# Jinming Ren

UESTC, China
UofG, Scotland, UK

+86 17882004164
marcobisky@outlook.com
github.com/marcobisky


## ENGAGED PROJECTS

**Movable Antenna (MA) for Anti-jamming** *(Just start)*

- ***Main tools***: `matlab`.
- A heuristic investigation into Anti-jamming through stochastic antenna movement, conducted under the supervision of Prof. Weidong Mei.

**Computer Vision (CV) for Quadrotor Aircraft** *(Just start)*

- ***Main tools***: `matlab`, `C/C++`, `python`, `verilog`.
- A group project (6 people) for programming an automatic quadrotor aircraft for objection detection, robotic arm manipulation, and closed-loop flight control.

**RV32I CPU Core for Education** *(Jan 2025 — Present)*

- ***Main tools***: `verilog`, `VHDL`, `Digital`, Kicad, iCESuger FPGA.
- Simulate an entire RISC-V 32 bit CPU in verilog and `Digital` Software.
- Support basic peripherals such as GPIOs, IIC, UART, VGA, etc.
- Simple boot ROM in assembly, minimal interrupt service for running a Linux kernel.
- Complete PCB design in Kicad (Not finished).

**AME Source Coding** (*Oct 2024 — Nov 2024*)

- ***Main tools***: `python`, `matlab`.
- Final project of **Information Theory** Course.
- Developed a method (Second-order Markov Adapative Approximation, AME) to perform source coding for *the Game of Thrones*. The performance of Huffman and Fano coding was also evaluated.

**CNN for Mbed** (*Feb 2024 — May 2024*)

- ***Main tools***: `python`, `C++`.
- Integrated a Convolutional Neural Network (CNN) into an MCU for smart fall detection for the elderly.
- Realized functions include smart fall detection, body temperature monitoring and real-time data visualization.

**A Study of Generalized Fields and Extension to Higher Dimensions**[1] (*Oct 2023 — Feb 2024*)

- A theoretical study of generalized natural fields and behaviours in higher dimensions.
- Largely motivated by my tutor Mr. Yidong Liu and my friends and complete by myself.

**Human Voice Recognition Smart Car** (*Sept 2023 — Dec 2023*)

- ***Main tools***: `C++`, STM32F103C8T6 MCU, etc.
- Led a team of a group of 4 people.
- Built a car with recognition of pre-defined English words to control the movements of a small car. Basic operations include moving forwards and backwards, turning or sliding left and right, etc.

**Auto Door Opener for Dormitory** (*Sept 2023 — Oct 2023*)

- ***Main tools***: `C++`, Nucleo L432KC MCU, Mbed library, OLED screen, etc.
- This was the final project of the Microelectronic System course.
- Realized opening our dormitory door by simply entering password from a keyboard outside the room (instead of using physical keys). Basic functions include setting up password manually, automatically lock if wrong password is entered over 5 times, display messages on an OLED screen, etc.

**"XinTong Cup" Electronic Design Competition: Electronic Keyboard Music Player** (*Sept 2022 — Oct 2022*)

- ***Main tools***: `Keil C51`, STC89C52RC MCU, etc.
- Led a small team of a group of 3 people.
- Successfully built a simplified keyboard music player with 8 keys using an 8-bit MCU by ST company and Keil C51 language for register-based development.
- Functionality of the keyboard music player consists: Single note playing, chord playing, recording ability, replay and rewind capability, etc.

## ACADEMIC RECORD[2]

Table 1: Detailed scores of core courses (**GPA: 3.88** out of 4.00)

| Year | Subject[3] | Score (Full mark: 100) |
|---|---|---|
| Year 1 | **Calculus I/II** | **91/92** |
| | **Linear Algebra** | **84** |
| | **C Programming** | **95** |
| | **Physics I** | **88** |
| Year 2 | **Physics II** | **96** |
| | **Signal and Systems** | **91** |
| | **Probability and Statistics** | **92** |
| | Microelectronic Systems | 92 |
| | **Embedded Processors** | **95** |
| | **Circuit Analysis and Design** | **95** |
| | Computer Network | 94 |
| | **Academic English** | **89** |
| Year 3 | Information Theory | 91 |
| | Principles of Communication | 95 |
| | **Digital Circuit Design** | **86** |
| | Machine Learning | 86 |
| | **Stochastic Signal Analysis** | **82** |

## RELEVANT SKILLS

- **IT Skills**: Latex, (Quarto) Markdown, Typst, Manim[4], Github[5], Microsoft Office.
- **Computer Programming**: `C/C++`, `Matlab`, `Python`.
- **Embedded System Programming**: `RISCV assembly`, STM89C5x (Standard lib), Keil C51.

- **Math**: Self learned (Abstract Algebra (Harvard E-222)), Point-set Topology, Measure Theory, Complex Analysis (MIT 18.04), Functional Analysis, Elementary Differential Geometry, Smooth Manifolds (*still learning*). I didn't go too deep in each of these subjects, but I understand their motivation and basic ideas behind them so that I will use fewer time learning these.
- **Team Work**: Zoom meeting, Notion team, Microsoft team.
- **Language**: No problem in understanding English lectures, native Chinese.

## OTHERS

- **Classical Music Enthusiast** : Violin player in UESTC symphony orchestra, votary of legendary composer Gustav Mahler and Johann Sebastian Bach.
- **Badminton Lover** : Sports always refreshes me at any time.
- **Learn Everything** : I'm open to think and learn *everything* exist or non-exist on earth.
- **Volunteer Work** : Love helping others, over 15 hours of volunteering.