**Kim, Darwon**

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**EDUCATION**

**UNIVERSITY OF ILLINOIS AT URBANA CHAMPAIGN May 2025**

BS, Electrical Engineering(Senior, GPA 3.65)

Relevant Coursework/Knowledge: Analog IC Design, Electronic Circuits, Semiconductor Devices, Power Circuits and Electromechanics, Digital Systems Laboratory, Fields and Waves, Analog Signal Processing, Digital Signal Processing, Biomedical Imaging, Intro to Robotics

**ONGOING PROJECTS**

* Conducting optically detected magnetic resonance (ODMR) experiments to characterize spin properties of nitrogen-vacancy (NV) centers and a newly identified color center in nanodiamonds
* Performing T1 spin relaxation experiments to investigate the spin properties of NV centers and the unknown color center
* Developing and authoring a senior thesis titled “Investigating Spin Properties of NV centers and a Novel Color Center for Quantum Applications”
* In preparation of publishing paper detailing the characterization results of the unknown color center

**RESEARCH EXPERIENCE**

**UIUC Quantum and Nanoscale Photonics Lab 05. 2024 – Ongoing**

* Helped implement LabVIEW code for spin relaxometry experiments compatible with new lab equipment
* Implemented ODMR code in LabVIEW and integrated ODMR setup into the current lab’s optical table setup
* Collected and processed T1, stability, second-order correlation function (g2), and spectrograph data on NV centers and the unknown color center
* Streamlined data processing by developing Python scripts to extract and organize relevant data for analysis
* Characterized and identified temporal delay in the lab’s signal generator to be 110ns
* Characterized behavior of RF generator for ODMR experiments

**RESEARCH SKILLS**

**Experimental Skills (Hands-on)**

* Spin relaxometry (T1) measurements
* Optically detected magnetic resonance (ODMR)
* Fluorescence microscopy and spectroscopy
* CW laser alignment and modulation
* Single-photon detection using HydraHarp
* Use of air and oil objectives for optical instruments and microscopes
* Optimizing experimental parameters utilizing equipment datasheets and technical specifications

**Technical Skills**

* Design and implementation of experimental setups
* Integration of new experimental setups into existing lab setups
* Data acquisition and analysis using LabVIEW and OriginLab
* Instrument calibration and troubleshooting
* Spectrum analysis using Oceanview software

**Analytical Skills**

* Interpretation of relaxation time from T1 measurements
* Literature review and critical evaluation of scientific papers and research

**Writing and Communication Skills**

* Technical writing for literature search, research papers and thesis
* Providing constructive feedback on colleagues’ presentations to enhance clarity and structure of presentation
* Collaboration with colleagues to troubleshoot and resolve technical issues across various aspects of research project

**Project Management Skills**

* Designing and executing experiments with clear timelines by setting internal deadlines
* Keeping detailed lab documentation and progress logbook
* Writing detailed and concise standard operating procedures for new experimental setups
* Ensuring compliance with lab safety protocols

**ADDITIONAL EXPERIENCE**

**UIUC Analog Circuit Design 03. 2024 – 04.2024**

* Engineered a low dropout voltage regulator to maintain a consistent output voltage (1~1.4V) and current (0.1~10mA)
* Simulated and tested in Cadence Virtuoso, achieving specifications for DC load regulation (< 50µV/mA) and DC line regulation (< 500µV/V)

**UIUC Digital Systems Lab 09. 2023 – 12. 2023**

* Implemented bit-serial logic processor purely through hardware
* Developed and implemented top-down arcade game inspired by [*Roadeo*](https://www.engadget.com/2011-11-02-roadeo-a-game-about-a-road-versus-a-car.html) using System Verilog and C with partner

**UIUC Electronic Circuits Lab 09. 2023 – 12. 2023**

* Engineered and soldered an AC-DC power supply that converts 115~125Vrms to a DC voltage of 4.7V with output current of 0~20mA
* Utilized LTSpice to simulate circuit designs and analyzed results using MATLAB for data visualization and performance optimization

**UIUC CODABLE, Python Project Team 09. 2022 – 12. 2022**

* Developed a web scraping program to alert users of new car deals matching user-specified criteria
* Wrote function that scrapes data using user-specified parameters and writes the data into separate csv files

**DEEPSOUND, Quality Assurance Intern (Gunpo-Si, South Korea) 03. 2022 – 07. 2022**

* Assisted in calibrating and testing prototype PAUT device and created over 20 device operation tutorial videos
* Translated over 15 technical documents on testing/validation data for PAUT devices from Korean English
* Created and managed the company website using Wix, overseeing design, content development, and user experience

**Republic of Korea Army (ROKA) (Cheorwon, Gangwon-do, South Korea) 09. 2020 – 03. 2022**

* Oversaw the operation and maintenance of 31 armored vehicles, ensuring optimal functionality and readiness at all times
* Directed transport logistics for 22 drivers and 31 vehicles, strategically planning troop and supply movement routes throughout training and non-training periods to uphold operational efficiency and mission readiness

**UIUC Intro to Electronics 11. 2019 – 12. 2019**

* Designed and created parking sensor on breadboard using basic circuit components (without Arduino or Raspberry Pi)

**ADDITIONAL SKILLS**

* **Hardware:** DC/AC circuit analysis, hardware prototyping, soldering, breadboarding, hardware debugging, FPGA programming, utilization of equipment including oscilloscopes and signal generators and more
* **Software**: Python3, C/C++, LTSpice, Arduino, Xilinx Vivado System Verilog, ROS Noetic, Fritzing, Cadence Virtuoso, LabVIEW, experience with RISC-like microprocessor architecture, HydraHarp, Oceanview, Thorlabs Kinesis, Coherent Laser Control
* **Language**: Fluent in English, Korean

**LEADERSHIP AND EXTRACURRICULARS**

**Worship Team Leader at the Korean Church of Champaign Urbana (KCCU) 09. 2024 – Ongoing**

* Managing an 11-person worship team of musicians, vocalists, and sound engineers, developing group dynamics skills
* Coordination of rehearsal schedules, managing transportation logistics for team members to ensure timely execution of rehearsals

**Worship Team Drummer at KCCU 09. 2022 – 05.2024**

**Administrative Manager at KCCU 09. 2022 – 09.2023**

* Assisted new students settle into campus life by helping with tasks such as setting up bank accounts, shopping for essentials, and providing general tips and guidance

**STEM Club Leader at Graded American School of Sao Paulo (High School)**

* Led a team of students in designing and building their first combat robots using Lego Mindstorms
* Designed and 3D printed a custom quadcopter chassis from scratch