

# Jessie Sheflin

(970)-829-7246 | JessieSheflin@u.northwestern.edu | <https://jessie.red>

## RESEARCH EXPERIENCE

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### Research Scientist at ElectroCeption

**Jun 2025-Present**

- Performed part-time contract work with a Fortune 10 company to conduct FEA and CV experiments *in silico*, conducting data analysis and communicating concepts across domains and teams

### Master's Researcher at SPICE Lab, Northwestern

**Sep 2024-Present**

- Implemented novel data processing method using PCA in Python to handle poor electrical contacts in a real-time ML-based medical imaging application, resulting in an arXiv publication
- Assembled end-to-end ML inference pipeline integrating Swift, C++, C#, and PyTorch for real-time hand pose prediction using multi-modal sensor fusion (electrical contacts + VR headset)
- Developed novel contrastive learning transformer-based model, leading to state-of-the-art hand pose prediction accuracy and an upcoming paper at a top-tier conference
- Programmed visualization applications for high-dimensional, temporal biomedical data in PyQT

### Undergraduate Researcher Grayson Lab, Northwestern

**Sep 2023-Jun 2025**

- Created mathematical frameworks for medical imaging using complex analysis, linear algebra, and FEA in MATLAB
- Orchestrated live demos and presented original research at the IEEE BSN 2024, CBEC 2024 and ICEBI-EIT-CNIBi 2025 conferences, resulting in multiple publications and a Best Student Paper award in competition against PhDs
- Co-invented three breakthrough technologies resulting in provisional patents for mathematical analysis of imaging resolution, high-dimensional biomedical data analysis, and advanced prosthetic sensor design

### Laboratory Technician for Pinkett Lab, Northwestern

**Sep 2021-Jun 2025**

- Executed, developed, and recorded SOPs for wet lab techniques
- Mentored and trained four work-study or PhD rotation students, developing their laboratory skills while supervising their work to ensure adherence to protocols and quality standards

## PUBLICATIONS

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**Sheflin, J.** et al., "Parametric EIT inversion with sparse model sampling," in Journal of Physics: Conference Series, IOP Publishing, 2025, p. 012020. <https://iopscience.iop.org/article/10.1088/1742-6596/3014/1/012020/meta>

**Best Student Paper**

**Sheflin, J.**, Onsager, C., Grayson, M., Resolution Maps: A Novel Metric for Electrical Impedance Tomography, *International Conference on Body Sensor Networks (BSN)*, Chicago, IL, USA, 2024

**Sheflin, J.** (2024). PODPose: Integrating Proper Orthogonal Decomposition and EITPose (Version 1). arXiv. <https://doi.org/10.48550/ARXIV.2412.08036>

## EDUCATION

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### M.S. in Computer Science, Northwestern University,

June 2025; GPA: 4.0/4.0

Thesis: Analysis Techniques for Electrical Impedance Tomography

Courses: Machine Learning, Operating Systems, UbiComp

### B.S. in Biomedical Engineering,

**Northwestern University,**  
June 2025; GPA: 3.9/4.0

Courses: Signals and Circuits, Computational Genomics, Biomedical Machine Learning

## TECHNICAL SKILLS

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### Programming:

Python (PyTorch, NumPy, TensorFlow), MATLAB, R, C, C++, Racket, Unix, Git

### Technologies:

Microcontrollers (Arduino, Eagle)

3D Modeling (Solidworks, Fusion, FreeCAD)

Photoshop/GIMP, Figma

Computational Genomics (STAR, RSEM, NGS, DAVID)

**Languages:** Spanish (fluent)

## HONORS & AWARDS

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### Biomedical Engineering Award for Research

Northwestern BME's highest award for research

### Fletcher Prize Finalist

For proposal and result of research grant

### Tau Beta Pi

Engineering Honor Society

### ICEBI-EIT-CNIBi 2025 Best Student Paper

For research & presentation