

# Kateryna Voitiuk

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## EDUCATION

### University of California, Santa Cruz

2019 - 2024

Ph.D. Biomolecular Engineering and Bioinformatics

GPA: 4.0

*Platforms for In Vitro Electrophysiology Experiments on the Internet of Things*

Advisors: David Haussler, Mircea Teodorescu

### University of California, Santa Cruz

2015 - 2019

B.A. Network and Digital Technology

GPA: 3.85

Graduated with Highest Honors in the major

University Honors: Magna Cum Laude

## EXPERIENCE

### Open Culture Science, Inc.

2024 - Present

*Chief Technology Officer, Cofounder*

Product development of a cloud-connected microfluidic platform for tissue culture

### Braingeneers (Haussler, Salama, Teodorescu Labs), UC Santa Cruz

2024 - Present

*Postdoctoral Researcher*

Designing microfluidics for compound delivery to multi-electrode arrays

### Braingeneers (Haussler, Salama, Teodorescu Labs), UC Santa Cruz

2019 - 2024

*Graduate Researcher*

Developed custom electrophysiology, optogenetics, microfluidic devices and hardware

Developed generalized IoT device software and influenced the design of lab cloud infrastructure

### Braingeneers (Haussler, Salama, Teodorescu Labs), UC Santa Cruz

2017 - 2019

*Undergraduate Researcher*

Created mechanical components for automated biological imaging platform

Designed and manufactured plastic and ceramic 3D printed fluidic devices for organoid culture

### Riedel-Kruse Lab, Stanford University

June - July 2015

*Robotics Research Intern*

Created Lego pipetting robot designs with automated experiments for STEM curriculum

Demonstrated dilution gradient, fluid density, and droplet generation using Lego robot

## PUBLICATIONS

**Voitiuk, K.**, Seiler, S.T., de Melo, M.P., Geng, J., van der Molen, T., Hernandez, S., Schweiger, H.E., Severson, J.L., Parks, D.F., Robbins, A., Torres-Montoya, S., Ehrlich, D., Elliott, M.A.T., Sharf, T., Haussler, D., Mostajo-Radji, M.A., Salama, S.R., Teodorescu, M., 2025. **A feedback-driven brain organoid platform enables automated maintenance and high-resolution neural activity monitoring.** *Internet of Things* 33, 101671. <https://doi.org/10.1016/j.iot.2025.101671>

Hernandez, S., Schweiger, H.E., Cline, I., Kaurala, G.A., Robbins, A., Solis, D., Geng, J., Molen, T., van der, Reyes, F., Asogwa, C.N., **Voitiuk, K.**, Chini, M., Rolandi, M., Salama, S.R., Colquitt, B.M., Sharf, T., Haussler, D., Teodorescu, M., Mostajo-Radji, M.A., 2025. **Self-Organizing Neural Networks**

in Organoids Reveal Principles of Forebrain Circuit Assembly. bioRxiv.

<https://doi.org/10.1101/2025.05.01.651773>

Lindhout, F.W., Szafranska, H.M., Imaz-Rosshandler, I., Guglielmi, L., Moarefian, M., **Voitiuk, K.**, Zernicka-Glover, N.K., Boulanger, J., Schulze, U., Sánchez, D.J.L.-D., Minnick, J., Teodorescu, M., Lancaster, M.A., 2025. **Calcium dynamics tune developmental tempo to generate evolutionarily divergent axon tract lengths.** bioRxiv. <https://doi.org/10.1101/2024.12.28.630576>

Andrews, J.P., Geng, J., **Voitiuk, K.**, Elliott, M.A.T., Shin, D., Robbins, A., Spaeth, A., Wang, A., Li, L., Solis, D., Keefe, M.G., Sevetson, J.L., Jesus J.R., Donohue, K.H., Larson, H., Ehrlich, D., I. Auguste, K.I., Salama, S.R., Sohal, V., Sharf, T., Haussler, D., Cadwell, C.R., Schaffer, D.V., Chang, E.F., Teodorescu, M., Nowakowski, T.J., 2024. **Multimodal evaluation of network activity and optogenetic interventions in human hippocampal slices.** Nat Neurosci 1–13. <https://doi.org/10.1038/s41593-024-01782-5>

Robbins, A., Schweiger, H.E., Hernandez, S., Spaeth, A., **Voitiuk, K.**, Parks, D.F., Molen, T. van der, Geng, J., Sharf, T., Mostajo-Radji, M.A., Haussler, D., Teodorescu, M., 2024. **Goal-Directed Learning in Cortical Organoids.** bioRxiv. <https://doi.org/10.1101/2024.12.07.627350>

Elliott, M.A.T., Andrews, J.P., Molen, T. van der, Geng, J., Spaeth, A., **Voitiuk, K.**, Core, C., Gillespie, T., Sinervo, A., Parks, D.F., Robbins, A., Solís, D., Chang, E.F., Nowakowski, T.J., Teodorescu, M., Haussler, D., Sharf, T., 2024. **Pathological microcircuits initiate epileptiform events in patient hippocampal slices.** bioRxiv. <https://doi.org/10.1101/2024.11.13.623525>

Geng, J., **Voitiuk, K.**, Parks, D.F., Robbins, A., Spaeth, A., Sevetson, J.L., Hernandez, S., Schweiger, H.E., Andrews, J.P., Seiler, S.T., Elliott, M.A.T., Chang, E.F., Nowakowski, T.J., Currie, R., Mostajo-Radji, M.A., Haussler, D., Sharf, T., Salama, S.R., Teodorescu, M., 2024. **Multiscale Cloud-based Pipeline for Neuronal Electrophysiology Analysis and Visualization.** bioRxiv. <https://doi.org/10.1101/2024.11.14.623530>

Elliott, M.A.T., Schweiger, H.E., Robbins, A., Vera-Choqueccota, S., Ehrlich, D., Hernandez, S., **Voitiuk, K.**, Geng, J., Sevetson, J.L., Core, C., Rosen, Y.M., Teodorescu, M., Wagner, N.O., Haussler, D., Mostajo-Radji, M.A., 2023. **Internet-Connected Cortical Organoids for Project-Based Stem Cell and Neuroscience Education.** eNeuro 10. <https://doi.org/10.1523/ENEURO.0308-23.2023>

Park, Y., Hernandez, S., Hernandez, C.O., Schweiger, H.E., Li, H., **Voitiuk, K.**, Dechiraju, H., Hawthorne, N., Muzzy, E.M., Selberg, J.A., Sullivan, F.N., Urcuyo, R., Salama, S.R., Aslankoochi, E., Knight, H.J., Teodorescu, M., Mostajo-Radji, M.A., Rolandi, M., 2024. **Modulation of neuronal activity in cortical organoids with bioelectronic delivery of ions and neurotransmitters.** Cell Reports Methods 4. <https://doi.org/10.1016/j.crmeth.2023.100686>

Baudin, P. V., Sacksteder, R. E., Worthington, A. K., **Voitiuk, K.**, Ly, V. T., Hoffman, R. N., Elliott, M. A. T., Parks, D. F., Ward, R., Torres-Montoya, S., Amend, F., Duran, N. M., Vargas, P. A., Martinez, G., Ramirez, S. M., Alvarado-Arnez, L. E., Ehrlich, D., Rosen, Y. M., Breevoort, A., Schouten, T., Kurniawan, S., Haussler, D., Teodorescu, M., Mostajo-Radji, M. A., 2022. **Cloud-Controlled Microscopy Enables Remote Project-Based Biology Education in Underserved Latinx Communities.** Heliyon, vol. 8, no. 11. <https://doi.org/10.1016/j.heliyon.2022.e11596>

Parks, D.F., **Voitiuk, K.**, Geng, J., Elliott, M.A.T., Keefe, M.G., Jung, E.A., Robbins, A., Baudin, P.V., Ly, V.T., Hawthorne, N., Yong, D., Sanso, S.E., Rezaee, N., Sevetson, J., Seiler, S.T., Currie, R., Pollen, A. A., Hengen, K.B., Nowakowski, T.J., Salama, Mostajo-Radji, M. A., S.R., Teodorescu, M., Haussler, D., 2021. **IoT Cloud Laboratory: Internet of Things Architecture for Cellular Biology.** Internet of Things 2022, 20, 100618. <https://doi.org/10.1016/j.iot.2022.100618>

**Voitiuk, K.**, Geng, J., Keefe, M.G., Parks, D.F., Sanso, S.E., Hawthorne, N., Freeman, D.B., Currie, R., Mostajo-Radji, M.A., Pollen, A.A., Nowakowski, T.J., Salama, S.R., Teodorescu, M., Haussler,

D., 2021. **Light-weight Electrophysiology Hardware and Software Platform for Cloud-Based Neural Recording Experiments**. J. Neural Eng. <https://doi.org/10.1088/1741-2552/ac310a>

Ly, V.T., Baudin, P.V., Pansodtee, P., Jung, E.A., **Voitiuk, K.**, Rosen, Y., Willsey, H.R., Mantalas, G.L., Seiler, S.T., Selberg, J.A., Cordero, S.A., Ross, J.M., Pollen, A.A., Nowakowski, T.J., Haussler, D., Mostajo-Radji, M.A., Salama, S., Teodorescu, M., 2021. **Picroscope: Low-Cost System for Simultaneous Longitudinal Biological Imaging**. Communications Biology. <https://doi.org/10.1038/s42003-021-02779-7>

Gerber, L.C., Calasanz-Kaiser, A., Hyman, L., **Voitiuk, K.**, Patil, U., Riedel-Kruse, I.H., 2017. **Liquid-handling Lego robots and experiments for STEM education and research**. PLOS Biology 15, e2001413. <https://doi.org/10.1371/journal.pbio.2001413>

## PATENT APPLICATIONS

K. Voitiuk, M. Teodorescu, J. Sevetson, **“System and method for optogenetics stimulation of neural tissues on microelectrode arrays,”** US20250198982A1, Jun. 19, 2025

K. Voitiuk, D. H. Haussler, and M. Teodorescu, **“System and method for biological and hybrid neural networks communication,”** US20230104995A1, Apr. 06, 2023

K. Voitiuk, J. Geng, R. Currie, and M. Teodorescu, **“Electrophysiology system and method for neural recording,”** US20220361802A1, Nov. 17, 2022

V. Ly et al., **“System and method for simultaneous longitudinal biological imaging,”** US20220357566A1, Nov. 10, 2022

## TECHNICAL SKILLS

|                        |   |
|------------------------|---|
| <b>Languages</b>       | Python, C, C++, Java, Bash, MATLAB  |
| <b>Approaches</b>      | Machine Learning, Networks Programming, Concurrent Programming              |
| <b>Web/Markup</b>      | L <sup>A</sup> T <sub>E</sub> X, Markdown, HTML, CSS                        |
| <b>Tools/Platforms</b> | UNIX, Git, Jupyter, Docker, Kubernetes, AWS                                 |
| <b>Electronics</b>     | FPGA (Verilog), Printed Circuit Board Design                                |
| <b>Mechanical</b>      | 3D Modeling (Autodesk Inventor, Fusion), 3D Printing/Rapid Prototyping, CNC |

## TEACHING EXPERIENCE

### University of California, Santa Cruz

Alisal High School AP Biology, Mentor/Guest Lecturer, *Fall/Winter 2021-22; Winter/Spring 2022-23*  
Scientific Principles of Life (BME 18), Teaching Assistant, *Fall 2021*

Robot Automation (ECE 8), Guest Lecture, *Fall 2021*

Genomics Institute Research Mentoring Internship (RMI) program, Mentor, *Fall 2020 - Spring 2021*

NeuroTechSC, Technical and Research Advisor, *Spring 2020 - Spring 2021*

Scientific Principles of Life (BME 18), Course Developer & Course Assistant, *Summer 2018 - Fall 2018*

Computer Systems and C Programming (CMPE 13/L), Tutor/Grader, *Winter 2017*

Computer Systems and Assembly Language (CMPE 12/L), Tutor/Grader, *Fall 2016*

### Graham Middle School

Robotics Team Mentor, *September - November 2014*

## **POSTERS & PRESENTATIONS**

2025 TU Wien MEA2025 (Poster)  
2024 NHGRI Centers of Excellence in Genomics Science, Annual Grantee Meeting (Flashtalk, Poster)  
2024 SfN Annual Conference (Poster)  
2024 20th Annual Graduate Research Symposium (Poster)  
2024 MaxWell Biosystems 3rd In-Vitro 2D & 3D Neuronal Networks Summit (Invited Speaker)  
2023 NHGRI Centers of Excellence in Genomics Science, Annual Grantee Meeting (Flashtalk, Poster)  
2023 MaxWell Biosystems 3rd In-Vitro 2D & 3D Neuronal Networks Summit (Invited Speaker)  
2023 ARCS Supernova Scholar Celebration & Symposium (Poster and Video)  
2023 NHGRI Research Training and Career Development Annual Meeting (Poster)  
2022 CSHL Meeting: Development and 3D Modeling of the Human Brain (Poster)  
2022 SfN Annual Conference (Poster)  
2022 Asilomar Bioelectronics Symposium (Poster)  
2022 PBSE Annual Conference (Poster)  
2022 18th Annual Graduate Research Symposium (Talk)  
2021 NHGRI Centers of Excellence in Genomics Science, Annual Grantee Meeting (Flashtalk)  
2021 PBSE Annual Conference (Poster)  
2021 NHGRI Research Training and Career Development Annual Meeting (Poster)  
2020 PBSE Annual Conference (Poster)  
2019 UCSC Graduate Society of Women Engineers (Guest Talk)  
2019 Braingeneers Presentation for UCSC Dean's Council  
2019 Genomics Institute Open House Braingeneers Presentation  
2018 Braingeneers UC San Francisco Retreat Presentation  
2019 Genomics Institute Science Meeting Research Presentation  
2018 Symposium for Undergraduate Research at UCSC (Poster)  
2018 Braingeneers Schmidt Grant Kick-off Retreat Presentation  
2018 Koret Research Slam (Poster)  
2018 Braingeneers Presentation for NSF Visitor Jim Kurose  
2018 UCSC Baskin School of Engineering Graduation Open House (Poster)  
2018, 2019 UCSC Alumni Weekend (Poster)  
2017, 2018, 2019 Braingeneers Presentation for Genomics Institute  
2017 Braingeneers Presentation Talk for UCSF Visitors at UCSC  
2017 Braingeneers Presentation Talk at UCSF

## **HONORS & AWARDS**

2025-26 UC Innovation Catalyst Grant  
2023-24 University of California President's Dissertation-Year Fellowship  
2022-23 ARCS Foundation Award, Agilent Technologies Scholar  
2020-21, 2022-23 UCSC Genome Sciences NHGRI T-32 Trainee  
2018-19 Koret Scholarship  
2015, 2016, 2017, 2018 Dean's Honors List  
2015 Impressive Participation in the 2015 US National Chemistry Olympiad Local Competition

## **LANGUAGES**

English (fluent), Russian (native), Ukrainian (native), French (limited working)