SeungJae (Jay) Baek

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EDUCATION

- **University of California, Los Angeles (UCLA)**
  - Electrical Engineering Major

RELEVANT COURSEWORK

· Principles of Photonics · Electromagnetic Waves · Digital Signal Processing
· System Design · Principles of Semiconductor Device Design · Logic Design of Digital Systems
· Analog Electronic Circuits · Microwave Circuits · Wireless Communication Links and Antennas

WORKING EXPERIENCE

- **Ozcan Research Group at UCLA** **Oct 2016 – Present**
  HHMI Undergraduate Research Assistant – Sperm Tracking with 2D Imaging Platform
  - Built a new set up for Raspberry Pi Camera sensors with Python and improved capturing speed for sequential images to increase the efficiency of the device
  - Converted Auto-focus functions that previous lab researchers wrote from MATLAB to C++

PROJECTS

- **Activities Recognition for Walking, Jogging, and Squatting** **Fall 2016 – Present**
  - Designed wireless-wearable sensors to identify and measure participant's activities
  - Implemented C and Arduino so that IMUs can send data to a server via Wi-Fi using Linux kernel
  - Developed MATLAB code to analyze data, to visualize, and to identify the participant's activities
- **Wireless Air Mouse at IEEE** **Fall 2016**
  - Implemented Arduino code so that a microcontroller can be used as a computer mouse with SPI, I2C, and UART communication between two MCUs using RF24 and IMU
  - Built circuits for two MCUs with LEDs and switches for battery status and click functions respectively
- **Circuit Design Project** **Winter 2016**
  - Designed a circuit that removes 10kHz from a corrupted signal
  - Developed a Band-reject filter with center frequency of 60Hz to satisfy given conditions
  - Implemented a simulation with SPICE software and MATLAB
- **NATCAR (Automatic Line-Following Racing Car) at IEEE** **Fall 2015**
  - Implemented tests and built codes for motor, servo control, and PID controller with a microcontroller
  - Designed a line detection algorithm for line scan camera and invented a fast-stop mechanism for PID controller
- **Vending Machine Design** **Spring 2015**
  - Built a sequential circuit for FSM consisted of multiple logic gates and two JK flip-flops rom high-level specification
  - Implemented Verilog so that a simulation for correctness of codes can be done
- **Autonomous Arduino RC Car** **Fall 2014**
  - Implemented Arduino code so that a RC car can autonomously drive itself using ultrasonic sensors
  - Developed one ultrasonic sensor as a radar system with a servo so that it can rotate 180 degrees to monitor any obstacles and send the date (angle and distance) to a computer via serial port
  - Built a circuit to control a DC motor's direction and to monitor a battery's status

RELEVANT SKILLS

- Familiarity with C, C#, C++, Python, Arduino IDE, Verilog, MATLAB, and SPICE tools
- Ability to utilize function generators, oscilloscopes, multimeters, and soldering
- Skilled at technical writing and using Microsoft Word, Excel, and PowerPoint
- Languages: Korean (Native), English (Fluent), and Japanese (Beginner)