Jacob Lopez

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Education

- **University of California, Berkeley** — Berkeley, CA
  Bachelor of Arts in Computer Science — *Aug. 2015 – May 2019*
- **Relevant Course Work**: Machine Learning, Artificial Intelligence, UI, Graphics, Operating Systems, Compilers, Virtual Reality, Computer Security, Efficient Algorithms, Machine Structures, Internet, UNIX, Data Structures

Experience

- **Socket Mobile, Inc** — Newark, CA
  Software Intern — *Summer 2017 and 2018*
  - **Scanner Model Web API**: Developed a website and REST api that allows developers using Socket's SDK to pull json data from the Azure database into their scanner applications. Created an Azure database and utilized the C# web api using .NET's MVC framework. Implemented an admin page for database maintenance, authenticated and secure login, account creation, and an sql database of users. The company still uses this. It has over 40 corporate users and is still growing.
  - **Scan Engine Updater**: Developed a tool to install and update scan engine firmware over a serial connection. Implemented and utilized the YModem transfer protocol in C#.
  - **Automatic Sharepoint Uploader**: Developed several Powershell and python programs that use Microsoft's Sharepoint web api in order to authenticate and automatically upload new scanner firmware builds.
  - **Data Converter**: Implemented a C# helper application that compresses raw json data from a website, re-formats certain entries, and uses Microsoft's Azure C# library to insert the data into an Azure database.
  - **Firmware Installers**: Developed several Microsoft Installer applications with WiX and xml to install new firmware builds to internal testing machines.
  - **HID Keyboard Table scripts**: Developed a python program to map HID keyboard codes to keys based on different international keyboard layouts.
- **Cal Band Computer Committee** — Berkeley, CA
  Computer Assistant — *August 2018 - Present*
  - **Members Only Website**: Implemented a page to handle rehearsal excuse requests in python. Automatically approves requests if the member still has their "free" pass. Uses the Django web framework. Currently working on javascript projects.

Projects

- **Pantreasy**: Worked in a team of 5 to develop an app for Android that provides an accessible, streamlined platform to connect producers that contribute the bulk of food waste (restaurants and grocery stores) with those in the best position to redistribute food to the needy (food pantries/charities). Contributed to all parts of the design cycle: brain storming, user interviews, task-analysis, low-fidelity high-fidelity prototypes, and the implementation of the working app. Implementation included UI view layouts in xml, several Activities for pairing food distributors with food suppliers, menues, confirmation pages, etc. in java, and integration with a Firebase database.
- **Pathtracer**: Developed a renderer that uses either raytracing or rasterization in C++. Implemented supersampling, bilinear and trilinear sampling, texture mapping, bounding volume hierarchies, direct illumination, global illumination, adaptive sampling, lambertian/glass/mirror materials, microfacet materials, environment light, and depth emulation (camera lens).

Personal Projects

- **Virtual Reality Drum Simulator**: Developed a virtual reality application in a team of 4 for the Oculus Rift in which a user can practice playing on a drumkit in a virtualized environment. Written in C#/Unity. Implemented features such as teleportation to play different percussion instruments, the ability to record and play back beats or melodies, tactile feedback, etc.
- **Efficient Graphics Engine**: Designed an efficient 2D and 3D polygon/text graphics engine in C++ using OpenGL. Created a full linear algebra library. Optimized rasterization to render 10000+ textured sprites at 60 frames per second, implemented text rendering and 3D "sandbox" mode.

Programming Skills

- **Languages**: Python, C, C#, C++, GoLang, Java, javascript, xml, SQL, shell/batch scripting
- **Technologies**: .NET, Microsoft Azure, Django, Unity, Maya, Visual Studio, Linux, Windows, Android, Flex, Bison, VirtualBox/Vagrant, Docker