

# 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

- Developed a method that assembles video game levels with a Markov Decision Process for dynamic difficulty adjustment, and all the work is [open-sourced](#) for others to build on.
- [Published eight peer-reviewed papers](#) on topics including dynamic difficulty adjustment, Markov decision processes, procedural level generation, level linking, and player reflection in leading game conferences.
  - “[On Linking Level Segments](#)” was nominated for best paper at the IEEE CoG 2022 conference.
- Programmed games from scratch for online player studies ([Recformer](#), [DungeonGrams](#), and [Fruit-3](#)).
- Teaching Assistant for undergrad (C++) and graduate courses (Game Engines and Computer Graphics).
  - Nominated for “Outstanding Graduate Teaching Award.”

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

- Lead developer of [PolyRules!](#), an iOS game built to improve players’ [task-switching](#) capabilities.
  - [A weight loss study](#) included a condition where players played PolyRules! as part of the program. Their BMI decreased by an average of 0.3 more than in the other condition of the study. Additionally, they reported an “improved attention to details, concentration, focus, and memory” from playing PolyRules!
- Created a [submodule](#) used by all Unity games, addressing a previous problem of code synchronization across multiple repositories. This submodule contains essential tools, scripts, and core game features.
- Built a data management tool using AWS Cognito and S3, incorporating user authentication, permission controls, and game configurations utilized by researchers to collect data and manage their studies.

### 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

- Developed “Text-a-Quote,” a texting chatbot with [Twilio](#) that queried users for information and sent back a life insurance quote. Made “Pipe-SMS,” which provided an API for sending texts (e.g. confirmation codes).

## Sample Side-Projects

- Made [adjust.h](#), a single-header C99 library for live parameter adjustment without recompilation—200+ GitHub stars.
- Built open-source C99 implementations of classic games ([Wordle](#), [Tic-Tac-Toe](#), [Snake](#), [Pong](#)) with a [unified GUI launcher](#).
- Implemented high-performance [Connect-4 solver in Rust](#) using bitboards.
- Created [graph reduction algorithm](#) that accelerated pathfinding on procedural mazes by eliminating 31% of nodes and 65% of edges.
- Programmed [dual-sided Tetris installation](#) for the Cira Centre skyscraper, earning the Guinness World Record for [World’s Largest Architectural Video Game](#).

## Skills

**Languages:** C, C++, C#, Go, Python, JS/Typescript, and more

**Tools:** Git, Unity, SQLite, OpenGL, Raylib, SDL3, Terminal, Vim, AWS, GCP, and more.