# WindBorne Firmware Wizard Application

1. Show us a cool thing you've built/coded up :) I know you're already submitted a portfolio, but this one should be something that you're proud of and want to explain why. For reference a single image and a three sentence description explaining why it's cool / unusual is perfect.

   4-Wheeled Holonomic Drive Robot (STM32)
   I built a **holonomic drive robot using an STM32**, with each wheel independently driven for full omnidirectional movement. The firmware handled real-time kinematics and smooth motor control, resulting in a platform that could strafe, rotate, and glide like it was on ice. I also developed a **STM32 + ESP32 cloud-integrated sensor system**, which collects data from multiple sensors, streams it to the cloud via Wi-Fi, and allows real-time monitoring, combining embedded control with scalable cloud connectivity.
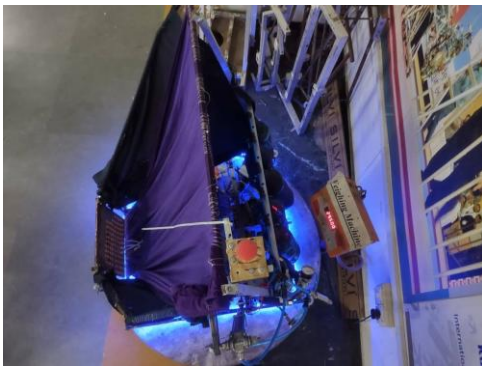
2. What's your favourite niche peripheral / feature of a microcontroller?

   My favorite niche peripherals are **SPI, UART, and I^{2}C**, as they provide flexible communication options for sensors and other devices. I like how they allow reliable data transfer while keeping firmware efficient and modular.

3. Have you ever hacked together a firmware "fix" you knew was kinda sketchy but it kept the project alive? What was it?

   In project involving a four-legged robot, while theoretically the actuations should have occurred at the same time, due to mechanical differences in the actuators a

imbalance was created. I added a manual delay in the actuation time to avoid changing the hardware while letting the robot operate smoothly.

4. You get a PCB that resets randomly once every few hours. What's your go-to first couple of tests?

   a) If a PCB resets randomly then the first thing to be checked is the wiring and path connectivity from the power modules and the reset module to the controller.
   b) Then if the paths are connected, the hardware is to be checked if the reset module has a faulty hardware.
   c) If that is correct, Then check for any spikes that might occur to microcontroller pins that might lead to reset.
   d) Then go for the firmware to check if there are any reset conditions that might occur.

5. Which of the skill categories mentioned in the role description apply to you the most? Feel free to pick multiple, just put your most comfortable competency first. (If your background is unusual, explain in a few words what skills & background you bring!)

   My strongest competency is **embedded firmware development**, followed by **real-time systems and sensor integration**. I also bring experience in **ASIC and FPGA design, hardware design, and IoT system architecture**, which lets me bridge hardware and software effectively.