


# WIKTORIA PAWLAK

## CONTACT

 Berkeley, California | [w.a.pawlak@berkeley.edu](mailto:w.a.pawlak@berkeley.edu)  
[LinkedIn](#), [Google Scholar](#), [Portfolio](#), [Thesis Modeling](#)  
M.Eng. in Bioengineering, UC Berkeley (2025)

## RESEARCH & ENGINEERING EXPERIENCE

### RESEARCH ENGINEER – CAPSTONE PROJECT – CARDIOMYOCYTE FUNCTIONAL RESPONSE TO PIEZOELECTRIC SUBSTRATES BERKELEY, USA

UC Berkeley, Fung Institute for Engineering Leadership | September 2025 – Present

- Testing piezoelectric polymeric films under cyclic strain to evaluate their effects on cultured cardiomyocyte behavior and function (heart failure therapy, patent-pending).
- Implementing experimental protocols: cardiomyocyte culture, substrate stimulation, and functional assays (electrical/mechanical response).
- Developing computational models to analyze bioelectric modulation in cardiac tissue.

Supervisors: Prof. Hossainy & Prof. Conboy

### INDEPENDENT RESEARCHER – BIOELECTRICITY & REGENERATION WARSAW, POLAND

Warsaw Polytechnic Physics Dept., Independent | January 2025 – Present

- Focus: Bioelectricity; Prepatterns; Regenerative Medicine; Collaboration on Tumor Treating Fields and guiding regeneration of cells; leading development of hardware; built MVP for image reconstruction software for cells; developing software for bioelectric morphospace guidance (regeneration, biobotcs, tumors etc.)

### RESEARCH FELLOW THESIS – BIOELECTRICITY & REGENERATION BOSTON, USA

Michael Levin’s Lab, Allen Discovery Center at Tufts University | January 2025 – July 2025

- Simulated bioelectrical transitions in glioblastoma using evolutionary algorithms to see how electrical patterns and prepatterns can guide regenerative outcomes; preparing for Tumor Treating Fields research; developed a new cell model

### COMPUTER VISION AND AI HARDWARE ENGINEER INTERN SAN FRANCISCO, USA

Rex.fit (YC23) | October 2024 – February 2025

- Trained depth estimation algorithms focusing on nutrition estimation analysis using embedded CV.
- Hardware: Prototyped energy storage in Drop device via capacitors.

### NEUROCOMPUTATIONAL RESEARCHER – BRAIN INTERFACES REMOTE, USA

ni2o | July 2023 – January 2025

- ni2o continues MIT’s Mind Machine Project (Prof. Newton Howard) – developing a neuromorphic brain-computer interface for restoring neural connections.
- Conducting research on neuromorphic computing, focusing on guided regeneration, neural decoding, and biocompatibility for brain-computer interfaces (BCI) – see Google Scholar
- Developed early software for early detection of Alzheimer’s and Parkinson’s using EEG data, applying RNNs and CNNs for data analysis and predictive spatial modeling.

Colaboration with: Dr. Richard Wirt (Software Development and Machine Learning), Sols Miziev (Brain Implants and Neuromorphic Computing)

### NEUROSCIENCE RESEARCH ENGINEER (FELLOW) BASEL, SWITZERLAND

Friedrich Miescher Institute for Biomedical Research (Novartis) | July 2024 – September 2024

- Built imaging pipeline aligning EM, LM, and calcium data for zebrafish olfaction experiments.
- Automated axon/dendrite reconstruction using FFN-like methods for connectome mapping

### AI AND NEUROSCIENCE RESEARCH INTERN – INDEPENDENT STUDY DELFT, NETHERLANDS

TU Delft | November 2022 – May 2023

- Bought own EEG setup to self-learn data analysis
- After few months went under supervision of Prof. Derek Lomas on personal project involving EEG and Deep Learning to reconstruct EEG signals to sound and images (work [initiated BrainBits project](#))

## EDUCATION

### University of California, Berkeley

Berkeley, USA

Master of Engineering, Bioengineering  
Rafał Brzoska Foundation Scholar top 1%  
MEng Opportunity Award

### Tilburg University

Tilburg, Netherlands

Bachelor in Cognitive Neuroscience and AI

### MIT Innovation Technology Bootcamp

[Building](#). (check pitch and intro!) a technological [venture](#)  
Cambridge, Massachusetts

### Utrecht University (UCR)

Middelburg, Netherlands

Bachelor in Cognitive Neuroscience

### Scholar of Watson Institute Fall semester start-up accelerator

Colorado, Boulder

## SKILLS

Programming: Python, PyTorch, R, MATLAB, SQL, OpenCV, Git  
Tools: EEG/EM microscopy, LaTeX, Figma, Adobe Suite, Fusion 360 basics  
Concepts: Bioelectricity, Implants, Bioelectric Modulation, Neuromorphic Computing, Neural Imaging, BCI, Regenerative Medicine

## AWARDS AND PRESENTATIONS

- MEng Opportunity Award, UC Berkeley — 2025
- Rafał Brzoska Foundation Scholar — 2025
- G.Tech BR41N Hackathon — 3rd Place (AIXD 2024 project presentation) — 2023/2024
- IJCNN 2024 — Conference Paper (presented) — 2024
- GovTech Poland — Finalist — 2021
- Watson Institute Scholar (funded) — 2020
- Saint Nicolas Foundation Scholar — 2019

## LANGUAGES

Polish (Native); English (C2); Arabic (A1)

## TECHNICAL PROJECTS

### DEVELOPMENT OF NEUROPONG: BRAIN-COMPUTER INTERFACE GAME (2023)

- Processed real-time EEG data for game control using SciPy and NumPy; Applied K-means; User friendly UX-design

### G.TECH BR41N HACKATHON 3RD PLACE WINNER 2023

- In multidisciplinary team transformed EEG recordings into audio using a diffusion model guided by textual prompts.
- Created music modulated by brain waves, with potential therapeutic applications.  
[Project presentation](#)
- Presented at AIXD 2024 Amsterdam

## NEUROEVOLUTION GAME AGENT (NEAT - SLIMEVOLLEY)

- Evolved controllers with NEAT (12→6 feature reduction), plus co-evolved reward shaping; added speciation, logging, and visualizations.
- Reached 73.3% win-rate vs built-in AI after fixing reward-sign bug and simplifying physics/penalties for stable learning.

## AI SCIENTIST — BIOELECTRIC GLOBLASTOMA MODELING

- Automated pipeline: OpenAlex literature mining → hypothesis → multi-cell Hodgkin-Huxley sims with Cx43 coupling → analysis → LaTeX draft.
- Ran sweeps (Kir4.1, V<sub>mem</sub>, Cx43) and surfaced intervention regimes that normalize bioelectric gradients; produced plots + ranked candidates.

## TEXT-TO-KANJI GENERATOR (STABLE DIFFUSION FINE-TUNE)

- Fine-tuned SD v1-4 on cleaned (character, meaning) pairs (diffusers/accelerate), replacing noisy prompt metadata.
- Inference tuning (≈70-150 steps, guidance≈10, negative prompts) produced single-glyph, semantically correct outputs on unseen meanings.

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## ENTREPRENEURIAL PROJECTS

### ENTREPRENEUR FIRST FUTURE48 (2024)

- Selected as one of the top female innovators in Europe for a 48-hour tech innovation event.
- Collaborated with industry experts to develop a prototype solution focused on electroceuticals

### FINALIST, GOVTECH POLAND (2021)

- Participated in a national competition organized by the Polish Prime Minister's office, [designing solution](#) for involving youth in government.

### TOP 5 FINALIST, THINKATHON AGORIZE INTERNATIONAL (2020)

- Selected as one of the best five projects worldwide for proposing a COVID-19 mitigation technological solution in Poland.
- [Introducing an application for grocery shopping](#) that helps support the local economy.

### ORGANIZER OF ENTREPRENEUR CONFERENCE (2019)

- Awarded a 12-month scholarship to organize a conference.
- Led a team of 5 to organize a conference for 120 students from rural areas, securing partnerships and coordinating logistics.

### MENTOR AT ZWOLNIENI Z TEORII 2019-2022

- Supervised up to 20 student teams per edition across Poland.
- Guided teams through the venture implementation cycle, including WBS, KPIs, risk management, Gantt charts, and cost control.

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## RESEARCH INTEREST

- Healthcare and military application of AI
- Connectomics and neuron reconstruction
- neuromorphic computing for brain implants
- Brain implant chip design
- Saving memories in brain implant
- Image reconstruction from brain activity
- Biobots/Xenobots
- Bioelectricity

## EXECUTIVE ASISTANT, RESEARCH SUPPORT REMOTE, USA

PlayPower Labs | August 2023 – March 2024

- Project management of projects in AI, Design and Neuroscience
- Creating benchmarks (Python) for evaluating LLM in math teaching LLM bot
- Training Image Generation models for external partners (fashion industry)
- Writing grant proposals, supervising Masters students in their AI related internship program
- Organizing AI conference AIXD2024 Amsterdam

## BUSINESS DEVELOPMENT AND PR REMOTE, GERMANY

Yuri, remote | September 2022 – June 2023

- Yuri is a space biotech company that uses the microgravity environment of space to develop and manufacture superior biotech products working with partners like MIT, ESA or DLR.
- Supporting sales engineer from providing a quotes, PO, Delivery Notes, managing international export and other documentation. Managing technical support.
- Analyzed Google Ads and Analytics to optimize sales strategies.
- Leading, designing and executing long term communication strategy including rebranding.
- Coordinating press releases and cooperating with bio team while establishing first partnership between a commercial space company and a biomedical research institute worldwide.

## BUSINESS DEVELOPMENT AND PR INTERN MECKENBEUREN, GERMANY

yuri | June 2022 – August 2022

- Preparing booths for conferences like ISSR&D, JP Morgan to reach potential partners and customers.
- Conducting customer and sale data analysis for Random Positioning Machine's long term sales plan.
- Self learned data analytics to improve business development metrics and drive data driven decision making (market research, cleaning data, data visualization).
- Participated in sprint with bio team for competitive analysis in biotech fields to stay on top of market trends and obtain insights to drive internal growth for business validation.

## COMMUNITY/BUSINESS GROWTH WORKER, CONFERENCE SPEAKER AMMAN, JORDAN

Desert Bloom, European Solidarity Corps | April 2021 – August 2021

- Leading training courses for female refugees (critical thinking, creative thinking, change management).
- Speaker at international conference 'Invisible ForeWomen' in Amman (100+ participants from Europe & the MENA Region).

## SCHOLAR OF WATSON INSTITUTE BOULDER, COLORADO

Co-founder Fitnances | August 2020 – December 2020

- Selected as a scholar with 10% of international-wide acceptance for 16 weeks venture accelerator program based on leadership potential, curiosity, and creativity.
- Co-founded financial education [start-up](#) in Kenya (lean startup methodology).
- Secured funding through grant writing, obtaining the highest (top 1%) seed funds for the start-up.
- Developed [marketing](#), strategy, built product, launched website and pilot program.

## PROJECT MANAGER, CREATOR OF SOCIAL CAMPAIGN "UPS MY BOOBS" POZNAŃ, POLAND

Henkel's program REBELKI | May 2019 – November 2019

- Selected by Henkel as one of 20 participants nationwide for a 5-month leadership program for young, socially active women and co-founded the social campaign "UPS my BOOBS" to break taboos and promote breast cancer prevention.
- Reached over 60,000 women through social media, interviews with doctors.
- Received invitation to [national TVP Poland media](#).
- Leading team by distributing tasks to meet campaign deadlines.

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## PUBLICATIONS

PAWLAK, W. A., & HOWARD, N. (2025). NEUROMORPHIC ALGORITHMS FOR BRAIN IMPLANTS: A REVIEW. FRONTIERS IN NEUROSCIENCE, 19, 1570104. [HTTPS://DOI.ORG/10.3389/FNINS.2025.1570104](https://doi.org/10.3389/fnins.2025.1570104) [FIRST AUTHOR]

PAWLAK, W. A., ISIK, M., LE, D., DIKMEN, I. C. (2024). EXPLORING LIQUID NEURAL NETWORKS ON LOIHI-2. ACCEPTED TO IEEE DOI.ORG/10.48550/ARXIV.2407.20590].

ISIK, M., MIZIEV, S., PAWLAK, W., HOWARD, N. (2024). ADVANCING NEUROMORPHIC COMPUTING: MIXED-SIGNAL DESIGN TECHNIQUES LEVERAGING BRAIN CODE UNITS AND FUNDAMENTAL CODE UNITS. IN PROCEEDINGS OF THE IEEE WORLD CONGRESS ON COMPUTATIONAL INTELLIGENCE (IEEE WCCI 2024), INTERNATIONAL JOINT CONFERENCE ON NEURAL NETWORKS (IJCNN 2024). [ACCEPTED].

MIZIEV, S., PAWLAK, W. A., HOWARD, N. (2024). COMPARATIVE ANALYSIS OF ENERGY TRANSFER MECHANISMS FOR NEURAL IMPLANTS. FRONTIERS IN NEUROSCIENCE, 17. DOI: 10.3389/fnins.2023.1320441 [EQUAL CONTRIBUTION]

PAWLAK, W., RAYMON, T., DE MALEZIEUX DU HAMEL, C. (2023). PTSD'S IMPACT ON MENTAL TIME TRAVELING. YOUTH NEURO JOURNAL. MARCH 2023 EDITION. AVAILABLE AT: [\[URL OF THE JOURNAL'S MARCH EDITION\]](#). [NOT PEER REVIEWED, PART OF UNIVERSITY PROJECT]