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/alexanderjsullivan



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### PROGRAMMING LANGUAGES

TypeScript/JavaScript HTML & CSS/SCSS/SASS SQL (MySQL & PostgreSQL) NoSQL (MongoDB) **Python PHP** R C# Git & Bash YML



Blender

XML & JSON

## FRAMEWORKS AND TOOLS

Next.js & React Material-UI & Bootstrap CI/CD w/ GitLab & GitHub Actions Amazon Web Services (AWS) Google Cloud Platform (GCP) **Google Firebase Google Analytics & GTM** Sentry Auth0 Unity Algolia Figma Cypress & Jest jQuery D3.js

# Full Stack Developer & Bioinformatician

Versatile full-stack developer and bioinformatician with 7+ years of experience developing web applications and bioinformatic tools.



## WORK EXPERIENCE

### Full Stack Developer | Masterpiece X

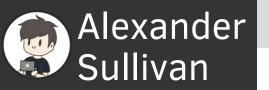
Masterpiece Studio | Dec 2021 - Present

- Developed the Masterpiece X web application which allows users to interact with a growing library of 3D models and assets available for the community to explore, use and remix (edit).
- Implemented a generative AI tool to allow users to use text prompts to generate a 3D model with animations via a web browser.
- Created an interface and APIs to allow users to interact and manage **their assets** while inside the Meta Quest VR app developed with Unity.
- Managed CI/CD deployment pipelines for production updates.
- Maintained the Masterpiece X front end, back end APIs & databases and Firebase Functions for bugs, performance, optimizations and user & QA reported feature requests and issues.
- Managed & monitored analytic metrics to be used to track and understand how a user interacts with the Masterpiece X app.
- Engineered & managed user account systems (from front-end, to API endpoints and database) enabling management of account public and private 3D assets, account details and deletion.
- Built UI features & back end API endpoints (with respective PostgreSQL database changes) and managed third-party services across the Masterpiece X community library, user storage system, generative Al tool, account management pages and admin systems.
- Ensured responsive web application on mobile, desktop, tablet, VR browsers and a custom in-app viewport while ensuring compatibility for users with accessibility requirements.

### Web Developer & Bioinformatician | eFP-Seq Browser & GAIA

BAR/Provart Lab - University of Toronto | Sep 2016 - Dec 2021

- Developed multiple bioinformatic web tools and applications with Professor Nicholas Provart and his BAR (Bio-Analytic Resource) lab.
- eFP-Seg Browser | Data Visualization Programmer
  - Developed the eFP-Seq Browser, a web tool to visualize gene expression data from RNA-Seq experimental data.
  - Developed UI features for visualizing RNA-Seq experimental data.
  - Implemented an account system to store and manage uploaded data.
  - Collaborated with a research lab to ensure the reliability of statistical outputs for the RNA-Seq analysis using both Pearson Correlation Coefficient and point-biserial correction coefficient in R.
  - Published in an open-access paper, The Plant Journal, as a firstauthored peer-reviewed scientific publication with over 26 citations & zero being contrasting statements.







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### PERSONAL PROJECTS

Impact Depth | May 2021 - Jan 2023

- Visualize citation flows of a publication of interest and use an interactive tree to understand what scientific fields that publication impacted.
- Created using D3.js & React, custom data scrapping and processing scripts, database on MongoDB, hosted using Firebase.

Small Dev Talk | Mar 2013 - Apr 2016

 Created a blog website that wrote interview and news articles about projects and games in the indie community.



### **TEACHING**

### **Teaching Assistant**

University of Toronto | Jan 2019 - Aug 2021

 TA for CSB352: Bioinformatic Methods & BIO130: Molecular & Cell Biology

#### **Academic Tutor**

Mai Tutor | Sep 2012 - May 2013

 Tutor students from grade 1 through grade 11

# Full Stack Developer & Bioinformatician



## WORK EXPERIENCE (...CONTINUED)

### Web Developer & Bioinformatician | eFP-Seq Browser & GAIA

BAR/Provart Lab - University of Toronto | Sep 2016 - Dec 2021

- GAIA (General Agricultural Intelligent Agent) | Project Lead
  - Designed and developed GAIA, a web tool to aggregate and synthesize general agricultural biological information across over a dozen species to centralize and simplify data search while enabling users to ask broad questions.
  - Managed a team of programmers and bioinformaticians to ensure GAIA's features were **delivered by the expected deadlines** through iterative & agile development.
  - Developed UI features & back end webservices as well as dataprocessing scripts.
  - Developed a statistical natural language processing (NLP) feature to answer broad questions by creating an in-house machine reading (MR) logic.
  - Collaborated with a machine-learning research lab to create a machine vision tool (using GCP Vision API) to recognize and read biological pathways in figures & image to allow them to be searchable within GAIA.

### **Unity Software Engineer | VirtEx Labs**

Dr. Kilkenny's Lab - University of Toronto | Aug 2017 - Sep 2018

- Researched and developed a virtual reality (VR) pedagogical prototype to teach basic scientific laboratory techniques.
- Was the sole developer on this prototype and was responsible for programming in C# in Unity 3D game engine, creating custom 3D assets using Blender, working with teaching laboratories to replicate basic techniques, as well as handle bug fixes and optimizations.
- Was awarded the NVIDIA Academic GPU Grand Program.



### **EDUCATION**

#### Master of Science (MSc) - Bioinformatics

University of Toronto | Aug 2018 - Nov 2021

### Bachelor of Science (BSc) - Biotechnology

University of Toronto | Sep 2013 - June 2018



#### **PUBLICATIONS**

## ePlant in 2021: New Species, Viewers, Data Sets, and Widgets

Preprint (bioRxiv) | Apr 2021 | doi 10.1101/2021.04.28.441805

An 'eFP-Seq Browser' for visualizing and exploring RNA sequencing data The Plant Journal | Jul 2019 | doi 10.1111/tpj.14468