Patrick Lai

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Education

McGill University — Montreal, QC, Canada
B. Eng: Software Engineering — Expected December 2019
- GPA in Computer Science Courses: 3.93/4.00, Overall GPA: 3.33/4.00
- NSERC Industry Undergraduate Research Award: 2016, 2017
- Notable Courses: Applied Machine Learning, Operating Systems, Databases

Experience

CAE — Montreal, QC, Canada
Software Developer Intern — September - December 2017
- Developed a framework to automate validation of flight simulation software, 3-D models, and environment renders using C#.
- Created multithreaded simulations for navigation, environment and weather servers using Java and Apache JMeter
- Reduced validation time of vehicle models and load testing from 2-3 days to overnight through integration into the automation software.
- Wrote scripts to allow the automation software to remotely connect to different servers without user configuration.
- Designed a GUI using Windows Forms to give users easy access to information about test packages and results

Sensequake — Montreal, QC, Canada
Software Developer — May 2016 - September 2017
- Transformed the main application from a proof of concept to a software to be used by researchers, engineers and university professors
- Prototyped and implemented building health analysis algorithms in C# and MATLAB used to analyse over 300 buildings in Canada
- Improved user experience and accessibility by designing a custom ribbon interface in Visual Studio using WPF
- Built a web application using Node.js and MongoDB to let users submit, view and manage various analysis results
- Collaborated with a Cybersecurity firm to create a license activation and application protection system
- Improved 3D animation of largest building cases from 12 to 60 FPS by improving animation algorithm
- Optimized Stochastic Subspace Identification processes to reduce runtime of average test case from 2.5 min. to 40s

McGill Robotics — Montreal, QC, Canada
Software Division Member — September 2015 - May 2016
- Stimulated competition environment using Gazebo and ROS in Linux
- Wrote AUV simulation plugins in C++ to mimic events and object movement

Skills

Programming:	C#, Java, JavaScript, Python, MATLAB, C, C++, SQL, PHP, Solidity
Software:	GIT, Visual Studio, REST APIs, Linux, MongoDB, Unity Engine, Azure
Frameworks:	Node.JS, React.JS, .NET, WPF, Windows Forms
Knowledge:	Data Structures and Algorithms, Object-Oriented Programming, Machine Learning, NLP

Projects

Machine Learning Match Prediction — November 2017
- Used a neural network to predict how likely two people will be romantically compatible based off of socio-economic factors, age, and hobbies
- Trained a model using data collected from dating websites and a speed-dating study with over 10,000 training examples
- Created a web interface using HTML, CSS, and javascript to allow users to input features and view the likelihood of matches

Open Source Gift Card System — March 2017
- Collaborated with engineers from LightSpeed and other students to build a gift card system for an ecommerce platform with over 10,000 users
- Created a responsive front-end UI using React.JS that allows users to purchase, validate, and add funds to cards
- Implemented an API in node.js and express.js to communicate with the main LightSpeed servers

Autonomous Tower Building Robot – Software Lead — October - December 2017
- Divided tasks amongst members, managed GIT repository, report software team's progress with other division leads
- Designed and implemented detection and avoidance algorithms in Java to help the robot find blocks on a grid
- Produced code to maneuver lifting claw designed by the hardware team to collect blocks

Anime Suggestions — October 2017
- Built a recommendation engine in Java that suggests Anime to users based on a list of ones they currently enjoy
- Used the OpenNLP library to parse synopses from MyAnimeList's API for keywords to formulate suggestions
- Designed a ranking algorithm based on number of related items, similarity factor and internet ratings

What Should I do Today? – 2nd place at Angel Hack — June 2016
- Built a web app in JavaScript that allows users to explore tourist attractions around the world by clicking on a map
- Used Expedia's API to retrieve information and Google Maps API to show interactive panoramas of each destination