# BILAL MAJEED

Computer Engineering | University of Waterloo

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## QUALIFICATIONS

- **Languages:** C, C++, Python, C#, Java, VHDL/Verilog, ARM Assembly, MATLAB
- **Tools/Protocols:** CAN, Buses (UART, SPI, I2C), CANalyzer, IPC (pipes, FIFO, message passing, shared memory), Git
- **Hardware:** Atmega328p, TM4C123G LaunchPad (ARM Cortex-M4), Altera FPGA Max10, Raspberry Pi, Arduino
- **Embedded Knowledge/Skills:** FPGAs, UNIX, Parallel/Serial Interfacing, Memory Management, SW/HW Debugging, Board Bring-Up

## EXPERIENCE

### FLEX AUTOMOTIVE SOLUTIONS

*Software Engineer | Jan 2017*

- Increased testing automation and coding efficiency by 40%, analyzing and integrating various development tools (i.e. version control tools, ALM tools, requirement management infrastructures)
- Lowered risk of failure of actuators on the Ford liftgate modules by developing sensor data visualization using the vehicle's CAN bus and manipulating stress testing logs
- Resolved button debouncing issues on tester boards by implementing software solutions and validating the hardware solutions
- Prototyped Apple CarPlay solutions using the Atmega328p chip with AVR-C to implement USART serial communication capabilities
- Participated in board bring up (Testing PCBs for products insuring full functionality with the code and validating hardware implementations)

### VERIDAY

*Full Stack Developer | May 2016*

- Migrated entire client's old data to a proprietary content management system by creating data scrapping applications using Java and Selenium
- Implemented regular expressions and parsing logic as necessary to provide robust analysis of third party data
- Achieved higher product quality by providing analytics of the data migration solutions through standalone Java web applications

### FLIPP

*Software Developer | Sept 2015*

- Created dynamic online flyers used by 1,000,000+ users through the Rails framework with JavaScript
- Improved internal work flows and performance by implementing Rake tasks and Ruby scripts
- Coordinated projects with clientele gaining extensive experience of shipping and maintaining applications with larger user bases

## PROJECTS

### VHDL Compiler (Java, VHDL)

- Created a VHDL synthesizer and simulator using Java
- Uses a subset of VHDL (combinational circuits) as the input language and produces circuit gate diagrams and simulations as outputs
- Learnt key compiler concepts such as regular languages, regex, DFAs, lexing, recursive descent parsing, and context-free grammars

### DAC Music Player (Altera FPGA Max10, C)

- Implemented a 16-bit sampling stereo digital to analog audio player
- Gained experience of the Altera audio IP core, embedded audio sampling and the methods of audio buffering and playback
- Utilized the FatFS library with a CLI to mount and interpret WAV files from the onboard microSD card

### HANDWRITTEN DIGITS OCR TOOL (Python, Scikit-Learn, OpenCV)

- Used supervised machine learning principles to train a multiclass Linear SVM using the MNIST database of handwritten digits
- Implemented Gaussian blur filtering and HOG feature detection to analyze input images to be used by the ML classifier
- Took advantage of open source python libraries such as OpenCV and scikit-learn to implement the various ML and computer vision algorithms