# NICHOLAS WU

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## TECHNICAL SKILLS (*bold skills indicate proficient knowledge)

- Languages: **Java, C++, C,** Python, C#, Scala, SQL, HTML, CSS, Javascript, Batch, Shell, Intel x86, Arm V7
- Environments: **Linux, Windows, Android Studio, Visual Studio, Inteliji, Vim, Unity,** GDB, Eclipse, VSCode
- Technologies: **Git, Android, JavaFX, REST, JSON, Yelp API,** Vue.js, Node.js, Microsoft Bot Framework, Firebase
- Databases: **Teradata,** MariaDB, MSSQL, Oracle, Sap Hana
- Hardware: **SystemVerilog, Quartus,** VHDL, Arduino, Raspberry Pi, FPGA

## ACADEMIC & CO-OP STATUS

**University of British Columbia, BASc in Computer Engineering** **September 2014 – May 2019**

- Completed 2/5 work terms; Available for 4 or 8 months beginning September, 2017

## WORK EXPERIENCE

**University of British Columbia | *Undergraduate Researcher* |** *Vancouver, BC* **Present**
***Department of Electrical and Computer Engineering***

- Develop DINAMITE, a software performance analysis tool for C/C++ programs, under the supervision of Dr. Alexandra Fedorova
- Design efficient solutions to instrument Java Bytecode allowing DINAMITE to also analyze Java programs

**Safe Software | *Software Developer Intern* |** *Surrey, BC* **May 2016 – December 2016**

- Upgrade C++ compiler toolchain (VC10 to VC14) for over 800+ projects to enable C++11 features for all developers
- Wrap 3rd party libraries and re-design interfaces to fix DLL boundary issues
- Implement the Teradata format using JDBC, allowing clients to read/write data from/to Teradata Database
- Design scalable solutions for bugs, document bug-fixes and create regression tests to minimize technical debt

## PROJECTS & HACKATHONS

**UBC AMS Game Development Association (C#) | *Game Developer*** **January 2017 – Present**

- Implement C# scripts for Cabin Escape, a 3D first-person puzzle game
- Integrate models, textures, and materials from Blender into Unity's game environment

**Desktop Turret Launcher (C, Android/Java, SystemVerilog)** **January 2017 - April 2017**

- Assemble a toy turret consisting of a LCD screen, Bluetooth dongle, Wi-Fi chip, camera, and servo motors
- Design a simple UI on a VGA screen and mobile device to control the turret, take photos, shoot projectiles
- Implement motion detection and colour blob tracking using OpenCV

**Food Shake (Android/Java)** *@ nwHacks 2017* **March 2017**

- Solve "Where should we eat?" situations by randomly selecting a nearby restaurant on phone shake
- Integrate Yelp v3 API to fetch data and reviews, Google Maps API to show directions
- Implement optional user preferences such as budget, cuisine type and distance

**UBC Snowbots (C, C++, Python) | *Senior Firmware Developer*** **September 2014 – September 2016**

- Build an autonomous robot that navigates through an obstacle course for the annual IGVC Competition
- Develop C++ code to analyze current location and calculate distances/angles towards a given waypoint
- Integrate GPS firmware driver to relay data in real-time for master driver to make decisions
- Guide new members through required challenges (PrimeBuzz, ROS tutorials) and usage of Git

**Don't Burn Your Friends (C#)** *@ HackTheNorth 2016* **September 2016**

- Design and implement gameplay mechanics for a 2D point-and-click adventure game
- Mentor junior teammate by teaching basics of Git and explaining tradeoffs with certain high-level designs

**Internet Connected Baby Monitor (Python, C, Web)** **March 2016**

- Collaborate with a team of 6 to create a prototype baby monitor powered by the Raspberry Pi and Arduino
- Implement live video streaming and sound/motion detection to give users feedback
- Use Node.js and Weave to create a secure web UI for clients to control temperature, humidity and even play lullabies!

**Arduino-Based Autonomous Robot (C, Android/Java)** **January 2016 – February 2016**

- Implement autonomous driving using Turtle:2WD mounted with an ultrasonic sensor to detect objects
- Integrate hall-effect sensors on both wheels to stabilize straight movement with a negative-feedback loop
- Assemble three IR reflective object sensors to enable following a dark line at high-speeds

**Happy Claws (C#)** *@ nwHacks 2016* **February 2016**

- Create a virtual claw machine game and integrate the Myo Armband to control claw movement
- Implement C# gameplay scripts and create Unity assets for game environment

**Morse Code with Arduino (C)** **January 2016**

- Design a device to prompt for a speed and message to output in Morse Code using a 7-segement LED and piezo buzzer

**Restaurant Database (Java)** **December 2015**

- Implement a restaurant database that stores information about certain restaurants, reviews and Yelps' user information in JSON
- Enable a multi-threaded client-server pattern to return data about restaurants given an input query

**Blackjack Game (Java)** **December 2015**

- Design the GUI using JavaFX, implement features such as wagers, double-down, split, and high-score
- Program a dealer AI that simulates a real blackjack game in the casino

**RISC Machine (SystemVerilog)** **October 2015**

- Develop a simple RISC Machine that implements arithmetic and memory instructions to learn about CPU design
- Improve the finite state machine to support branch instructions

**Tic Tac Toe Game (SystemVerilog)** **September 2015**

- Create a Tic Tac Toe game and implement an AI that never loses that allowed me to receive several bonus marks

**Simon Game (C)** **March 2015**

- Implement the Simon Game with speed and difficulty selections using DAQ module library

## VOLUNTEER EXPERIENCE

**University of British Columbia | *Orientation Leader*** **February 2015 – Present**

- Lead several campus tours and guide students through icebreaker activities
- Welcome prospective students into the UBC community, share personal stories, and answer any questions

**Global Game Jam Vancouver | *Food Organizer*** **January 2015**

- Organize and distribute food for over 500 attendees and volunteers at the third largest Global Game Jam worldwide

**UBC Leadership Conference | *Lunchtime Activity Organizer*** **November 2015 – January 2016**

- Provide and distribute lunch for over 1200 delegates at one of Canada's largest student-run conferences
- Organize over 20 rooms over the UBC campus to set-up for lunch time workshops and activities

**GEERing Up! UBC Engineering & Science for Kids | *Junior Instructor*** **June 2014 – September 2014**

- Supervise and act as a positive role-model to motivate campers to finish activities
- Lead and guide a group of 30 kids through activities to ensure they are interested and learning

## INTERESTS

- Robotics, automation, data analysis, spatial data, game development, web development, data mining
- Soccer, basketball, volleyball, ultimate, snowboarding, hiking
- Music, board games, video games, TV, food, travel