ZHONGSHU SUN

图标

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**Education**

**University of Dayton 3.84/4**   **Aug 2022 - May 2024**

Master of Science in Electrical Engineering

**Coursework:** Power Electronics, Computer Design, Fund Solid-State Batteries, Digital Signal Processor, Analog Integrated Circuit Design, Embedded systems, Artificial Neural Networks

**Shanghai Normal University 3.32/4 Aug 2019 – May 2022**

Bachelor of Electronic Information Engineering (Joint degree with University of Dayton)

**Technical Skills**

**Languages:** C/C++, Python, Verilog HDL

**Technologies:** Altium Designer, PLECS, CCS, PSIM, Keil, AURIX Development Studio, Silvaco, Visio, MATLAB, AutoCAD, SolidWorks, MS office.

**Professional Research Experience**

**Graduate researcher at University of Dayton SPEED Lab** **Oct 2022 - Present**

*Smart Power Electronics, Electric-aviation, and Drive*  *Dayton, OH*

**Publication:** Haoran, M., Maohang, Q., Zhongshu, S., Xiaoyan, L., “A 9x Matrix Autotransformer Switched-Capacitor DC-DC Converter for Data Center Application”, 2023 IEEE Energy Conversion Congress and Exposition.

**48V to 3.2V** **Switch Capacitor Converter for Data Center Application** | *UD S.U.R.E Program*  **May 2023 - Aug 2023**

* **Analog circuit design:** Based on 8X topology, designed a 15X(48V-3.2V) converter that has much a higher efficiency (98.75%, 150W) than traditional Switch Tank Converter for Google’s data center application.
* **Simulation:** Simulated in PLECS to find the required resonant capacitance and resonant switching frequency.
* **DSP:** Used DSP28379 to provide PWM signals for MOSFETs on Code Composer Studio.
* **PCB layout and schematic:** Designed, developed schematic and built using Altium Designer.

**A 6V-1V Series-Capacitor (SC) DC-DC buck converter design**  **Oct 2022 - Dec 2022**

* **Circuit Design:** Designed a 95.7% max efficiency (the highest efficiency a buck can achieve on current market), 500W, 8-phases interleaved 6V-1V SC DC-DC buck converter works as a sub-stage of 48V-6V.
* **Math and data analysis:** Calculated and draw the graph of Total Semiconductor Loss Index (TSLI) vs silicon dye area of the selected MOSFETs by MATLAB and EXCEL. Found the dye area that delivers the highest efficiency.

**Switch Capacitor with** **partial power (60V- 3V) Switch Capacitor Converter design**  **Sep 2023 - Present**

* **Circuit Design:** Based on 15X topology, designed a switch capacitor with partial power (60V-3V) converter that can adjust output voltage.

**Projects**

**Tracking Car design for Automated delivery system** | *2021 TI cup Electronic Design Competition*

* Designed a system based on Infineon TC264 to realize automatic line following, obstacle avoidance function.
* Used Altium Designer to design power supply and motor driver PCB board.
* Single chip coding: Generated PWM signals from single chip and control the turning degree by adjust the duty cycle. Designed line finding program with C language.
* I2C and Uart Communication: Implemented driver for an I2C and Uart communicate with sensors.

**Cocoa Bean Mold/Crack Detection**

* Capture images and label to make datasets for deep learning.
* Used TensorFlow platform to compile python program, train neural network model base on YOLO V5 and deploy.

**Awards**

* Scholarship of Shanghai Normal University in the 2019—2022 semester
* First prize at the 2021 TI Cup Electronic Design Competition
* 1st place at the 2021 Smart Car Competition of Shanghai Normal University
* 1st place at the 2022 Electronic Design Competition of Shanghai Normal University
* 2023 University of Dayton Summer Undergraduate Research Experience fellowship $5000