SUSANNA WEBER

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EDUCATION

Vilcek Institute of Graduate Biomedical Sciences
PhD, Biomedical Imaging & Technology

Columbia University *December 2024*
Master of Science, Biomedical Engineering

University of California, Berkeley *May 2023*
Bachelor of Arts, Physics | Minor, Electrical Engineering and Computer Science (EECS)

Relevant Coursework: Principles of MRI, Principles of MRS, Deep Learning in Biomedical Imaging, Deep Learning for Signal Processing, PCB Engineering, Biostatistics, Data Structures, Thermodynamics, Quantum Mechanics

SKILLS

- **Languages:** Python, MATLAB, Java, C++
- **Libraries:** PyTorch, TensorFlow, NiBabel, Pydicom, TwixTools, Magpylib, OpenCV, Pandas
- **Other skills:** KiCad, Autodesk Fusion, COMSOL, Arduino, Git, LaTeX

RESEARCH EXPERIENCE

Electromagnetics Lab at NYU
Research Associate *September 2024 - Present*
- Designed and implemented an amplifier using **KiCad** to power a low-field active shimming system
- Optimized shim array design using a **genetic algorithm** for coil number and placement in **Python**

MR SCIENCE Lab at Columbia University
Graduate Student Researcher *August 2023 - September 2024*
- Modeled B_0 inhomogeneities in the heart and resulting image artifacts
- Designed multi-coil arrays for active shimming in **MATLAB**
- Simulated effect of different active shimming configurations on field homogeneity in the heart

GE Healthcare
Medical Imaging AI Intern *May 2022 – August 2022*
- Built **generative adversarial networks** for paired and unpaired MR to CT scan translation in **TensorFlow**
- Implemented **vision transformers** for segmentation and identification of anatomical structures in MR

Hellman Lab at UC Berkeley
Undergraduate Student Researcher *January 2021 – December 2022*
- Fabricated amorphous, multi-layer, ultra-thin films using magnetron sputtering
- Built **Python** interface to control closed-cycle system to cool samples to 3K in order to measure resistivity

Max Planck Institute for Physics
Summer Research Intern *May 2021 – July 2021*
- Worked with the MAGIC Telescope Group to expedite the assessment of atmospheric conditions
- Automated photometric filter system for the Magic Atmospheric Minion (MAM) in **Python**
- Collaborated with graduate students to integrate new photometric filtering into the MAM codebase

Garcia Lab at UC Berkeley
Undergraduate Student Researcher *July 2020 – January 2021*
- Simulated live imaging of gene transcription rates in fruit fly development using **MATLAB**
- Quantified number of active, transcribing cells in fruit fly embryos

- Compared simulated transcription to experimental data to identify false positives

HONORS AND AWARDS

Berkeley Physics-and-Astronomy Undergraduate Research Scholar *Spring 2021, Fall 2021, Fall 2022*
- Scholarship awarded to students for research proposals submitted in conjunction with a faculty member
- Presented results to 200+ faculty and students at the Berkeley Physics Undergraduate Poster Session

MANUSCRIPTS UNDER REVIEW

Weber S., Verghese G., Ianello C., *et al.* "Active Shimming for Low-Field Halbach Arrays – Initial Results". Submitted to: ISMRM & ISMRT Annual Meeting & Exhibition; 2025 May 10–15; Honolulu, Hawai'i.

Huang S. *et al.*, "ezyMRI: How to build an MRI machine from scratch - Experience from a four-day hackathon". Preprint at https://arxiv.org/abs/2411.11365 (2024).

SELECTED PROJECTS

Cardiac MRI Segmentation
Columbia University - Deep Learning for Biomedical Imaging *March 2024 – May 2024*
- Implemented attention U-Net in **Pytorch** for whole heart and ventricle segmentation
- Worked with NIFTI and DICOM image formats using **NiBabel, PyDicom,** and **OpenCV**
- Achieved accuracy scores on par with leading models for the Right Ventricle Segmentation Challenge

Liquid Engine Rocket Flight Computer
Space Technologies and Rocketry at Berkeley *August 2021 – May 2023*
- Designed, assembled, and tested PCBs for avionics systems using **KiCad** and **Arduino/C++**
- Wrote live telemetry and data analysis software for control and monitoring of combustion
- As avionics team lead, oversaw recruiting and training of new members as well as successful engine hot fire

Robotic Foosball Table
UC Berkeley - Introduction to Robotics *October 2021 - December 2021*
- Used **open-cv** to track ball and **pyserial** to interface with microcontroller and move goalie correspondingly
- Implemented signed bang-bang control algorithm in **Python** for actuation

TEACHING EXPERIENCE

Lab Assistant – Basic Semiconductor Circuits
Berkeley Student Learning Center *August 2022 – May 2023*

Physics Tutor – Introductory Electromagnetism, Waves, and Optics
Berkeley Student Learning Center *January 2022 – May 2022*

Physics Tutor – Introductory Physics
Berkeley Student Learning Center *August 2021 – December 2022*

SERVICE

Undergraduate Mentor
Berkeley Society of Physics Students *September 2021 - January 2022*
- Organized info sessions, socials, and study sessions for mentorship group of first-year and transfer students

Sustainability Commission Co-Chair
Associated Students of the University of California *May 2020 - May 2021*
- Organized sustainability-focused initiatives on campus in collaboration with the student government

Assistant Debate Coach

Oakland Military Institute *May 2019 - November 2019*

- Assisted coaches in setting up and administering the school's new debate team