MUHAMMAD YASIR KHAN

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Education

- **National University of Sciences & Technology** — Islamabad, Pakistan
  BE. Electronics Engineering — *Oct. 2008 - Aug. 2012*
  - Relevant courses: Embedded Systems, Embedded C, Computer Networks, Digital and Analog Electronics and Systems Design, Operating Systems, Microprocessors, Verilog, Signal Processing

Skills

Languages: ARM GNU Assembly, C, C++ (11), JavaScript (ES6), Python

Software: Firmware, customized Embedded Linux distribution, Linux kernel/driver development, Linux device-tree and BSP work, u-boot customization, embedded application development on RTOS (μC/OS- II and FreeRTOS), source management using Git

Hardware: PCB design and development, Electronic circuit design, use of electronic tools (digital logic analyzer, oscilloscope), electronic prototyping, reading datasheets, manuals and schematics

Processors/Platforms: ARM Cortex M4, STM32, ESP8266, Beaglebone Black

SDK/Frameworks: Yocto Project, STM32CubeMX, ESP IDF, ROS

Communication protocols TCP/IP sockets, MQTT, UART, I2C, SPI, USB

Tools: Kicad (PCB design), Linux command-line tools for compilation, make, cmake

Documentation Writing technical documents, user guides, reviews

Certifications

- Robotic Software Engineer Nanodegree Term 1 — *Udacity*
- ROS for Beginners: Basics, Motion and OpenCV — *Udemy*
- Embedded Linux kernel & driver development — *Mentor Graphics*
- ARM Cortex M4 microcontroller programming — *Mentor Graphics*
- Embedded Systems Programming on ARM Cortex-M3/M4 — *Udemy*
- ARM Assembly Language from Ground Up — *Udemy*
- Introduction to RTOS — *Udemy*
- Beginner to advanced C++ programming — *Udemy*
- Advanced C++ programming — *Udemy*
- Modern C++ Concurrency in depth — *Udemy*
- The Complete JavaScript Course 2021 — *Udemy*
- 2021 Complete Python Bootcamp — *Udemy*

Experience

- **Nixplay** — Sheung Wan, Hong Kong
  Embedded Software Engineer — *Jan. 2019 - present*
  - Developed a multi-threaded firmware for a more responsive digital photo frame and resolved multimedia playback issues.
  - Developed a customized Linux OS with web browser engine enabled for internet-connected digital frames based on custom hardware.
  - Developed the application using Qt5, QML and JavaScript, running on the above platform.

- **The Hong Kong Polytechnic University** — Hung Hom, Hong Kong
  Lead Engineer — *Aug. 2017 - Oct. 2018*
  - Developed hardware and software for an IoT based hydroponic farming system.

- Designed and fabricated a small footprint wireless environment sensor board with SMT components and wrote it's firmware.
- Developed the nutrient level monitoring and auto-feed system.
- Developed the plant imaging system using embedded serial camera and lens assembly.
- Developed the firmware for LED based grow lights.
- Setup a local IoT server for data collection and device control.
- Modified a commercial wine keeper to grow plants inside it.
- Developed a touch based control panel with UI written in Qt5 to control the wine keeper.

- **Mentor Graphics** Lahore, Pakistan
  Sr. Software Development Engineer *Nov. 2013 - June 2017*
  - Developed customized Embedded Linux using Yocto Project.
  - Developed Yocto Project based Linux BSPs for different hardware platforms including iMX6Q and Xilinx Zynq.
  - Debugged and resolved Linux system issues.
  - Became proficient in configuring/patching/compiling the Linux kernel and writing device drivers.
  - Developed the Mentor's multi-core AMP framework for booting the Linux and Nucleus RTOS in parallel on separate cores of a multi-core ARM processor with a shared memory based communication channel and zero-copy transfer.
  - Contributed in open source community and successfully submitted several patches upstream.

- **East West Infiniti (Pvt) Ltd.** Islamabad, Pakistan
  System Design Engineer *Oct. 2012 - Oct. 2013*
  - Worked on developing an autonomous air-boat. Integrated various on-board sensors and wrote the PID based control software for the GPS navigation.
  - Developed the SONAR based sea tide measurement system.
  - Added the wireless connectivity to different products using Wi-Fi, Zigbee and GPRS.
  - Designed electronic circuits and wrote firmware for the company's numerous projects.

Projects

- **Firmware for Digital Photo Frame:** Wrote a multi-threaded firmware for a mass-produced consumer electronic device capable of multimedia playback. Resolved multimedia issues and utilized the limited resources efficiently to create a responsive user experience.
- **Embedded Linux using Yocto Project:** Developed customized Embedded Linux systems for multiple processor boards using Yocto Project. Developed Linux userspace applications, libraries and kernel drivers.
- **STM32RTOS:** A hobby project of creating an RTOS from scratch for STM32 series ARM Cortex M4 microcontrollers. See https://github.com/mykhani/STM32RTOS for details and the features implemented so far (priority based scheduling, build system).
- **IoT based hydroponic farming:** Developed the hardware and software for IoT based hydroponic farming system. Wrote RTOS based firmware for custom designed wireless environment sensor, LED control and automatic nutrient monitoring and control system. Setup a local IoT web server based on ThingsBoard. Also developed the touch control panel for the device based on Qt5 and Linux.
- **Beaglebone Green Product Review:** Participated as a reviewer in the Beaglebone Green roadtest program conducted by Element14. As a part of the test, explored creating a robotics development platform based on Beaglebone Green running ROS and the Grove connector system of the Beagleboard Green. Submitted a detailed report on the Element14 community website.
- **Technical Blogs:** Here's the link to my medium profile where I've written few technical blogs, including the above mentioned Beaglebone Green product review. **https://medium.com/@yasir.gandapur**
- **Autonomous air-boat:** Worked on the development of an air-boat including its mechanical assembly and electronics. Integrated electronics and sensors and implemented a PID based control software for GPS navigation. Conducted extensive experimental testing of the boat in a public lake.