Andrew Cupps

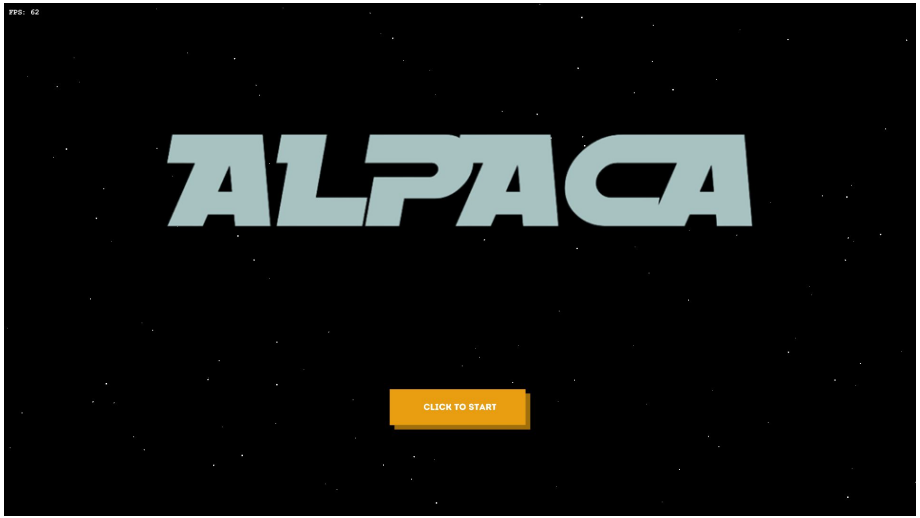
CS Portfolio, September 2022

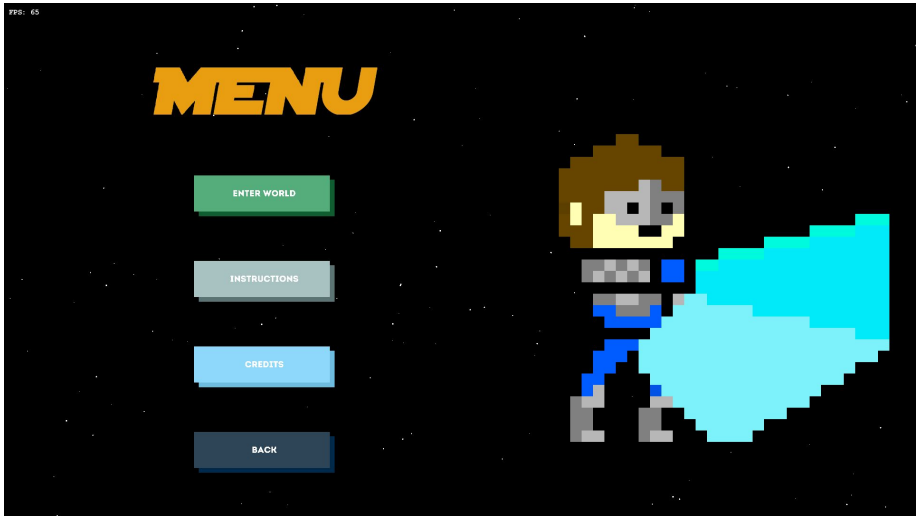
“ALPACA”

Platformer Video Game, Sept-Dec 2021

Project Overview: “ALPACA”

ALPACA is a game I created in Java using the Slick2D graphics library with three other students from September to December of 2021. The game is a third-person platformer in which the player surmounts obstacles, attacks multiple types of enemies with different behaviors, and collects tokens to unlock new gameplay features or stats.



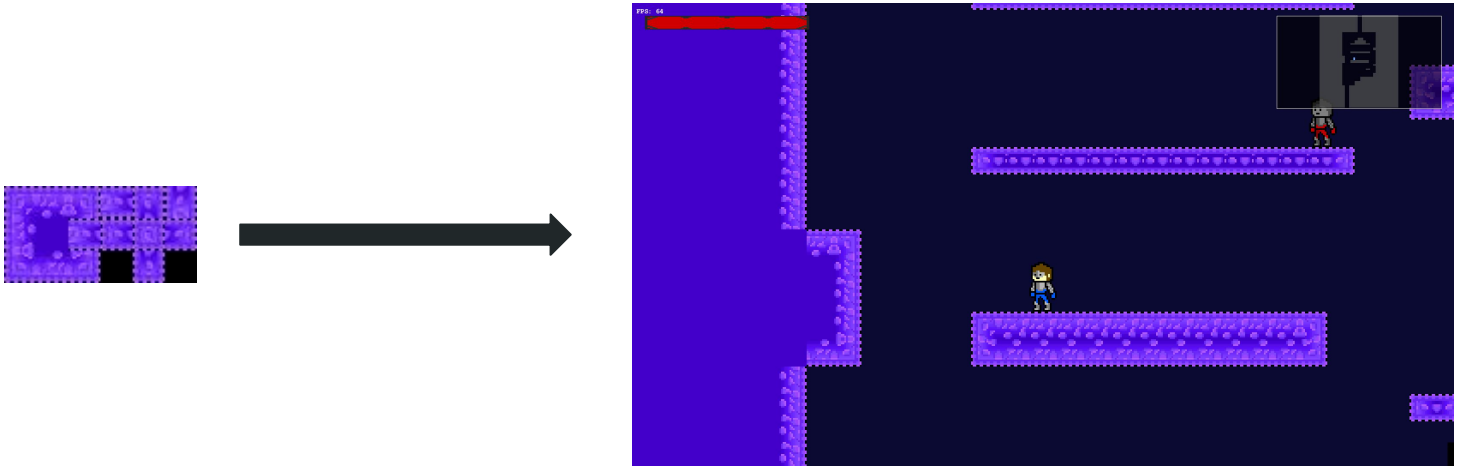


My Role: Backend Developer

As the backend developer for this project, I:

- Created the basic game engine and physics utilized throughout the development process
- Built a system focused on project scalability, allowing for new levels to be created easily by reusing the same commands in level design
- Developed a tiling algorithm which allowed front end developers to render entire levels automatically from a single tileset image *(example of this provided on the following slide for clarity)*.

Overall, I created most of the behind-the-scenes structure for this program which were fundamental to gameplay, level-design, and front-end implementation of graphics.



The algorithm I wrote allowed for the front-end developers of this project to create the tileset image on the top-left and use it to automatically render the texture for any platform or wall on-screen with only a single line. In this example, only one tileset texture is used, but multiple textures can be rendered within any given level.

Using this algorithm, the computer only needs to perform a single calculation at the beginning of each level to accurately determine the placements of each texture for the remainder of the player's stay within that level.

“Schreckliche Seuche”

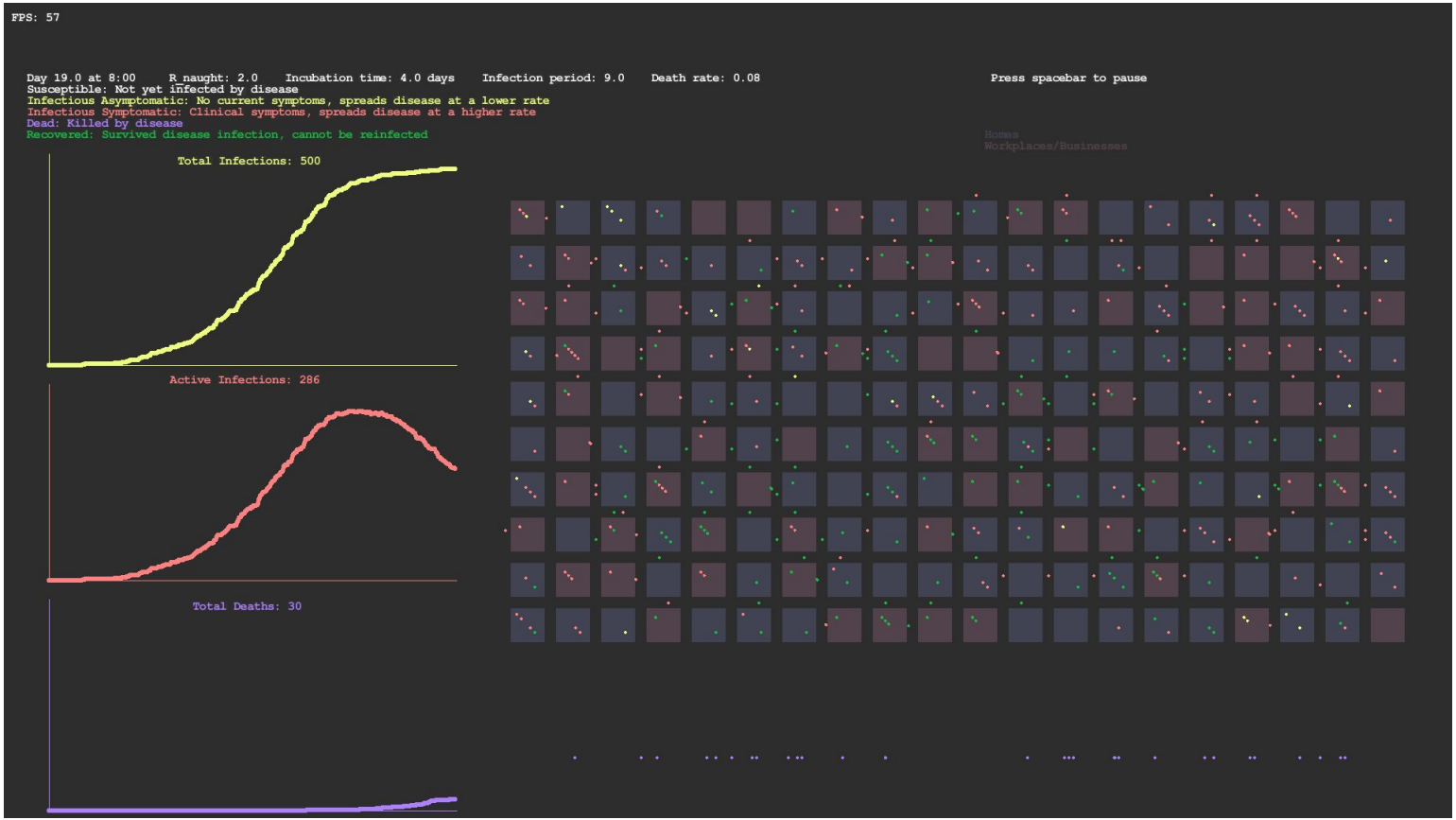
Disease Spread Simulator, Mar-May 2022

Project Overview: “Schreckliche Seuche”

Schreckliche Seuche is a simulation I created with two other students which shows the spread of a disease through a community based on various factors, including population size, population density, pathogen infectivity, and incubation period length among other customizable factors. This is *not* meant to be a game like “Plague, Inc.”; it is a simulation to model how various factors affect how a disease spreads through a population.

My Role: Full Stack Developer

For Schreckliche Seuche, I created everything on this screen of the project:



My Role (Continued)

This included:

- Designing and creating an object-oriented simulation for the spread of disease
- Allowing for dynamic changes based on user inputs on other screens of the program in collaboration with other developers
- Implementing a basic pathfinding algorithm to represent people moving throughout their community
- Visually representing the entire simulated population of varying size and density
- Graphically representing data from the simulation with three continuously-updating charts

R Projects

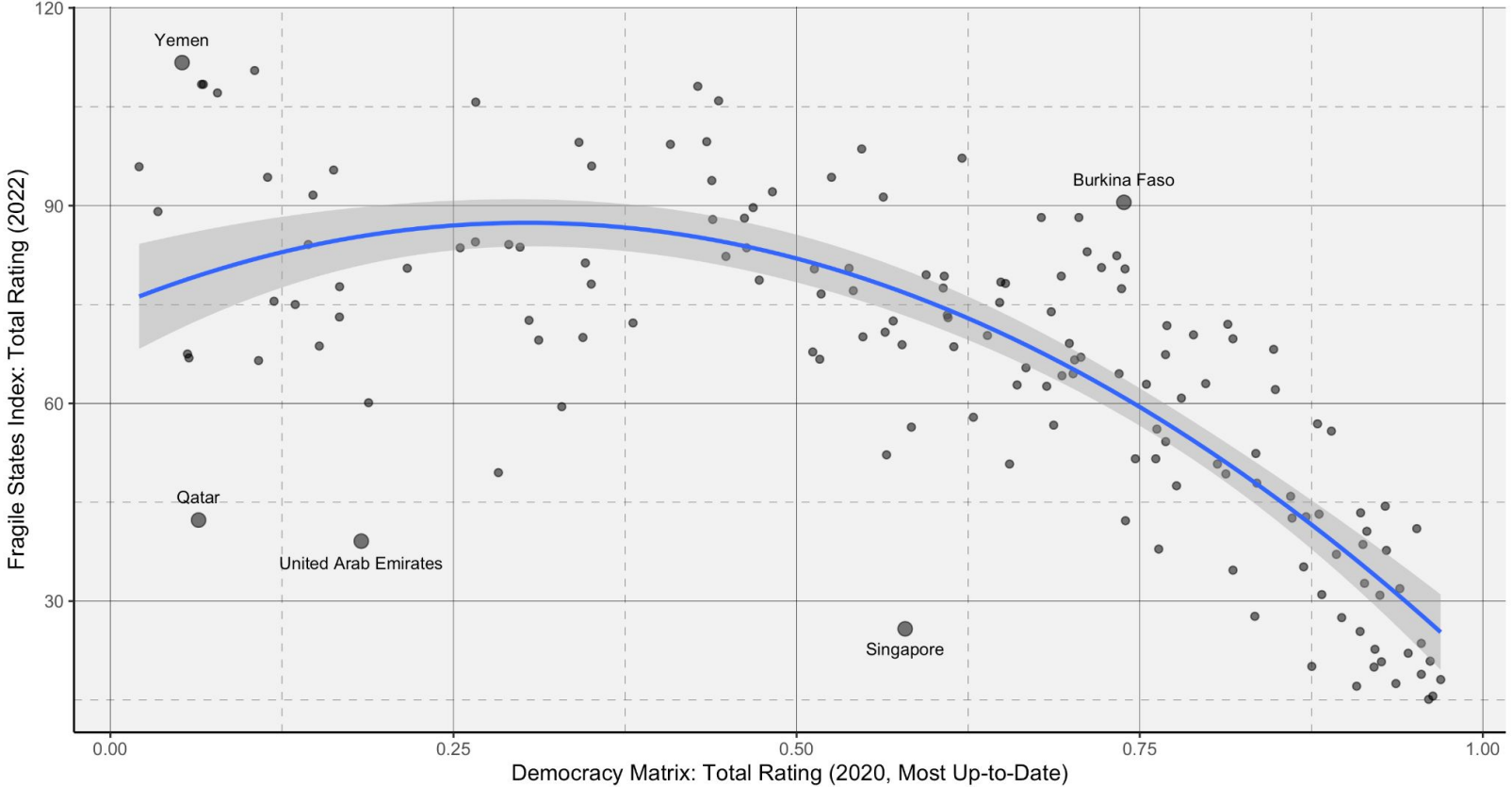
Various projects in R, Aug 2022 - Present

My R Projects

As part of a course at the University of Maryland, I am using the R programming language in RStudio to rearrange, analyze, and visually represent data from CSV files to demonstrate trends and important information on the world around us.

State Stability Compared to Overall Domestic Freedom

Fragile States Index rating plotted by Democracy Matrix Rating for 176 countries



By Andrew Cupps
Sources:
Democracy Matrix (democracymatrix.com)
Fragile States Index (fragilestatesindex.org)

Rising Average Incomes Across Non-Western Regions

Income per Capita by Year, 1993 - 2020

By Andrew Cupps

Source: WorldBank (NY.ADJ.NNTY.PC.CD)

Relevant Coursework

- CMSC132 - Object Oriented Programming II
  - Data structures and algorithms in Java
  - Design principles and execution for software
- CMSC131 - Object Oriented Programming I
  - Credit granted from a score of 5 on AP Computer Science A exam
  - Introduction to programming and design in Java
- MATH246 - Differential Equations
  - Solving and using ordinary differential equations
  - MATLAB
- HGLO101 - Globalization
  - Data analysis using R

Feel free to contact me!

- Send me an email: at.cupps@gmail.com
- Check out my Github for these projects at github.com/atcupps/portfolio
- Visit my LinkedIn at this link