

# Colan Biemer

## Education

Northeastern University, PhD, Computer Science, 2025

Northeastern University, MS Computer Science, 2021

Drexel University, BS, Computer Science (w/ Math Minor), 2017

## Experience

### PhD Candidate | Northeastern University | 2019 - 12/2025

- Successfully defended [my dissertation](#): “Dynamic Level Progressions via Procedural Level Generation Guided by a Markov Decision Process for Platformers and Roguelikes.”
- Created a [procedural level generation system](#) in Python and TypeScript that dynamically adjusts game difficulty in real-time using Markov Decision Processes.
- Published [eight peer-reviewed papers](#) on procedural generation and dynamic difficulty adjustment at leading game conferences, including a Best Paper nomination at IEEE CoG 2022.
- Built three browser-based games (*Recformer*, *DungeonGrams*, and *Fruit-3*) in TypeScript for online player studies, collecting data from 570 participants. Implemented procedural level generation, player telemetry, and A/B testing infrastructure.
- TA for 14 courses in game development, graphics, and C++; nominated for Outstanding Graduate Teaching Award.

### Applications Programmer | Brain Game Center | 2017 - 2019

- Lead developer of [PolyRules!](#), a [Unity](#) game designed to improve cognitive [task-switching](#). Used in a [published weight loss study](#) where participants showed 0.3 greater BMI reduction than the control group.
- Created a [shared submodule](#) to consolidate tools and core features across all lab games, eliminating code duplication across repositories.
- Built a research data platform with AWS Cognito, Lambda, and S3 enabling researchers to configure studies (A/B conditions, game parameters), manage participants, and collect data.

### Information Technology Research Center Co-op | BMW | 2016

- Reduced [Hive](#) query runtime from one month to ~6 hours by utilizing a fifty-node cluster to page the query and parallelize the required updates.
- Developer and administrator for an [ELK](#) stack and cluster to provide [NHTSA](#) data for analysts.
- Built an eight-node Raspberry Pi cluster to offer interns a low-stakes introduction to cluster computing.

### R&D Innovations Team Development Co-op | IPipeline | 2015

- Built two SMS products with Node.js, MongoDB, and Twilio: “Text-a-Quote,” a chatbot that gathered user data via finite-state machine to return life insurance quotes, and “Pipe-SMS,” a rate-limited internal API for transactional messaging.

## Sample Side-Projects

- Developed a [dual-sided Tetris game](#) for the Cira Centre skyscraper using a custom game engine, with SSH and named pipes for server communication. Earned the Guinness World Record for World’s Largest Architectural Video Game.
- Made [adjust.h](#), a single-header C99 library for live parameter adjustment without recompilation—200+ GitHub stars and an [~18k-view tutorial on YouTube](#).
- Created [graph reduction algorithm](#) that accelerated pathfinding on procedural mazes by eliminating 31% of nodes and 65% of edges.
- Implemented high-performance [Connect-4 solver in Rust](#) using bitboards.

## Skills

**Main Languages:** C, Python, TypeScript

**Other Languages:** C#, C++, Go, Java, Rust

**Game Dev:** Raylib, SDL3, Unity, OpenGL

**Infrastructure/Tools:** AWS, GCP, SQLite, Git, Bash, Docker