SHANG Zhenyu Eric
Mobile: +8613099582041 | Email: skylakeshang@gmail.com | Website: https://skylakc.github.io

WORK EXPERIENCE

The Hong Kong Polytechnic University — **Hong Kong**
Research Assistant of Department of EEE — Mar 2026 – Present
- Research on **transcranial magnetic stimulation** and **dynamic wireless charging**.
- Design, modeling, and experimental validation of related prototypes.

PhotonJoy Technology Co., Ltd. — **Hong Kong/Shen Zhen**
Director/CTO — May 2024 – Feb 2026
- Led a **14-member** team and managed supply chain.
- Delivered **6 products**, supporting **CNY 5M** annual revenue.

The Hong Kong Polytechnic University — **Hong Kong**
Project Assistant of Industrial Centre — Jun 2024 – Sep 2024
- **CNN**-based video monitoring system for elderly care scenarios.
- **LLM**-based dialog system for elderly caregiving

The Hong Kong Polytechnic University — **Hong Kong**
Research Assistant of Department of EEE — Oct 2023 – Jun 2024
- Managed hardware and software development for **EVTOL** projects.
- Made **PMSM** driven applications on **FPGA** based hardware.

HONORS & AWARDS

Outstanding Undergraduate Thesis — Jun. 2022
2021 TI Cup **National** Undergraduate Electronic Design Contest **Second Prize** — Dec. 2021
2021 TI Cup Yunnan Undergraduate Electronic Design Contest **First Prize** — Nov. 2021
12th "LanQiao" Cup EDA team competition **first** in Yunnan Province — Aug. 2021
Heilongjiang **Province'** 'Internet+' Innovation and Entrepreneurship Competition **Golden Prize** — Aug. 2021
"HACH" **National** Environmental-friendly Science &Technology Competition **Third Prize** — Aug. 2020

RESEARCH EXPERIENCE

Multilevel Inverter based Wireless Power Transfer — Oct 2024 – Apr 2025
- Proposed a **self-balancing** hybrid-clamp inverter topology with passive capacitor **voltage equilibrium**.
- Solved the limit-cycle phenomenon in ΔΣ-based PMM using **LFSR dithering**
- Built MATLAB/Simulink system model; verified **1 kW** with **ZVS** and **synchronized rectification.**

Voltage Spike Suppression for Matrix Converter — Jun 2025 – Oct 2025
- **Synchronous-clock** control model for coordination between **PSFB** and modified **SVPWM** schemes.
- Bidirectional commutation strategy with "All-ON" freewheeling state ensuring continuous current path.
- Atomized system for easy migrating to **FPGA** microcontroller

PSOC Controller for High Power Resonant Inverter — Mar 2021 – May 2021
- Implemented FPGA-like **PSOC system** for fully **digital control** of a 15-kW inverter and 3 kA LC loop.
- Designed **fiber-optic galvanic isolation** and optical IGBT driver for high-speed operation.
- Developed a TCP/Node.js-based **GUI for real-time** debugging and parameter tuning.

VSLAM technology for multi-rotor UAVs — July 2021 – Nov 2021
- Designed an indoor navigation and avoidance system based on **VSLAM + ROS path planning**.
- Replaced **PID** with **MPC** controller via **system dynamics modelling**, and improved attitude stability.
- Coordinated hardware/software integration and leading a 3-member development team.

Milliwatt Level Low Power Harvesting System for Primary Cell — Nov 2021 – Feb 2022
- Designed an energy-harvesting circuit using **zinc–copper potato primary cells.**
- Hybrid MPPT circuit combining **charge pump** and **boost** topologies for ultra-low energy acquisition.
- Demonstrated stable continuous operation under minimal input power, validated prototype for IoT-scale low-power design scenarios. **3 mW average** and **5 mW maximum** transfer efficiency with **BLE**.

MISCELLANEOUS

- **Hardware Tools:** Altium Designer, Cadence, PSpice, Multisim, SolidWorks
- **Programming**: MATLAB, C/C++, Python, Verilog/System Verilog, Embedded ARM, Linux, FPGA
- **AI Tools**: PyTorch, CUDA

EDUCATION

The Hong Kong Polytechnic University — Hong Kong
Ph.D. in Electrical and Electronic Engineering — May 2026 – Present
M.Sc. in Electric Vehicle — Jun 2024 – Jan 2026