

Projects

3D Music Visualization with SoundCloud API

A primarily **JavaScript** web application served on **Flask** that randomly generates a 3D world with trees, fireflies, clouds, and a waterfall. A custom music player built for the **SoundCloud API** lets you choose your favorite track and watch as the fireflies move and change shape/color in response to your music.

- Uses **asynchronous** requests to the **SoundCloud API** to load buffered audio data from the resulting response into a custom music player featuring a **neumorphic design**.
- Utilizes **Howler.js** library and the **WebAudio API** to create an **audio context graph** and an audio analysis node to generate an array of integers that correspond to frequency data from your song playing in real time.
- Said frequency data is then fed into a **Three.js** scene which uses 3D terrain meshes created from geometric primitives that are placed randomly throughout the allowed 3D space.
- The frequency data informs a set of randomly shaped and placed fireflies whose **RGB** values, **vertical/y-axis displacement**, and **horizontal (x/z-axis) movement** are associated with said frequency data.

Weather Web Application

Flask web-application displays weather information for any city/location in the world with a google-maps style weather map and hourly temperature graph.

- **API** calls to Weatherbit.io and Openweathermap.org.
- **JSON** weather data returned is stored in an **array of hashmaps**, where each hashmap element in the array represents weather data for a single day of the week, such as temperature, humidity, etc. for that day.
- **HTML** results page converted to Jinja template using **Bootstrap4** for styling, to which data was passed via **Flask**.
- **jQuery** used for **DOM** manipulation to dynamically calculate and update **HTML** elements on entire page between imperial and metric unit values, using a single toggle switch.
- **Chart.js JavaScript** library used to create hourly weather graph.
- **Leaflet JavaScript** applet embedded in the page whose layers were provided by Openweathermap API and weather data was populated via hashmap array data in **Flask**.

Sushi Cat a Top-Down 2D Maze Traversal Game

The user plays as a cat collecting sushi in a top-down 2D maze created using turtle graphics module in **Python**. An exercise in **Object Oriented Programming**.

- **Multidimensional array** to create the playable map where player, terrain, and **object** coordinates are maintained.
- **3 arrays** of coordinates, representing passable terrain, impassable terrain, and interactable **objects** (such as sushi).
- In each array category, the coordinate object element is divided by the sprite used to represent it, whether to appear visually as a wall, tree, flat ground, lantern, etc.
- Player/cat **object** records quantity of sushi collected and current coordinate location.
- Based on **user input** (i.e. arrow or WASD keys), player/cat **object** calculates which coordinate is requested to be moved to next. Whether or not actual movement by the player occurs is determined by if the coordinate is a member of the array of passable terrain objects.

School District Management Web Application

A **Flask** web-application for use in viewing and managing Schools, Students, Classes, and Instructors for a hypothetical School District, created for Database Design course at OSU with full **CRUD** functionality.

- **HTML/CSS** frontend whose displayed data from pages and input forms are dynamically generated from an **originally designed database** complete with entity relationship diagram (ERD) and database **schema**.
- **SQL queries** transmitted from webapp to the database managed with **MariaDB**. Users of the application can directly alter the database to add or remove schools, teachers, etc. and retrieve such information as well.

Animation Film Webscraper with SMS Notification

- **Python** program utilizing BeautifulSoup4 and Twilio APIs.
- **GET** requests to local film theatres film schedules to specifically filter for animation/anime films in real-time.
- **HTML/CSS/JavaScript** in **JSON** form is converted to unicode with BeautifulSoup4 and parsed to obtain film title, description, screening location, and screening dates for each unique film.
- Using Twilio **REST API**, the information per film is sent as an **SMS** text to a recipient/phone number of your choosing.

Website

<https://john-sy.com>

Github

<https://github.com/DarkHorse108>

Skills

- ☐ Python
 - ☐ C/C++
 - ☐ SQL
 - ☐ JavaScript/jQuery
 - ☐ HTML5/CSS3
 - ☐ IA-32 Assembly
 - ☐ OpenCL/OpenGL
 - ☐ CUDA
 - ☐ OpenMP
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Technologies

- ☐ MariaDB/MySQL
 - ☐ Flask
 - ☐ Node.js
 - ☐ Three.js
 - ☐ Git
 - ☐ Linux (RHEL)
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Education

B.S. Computer Science
Oregon State University
(2018 - 2020)

B.S. Biology
Hawaii Pacific University
(2010 - 2013)
Colorado State University
(2008 - 2010)
