



Alexander Sullivan





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</> PROGRAMMING LANGUAGES

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

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 AI 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-Seq 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 **first-authored** 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 webservice**s as well as **data-processing** 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