: *Frontiers in Human Neuroscience* 2020 – present
- Review Editor: *Frontiers in Neurorobotics* 2017 – 2020

Ad-Hoc Reviewing · Grants

- Ad-hoc reviewer, ZEB1 OSR-H (O1) R, *Bioethics & Tech Development, NIH* 2024
- Ad-hoc reviewer, *Army Research Office (ARO)* 2024
- Ad-hoc reviewer, ZRG1 NV-P (81) S, *BIVT, NIH* 2023, 2024
- Ad-hoc reviewer, CDMRP VRP TECH, *Department of Defense (DoD)* 2022
- Ad-hoc reviewer, FOReSIGHT, *Institut Hospitalo-Universitaire (IHU), Paris, France* 2022
- Ad-hoc reviewer, ZGM1 RCB-9 (CG), *BIVT, NIH* 2021
- Early Career Reviewer (ECR), ZRG1 ETTN-P (81), *NIH* 2021

Ad-Hoc Reviewing · Selected Journals

publons.com/researcher/1188259/michael-beyeler

Communications Biology · 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 · Nature Biomedical Engineering · Neural Networks · PLoS Computational Biology · Science Advances · 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 Circuits & Systems (ISCAS) · IEEE International Symposium on Mixed and Augmented Reality (ISMAR) · Medical Image Computing & Computer Assisted Intervention (MICCAI) · Scientific Computing with Python (SciPy)

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

J19 Y Hou, D Nanduri, JD Weiland, **M Beyeler** (2024). Axonal stimulation affects the linear summation of single-point perception in three Argus II users. *Journal of Neural Engineering* 21 026031 [Code] [Data]

J18 G Pogoncheff, Z Hu, A Rokem, **M Beyeler** (2024). Explainable machine learning predictions of perceptual sensitivity for retinal prostheses. *Journal of Neural Engineering* 21 026009 [Code]

J17 A Varshney*, M Munns*, J Kasowski, M Zhou, C He, S Grafton, B Giesbrecht, M Hegarty, **M Beyeler** (2024). Stress affects navigation strategies in immersive virtual reality. *Scientific Reports*

J16 A Xu, **M Beyeler** (2023). Retinal ganglion cells undergo cell type–specific functional changes in a computational model of cone-mediated retinal degeneration. *Frontiers in Neuroscience* 17:1147729 [Code]

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 23(5):5, 124* **Featured cover article**

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 117:95111*

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

C19 Y Hou, L Pullela, J Su, S Aluru, X Lu, **M Beyeler** (2024). Predicting the temporal dynamics of prosthetic vision. *46th International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Orlando, FL. (**oral**) [Code]

C18 A Xu, Y Hou, CM Niell, **M Beyeler** (2023). Multimodal deep learning model unveils behavioral dynamics of V1 activity in freely moving mice. *37th Conference on Neural Information Processing Systems (NeurIPS)*, New Orleans, LA. [Code] [Data]

C17 J Granley, T Fauvel, M Chalk, **M Beyeler** (2023). Human-in-the-loop optimization for deep stimulus encoding in visual prostheses. *37th NeurIPS*, New Orleans, LA. [Code]

C16 G Pogoncheff, J Granley, **M Beyeler** (2023). Explaining V1 properties with a biologically constrained deep learning architecture. *37th NeurIPS*, New Orleans, LA. [Code]

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). Hybrid neural autoencoders for stimulus encoding in visual and other sensory neuroprostheses. *36th 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 & parameter tuning for neuromorphic applications[ⓘ]. *Asia and South Pacific Design Automation Conference (ASP-DAC)*, 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

W8 J Granley*, G Pogoncheff*, A Rodil, L Soo, LM Turkstra, LG Nadolskis, A Alfaro Saez, C Soto Sanchez, E Fernandez Jover, **M Beyeler** (2024). Beyond sight: Probing alignment between image models and blind V1. *Workshop on Representational Alignment (Re-Align),* ICLR *'24*, Vienna, Australia. **Spotlight Talk**

W7 S Awasthi, V Ross, S Lim, **M Beyeler**, T Höllerer (2024). Eye tracking performance in mobile mixed reality. *IEEE VR*, Orlando, FL

W6 S Awashti, V Ross, **M Beyeler**, T Höllerer (2023). Eye Tracking Test Suite: Evaluating and calibrating eye tracking for mixed-reality locomotion. *ISMAR-Adjunct*, Sydney, Australia

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 Patents

P1 R Appuswamy, **M Beyeler**, P Datta, MD Flickner, DS Modha (2023). Long Short-Term Memory (LSTM) cells on spiking neuromorphic hardware. US Patent No. 11,636,317.

Selected Contributed Abstracts & Poster Presentations

A50 L Gil Nadolskis, G Pogoncheff, J Granley, A Rodil, L Soo, LM Turkstra, TC Sprague, A Alfaro Saez, C Soto Sanchez, E Fernandez Jover, **M Beyeler** (2024). Sustained stimulus-selective multi-unit activity in human primary visual cortex. *Vision Sciences Society (VSS) '24*, St. Pete's Beach, FL (**oral**)

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

A43 BA Johnson, PN Chakravarthula, S Murlidaran, A Soni, **M Beyeler**, MP Eckstein (2022). The effect of a simulated scotoma on rapid scene understanding. *CVS Symposium on Active Vision*, Rochester, NY (**oral**)

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. *Society for Advancement of Chicanos/Hispanics and Native Americans in Science (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)

A25 **M Beyeler**, EI Yucel, A Rokem, GM Boynton, I Fine (2018). Optimizing stimulation protocols for prosthetic vision based on retinal anatomy. *COSYNE'18*, Breckenridge, CO. (oral)

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**).

INVITED EXTERNAL TALKS & SEMINARS

T35	Learning to see again: The role of perceptual learning & user engagement in sight restoration, *VSS Symposium, St. Pete's Beach, FL*	May 2024
T34	Neuralink Corporation, *Fremont, CA*	Jan 2024
T33	Eye & Chip World Congress on Artificial Vision (plenary), *Detroit Institute of Ophthalmology*	Oct 2023
T32	Cortical Prostheses Workshop: Interdisciplinary Research Towards Artificial Vision for the Blind, *Hanse-Wissenschaftskolleg Institute for Advanced Study, Delmenhorst, Germany*	Sep 2023
T31	Institute of Neuroinformatics, *ETH/University Zurich, Switzerland*	Aug 2023
T30	Vision and Color Summer Data Blast, *Optica Society*	Aug 2023
T29	60th Anniversary Conference, *Smith-Kettlewell Eye Research Institute, San Francisco, CA*	Aug 2023
T29	Center for Visual Science, *University of Rochester*	Jul 2023
T28	Hybrid Human-Machine Intelligence Summit, *DEVCOM Army Research Lab, Stanford, CA*	Jun 2023
T27	Neuroscience + AI Seminar, *Carnegie Mellon University*	Apr 2023
T26	20th Annual World Congress of the Society for Brain Mapping & Therapeutics (SBMT), *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/18th Annual World Congress of SBMT, *Los Angeles, CA*	Jul 2021
T14	14th Conference on Learning & Memory: Cellular and Systemic Views (canceled, COVID-19), *Leibniz Institut für Neurobiologie, Magdeburg, Germany*	Mar 2020
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, Minneapolis, MN*	Feb 2018
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, Germany*	Aug 2017
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* W'24
UC3 PSY-132: Visual Neuroscience, *UCSB* S'23
UC2 CS/ECE-181: Introduction to Computer Vision, *UCSB* W'21, F'22
UC1 PSY-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
GC1 CS-291A: Bionic Vision, *UCSB* W'20, F'21

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]

MEDIA COVERAGE

Public Lectures

PL2 UCSB Groundbreaking Research/Innovative Technology (GRIT), *UCSB* 2022
PL1 UCSB Open House (formerly 'Spring Insight'), virtual lecture, *UCSB* 2020

Selected Media Coverage

M11 Towards a Smart Bionic Eye: YouTube, NNLM Discovery Podcast, *National Library of Medicine* 2024
M10 UCSB professor receives NIH Directors New Innovator Award, *Daily Nexus* 2023
M8 Greedy optimization of electrode arrangement for epiretinal prostheses, *MICCAI Daily Magazine* 2022
M6 Are we witnessing the dawn of post-theory science?, *The Guardian* 2022
M5 Will it be possible to upload information to my brain?, *Gizmodo Asks* 2021
M4 Building the bionic eye. . . with car tech?, *PCMag* 2021
M1 Restoring vision with bionic eyes: no longer science fiction, *PCMag* 2019

Panels

PS3 ADSA Neuroscience Career Panel 2023
PS2 Demystifying the K99/R00 application at the National Eye Institute (NEI) 2021
PS1 An Evening with Neuroscience, *UW* 2019

Selected 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

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: 33 % (n=6)*

- Harold J. Plous Memorial Award: not selected 2023
- 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 PI: 37.5 % (n=8), TT co-PI: 22 % (n=9), PD: 50 % (n=2)*

- Moore Inventor Fellowship: not selected, role: PI 2024
- NIH R01: not awarded, role: co-PI 2023
- AFOSR Young Investigator Program: not invited for full proposal, role: PI 2023
- National Science Foundation (NSF) CAREER: not awarded, role: PI 2023, 2024
- 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: 50 % (n=6), PD: 100 % (n=4), PhD: 44 % (n=9)*

- Sloan Research Fellowship: not awarded 2023, 2024
- 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: 67 % (n=3), PD: 50 % (n=2)*

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

Scientific Peer Review

- J18, *Journal of Neural Engineering*: rejected from an IEEE journal 2023
- J16, *Frontiers in Neuroscience*: rejected from 2 high-impact neuroscience journals 2023
- J15, *Journal of Vision*: rejected from 2 top-tier HCI conferences and 1 translational journal 2023
- C12, *Augmented Humans (AHs)*: rejected from a top-tier HCI conference 2022
- W2, *MICCAI-W*: rejected from main conference track 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