Eleftheria Anastasia Beres

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https://elliberes.me

Education

2024–	**University of Washington**, Seattle, WA Ph.D. in Computer Science and Engineering *In progress*
2021–2024	**Northwestern University**, Evanston, IL B.S. in Computer Science Summa Cum Laude; GPA: 3.99/4.00; Major GPA 4.00/4.00

Research Interests

Executable and algorithmic approaches to modeling biological systems; reproducibility, replicability, and reuse in computational, systems, and synthetic biology; computing education for disciplinary scientists

Research Experience

Sep 2024–Present — **Programming Languages and Software Engineering (PLSE) Group and Learning, Computing, Imagination (LCI) Lab**
Paul G. Allen School of Computer Science & Engineering, Seattle, WA
Research Assistant
Advisors: Michael D. Ernst, Amy J. Ko, R. Benjamin Shapiro

– Working on improving the reproducibility of Jupyter Notebooks for scientific work in the JupyterLab interactive development environment.
– Studying software engineering practices among disciplinary scientists specifically in the context of reproducibility, replicability, reuse, and correctness in computational science.

Dec 2021–Jun 2024 — **Leonard Lab**
Northwestern University Center for Synthetic Biology, Evanston, Il
Undergraduate Researcher
Advisors: Joshua Leonard

– Designed and implemented Python package for easy-to-use, rapid, batch flow cytometry data analysis for synthetic biologists.
– Experimentally characterized mammalian genetic circuit components for computer-aided design of mammalian genetic circuits.
– Characterized and analyzed synthetic transcription factors in mammalian cells.

Sep 2023–Jun2024 — **Xenobot Group**
Northwestern University Center for Robotics and Biosystems, Evanston, IL
Undergraduate Researcher
Advisor: Sam Kriegman

– Studied the impacts of simulated growth on rigid-body virtual creatures.
– Used genetic algorithms to evolutionarily optimize rigid-body robotics in a physics simulator.

Poster Presentations

2023	**Eleftheria Beres**, Kathleen Dreyer, Hailey Edelstein, Kate Dray, and Joshua Leonard. Pyflowbat: An open-source software package for performing high-throughput batch analysis of flow cytometry data. Poster presented at: EBRC Annual Meeting; 2023 Jun 5-6; Evanston, IL

Teaching Experience

Summer 2024 Peer Mentor[1]: **COMP_SCI 349 Machine Learning**
Department of Computer Science
Northwestern University, Evanston, IL

Spring 2024 Peer Mentor: **COMP_SCI 349 Machine Learning**
Department of Computer Science
Northwestern University, Evanston, IL

Winter 2024 Peer Mentor: **COMP_SCI 396/496 Artificial Life**
Department of Computer Science
Northwestern University, Evanston, IL

Fall 2023 Peer Mentor: **GEN_ENG 205-1 Engineering Analysis 1**
Department of Electrical and Computer Engineering
Northwestern University, Evanston, IL

Fall 2023 Peer Mentor: **BMD_ENG 220 Introduction to Biostatistics**
Department of Biomedical Engineering
Northwestern University, Evanston, IL

Winter 2023 Peer Mentor: **DATA_ENG 200 Foundations of Data Engineering**
Department of Computer Science
Northwestern University, Evanston, IL

Fall 2022 Peer Mentor: **BMD_ENG 220 Introduction to Biostatistics**
Department of Biomedical Engineering
Northwestern University, Evanston, IL

Awards & Honors

2024–2027 **ARCS Scholar**
ARCS Seattle Chapter, Seattle, WA

2024–2025 **Jeff Dean - Heidi Hopper Endowed Regental Fellowship**
Paul G. Allen School of Computer Science & Engineering, Seattle, WA

Jun 2024 **Outstanding Computer Science Senior**
Northwestern University Department of Computer Science, Evanston, IL

Summer 2023 **Summer Undergraduate Research Fellowship**
Northwestern University Department of Computer Science, Evanston, IL

Summer 2023 **Summer Undergraduate Research Grant**
Northwestern University Office of Undergraduate Research, Evanston, IL

Summer 2022 **Summer Undergraduate Research Grant**
Northwestern University Office of Undergraduate Research, Evanston, IL

Service & Organizations

Jan 2025–Present **oSTEM at UW**: Secretary
University of Washington, Seattle, WA

Jan 2025–Mar 2025 **Prospective Students Visit Days Scheduler**
Paul G. Allen School of Computer Science & Engineering, Seattle, WA

Dec 2024–Jan 2025 **Ph.D. Program Application Reader**
Paul G. Allen School of Computer Science & Engineering, Seattle, WA

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[1]Northwestern did not officially have undergraduate TA positions in the McCormick School of Engineering; instead, the positions were called "Peer Mentors."

Sep 2024–Dec 2024 **Pre-Application Mentor Service (PAMS)**: PAMS Mentor
Paul G. Allen School of Computer Science & Engineering, Seattle, WA

Sep 2022–Sep 2023 **NU Biomedical Engineering Society**: Secretary
Northwestern University Department of Biomedical Engineering, Evanston, IL

Sep 2021–Sep 2022 **NU Biomedical Engineering Society**: Public Relations Chair
Northwestern University Department of Biomedical Engineering, Evanston, IL

Relevant Coursework

University of Washington

Spring 2025 **GENOME 569 Bioinformatics Workflows for High-Throughput Sequencing Experiments**
Grade: *In progress* — Skills: Learning and implementing high-throughput bioinformatics workflows for single cell RNA sequencing experiments.

Spring 2025 **CSE 587 Advanced Systems and Synthetic Biology**
Grade: *In progress* — Skills: Learning about recent developments in synthetic biology.

Winter 2025 **CSE 503 Software Engineering**
Grade: 4.00 — Skills: Learned program analysis methods and software engineering research topics.

Northwestern University

Spring 2024 **COMP_SCI 324 Dynamics of Programming Languages**
Grade: 4.00 — Skills: Performed mathematical modeling of programming languages; created redex model of the semantics of the future annotation in MultiLisp based on "The Semantics of Future" by Cormac Flanagan and Matthias Felleisen.

Winter 2024 **COMP_SCI 397 Computer Science Education**
Grade: 4.00 — Skills: Learned constructionist approaches to CS education; created tool to demonstrate the similarities between spreadsheets and traditional programming.

Fall 2023 **COMP_474 Probabilistic Graphical Models**
Grade: 4.00 — Skills: Covered statistical estimation and graphical models including Naive Bayes models, Markov Networks, Factor Graphs, Gaussian Mixture Models, Expectation Maximization, Latent Dirichlet Allocation.

Winter 2023 **ES_APPM 346 Modeling and Computation in Science and Engineering**
Grade: 4.00 — Skills: Learned and implemented numerical methods for solving differential equations including stochastic differential equations.

Fall 2022 **BMD_ENG 311 Computational Genomics**
Grade: 4.00 — Skills: Learned bioinformatics methods for analyzing single cell RNA sequencing data; analyzed previously-published genomics data from the NCBI GEO database from Zika and Dengue infections to identify differentially expressed genes.

Skills

Computing Unix; Python; C; TypeScript and JavaScript; Java; Go; Julia.

Machine learning Implementing neural networks from scratch; genetic algorithms; probabilistic graphical models.

Bioinformatics Performing scRNA-seq analysis; automating bioinformatics pipelines with Bash, Python, and R; flow cytometry analysis.

Biological wetlab Mammalian cell culture; plasmid design and prep; HEK cell transfection; flow cytometry.