Derin Gezgin

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Education

Connecticut College, New London, Connecticut, USA — August 2023 – May 2027
Bachelor of Arts in Computer Science and in Statistics and Data Science — **GPA: 4.0/4.0**
Honors Study: Diagnosing and Repairing Representation Bottlenecks in Learned-Descriptor Quality-Diversity

Research Experience

Neurobotics Lab — March 2026 – Present
Advisor: Prof. Nick Cheney — University of Vermont
Studying learned behavior descriptors in quality-diversity search and how training history shapes adaptation

- Developed AURORA-VC [8] with variance and covariance penalties, showing that identical reconstructions can yield different retained policies and that conditioning can improve search and keep high-performing policies in the archive longer
- Designing experiments on how training history shapes adaptation to new tasks in similarly performing neural networks

Autonomous Agent Learning Lab — July 2024 – Present
Advisors: Prof. Gary B. Parker & Jim O'Connor — Connecticut College
Investigating evolution-inspired methods for game AI and evolutionary robotics

- Built DSLE [7], a containerized Gymnasium-style learning environment for all 22 *Dark Souls Remastered* bosses
- Co-developed SCOPE [2, 4], an evolutionary method that uses image compression techniques to learn game controllers and robot walking gaits, outscoring reinforcement learning baselines in Atari *Space Invaders* with over 750× fewer parameters
- Co-built and maintained the lab's HTCondor cluster for distributed training and evaluation across 65 shared computers

ASSET Center & Software Engineering Group — May 2025 – March 2026
Advisors: Prof. Mayur Naik & Prof. Saikat Dutta — University of Pennsylvania & Cornell University
Research on Java vulnerability detection and LLM-assisted proof-of-concept generation

- Created PoC-Gym [6] to evaluate the reliability of LLM-generated proofs of concept on 20 known Java vulnerabilities
- Demonstrated common failure modes in LLM-generated proofs of concept through dynamic trace analysis
- Led IRIS's Docker integration and published images for 189 CWE-Bench-Java projects

Informatics Lab — May 2024 – August 2025
Advisor: Prof. Timothy James Becker — Connecticut College
Work on applications of computer vision in environmental science to monitor streamflow and support aquatic habitat conservation

- Built an image classification pipeline using temporal image enhancement to classify water flow with 90% accuracy [3]

Conference Publications & Manuscripts

[9] **Sequential Gini Estimation with Grouped Ratios in Big-Data Regimes with Applications in Various Fields**
Derin Gezgin, Yan Zhuang
To be submitted to Sequential Analysis

[8] **Geometric Regularization of Learned Behavior Spaces in Unsupervised Quality-Diversity Optimization**
Derin Gezgin, Nick Cheney
Under review

[7] **DSLE: A Learning Environment for Dark Souls Boss Encounters**
arXiv **Derin Gezgin**†, Jim O'Connor†, Tanner Goodwin, Gary B. Parker († Equal contribution)
2608.09902 *AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment, 2026* [Oral, **Best Paper Award**]

[6] **PoC-Gym: Towards More Reliable LLM-Assisted Proof-of-Concept Exploit Generation**
arXiv **Derin Gezgin**, Amartya Das, Shinhae Kim, Zhengdong Huang, Nevena Stojkovic, Claire Wang
2602.04165 *Second Workshop on Large Language Models For Generative Software Engineering, 2026*

[5] **Evolutionary Optimization of Deep Learning Agents for Sparrow Mahjong**
arXiv Jim O'Connor, **Derin Gezgin**, Gary B. Parker
2508.07522 *AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment, 2025*

[4] **Playing Atari Space Invaders with Sparse Cosine Optimized Policy Evolution**
arXiv Jim O'Connor, Jay B. Nash, **Derin Gezgin**, Gary B. Parker
2508.08526 *AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment, 2025*

[3] **A framework for river connectivity classification using temporal image processing and attention based neural networks**
arXiv Timothy James Becker, **Derin Gezgin**, Jun Yi He Wu, Mary Becker
2502.00474 *ACM Conference on Computing and Sustainable Societies, 2025*

[2] **SCOPE for Hexapod Gait Generation**
arXiv Jim O'Connor, Jay B. Nash, **Derin Gezgin**, Gary B. Parker
2507.13539 *IJCCI Conference on Evolutionary Computation and Theory and Applications, 2025*

[1] **Evolving Neural Controllers for Xpilot-AI Racing Using NEAT**
arXiv Jim O'Connor, Nicholas Lorentzen, Gary B. Parker, **Derin Gezgin**
2507.13549 *IJCCI Conference on Evolutionary Computation and Theory and Applications, 2025*

Talks & Presentations

I presented all of my published papers at their respective conferences, additional presentations are listed below

DSLE: A Learning Environment for Dark Souls Boss Encounters
- Oral presentation at the Research Seminar of the Department of Computer Science at Connecticut College — May 2026

Sparse Cosine Optimized Policy Evolution
- Poster presentation at Connecticut College's 2025 Fall Weekend — September 2025
- Oral presentation at the colloquium of the Connecticut College Summer Science Research Institute — July 2025

Evolutionary Optimization of Deep Learning Agents for Sparrow Mahjong
- Oral presentation at the Research Seminar of the Department of Computer Science at Connecticut College — May 2025

Machine Learning Image-Based In-Stream Water Flow Classification
- Poster presentation at Northeast Aquatic Biologists Conference — February 2025
- Poster presentation at Connecticut College's 2024 Fall Weekend — October 2024
- Oral presentation at the colloquium of Connecticut College Summer Science Research Institute — June 2024

Teaching Experience

Undergraduate Teaching Assistant — February 2024 – Present
Connecticut College, New London, Connecticut, USA — *F: Fall Semester & S: Spring Semester & U: Summer Session*

Completed over **800** hours of teaching assistance across **9** courses, supporting **250** unique students

COM110	Introduction to Computer Science & Problem Solving	S24, F24, S25, U25, F25, S26
COM212	Data Structures	F24, S25, F25, S26
COM219	Computer Organization	F25
COM304	Algorithms	F26, S27
COM316	Artificial Intelligence	F26
COM322	Computer Vision	S26
STA107	Introduction to Statistics	S26
STA207	Advanced Regression Techniques	F25, F26
STA234	Statistical Computing with R	S27

Head Teaching Assistant — May 2026 – Present
Connecticut College, New London, Connecticut, USA
Coordinating **25** teaching assistants and developing the Department of Computer Science's **five-figure** TA budget proposal

Introduction to Computer Science TA Manager — May 2025 – May 2026
Connecticut College, New London, Connecticut, USA
Coordinated the COM110 teaching assistant team, scheduled TA sessions, and managed course grading

Honors & Awards

Throughout my time at Connecticut College, I have secured US$16,817.23 in research funding and US$9,778.36 plus CA$750 in conference funding through grant and fellowship applications, and received US$120,000 in merit-based scholarships

ACM Student Travel Grant — July 2025
Awarded CA$750 to support attendance at ACM COMPASS 2025

Summer Science Research Institute — Summer 2024 & Summer 2025
Awarded US$5,884.71 (2024) and US$7,932.52 (2025) to support summer research at Connecticut College

Dean's High Honors — Every Semester
Awarded for meeting the GPA threshold calculated based on the top 15% of graduates from the preceding four years

Sophomore & Junior Computer Science Awards — 2024-2025 & 2025-2026
Departmental award for excellence in Computer Science

Sophomore & Junior Julia Wells Bower Prizes — 2024-2025 & 2025-2026
Awarded for distinction in mathematics and offered anonymously in honor of Julia Wells Bower, Professor Emeritus of Mathematics

Service and Academic Contributions

IEEE Symposium on Computational Intelligence in Artificial Life and Cooperative Intelligent Systems — October 2026
Reviewer

Mathematical Statistics with Resampling and R, 4th Edition — Spring 2026
Acknowledged Contributor; submitted errata, and pedagogical feedback on undergraduate usability for the forthcoming edition

ACM Conference on Computing and Sustainable Societies — July 2025
Student Volunteer

Connecticut College Computer Science Student Advisory Board — August 2024 – May 2025
Diversity Chair

Skills

Languages: English (Fluent) & French (Fluent, C1) & Turkish (Native)
Programming Languages: Python, Java, R, MATLAB, LaTeX, Chez Scheme, Bash
Frameworks and Libraries: PyTorch, TensorFlow, scikit-learn, NumPy, JAX, Pandas, QDax, Numba, Docker