Fábio Pereira

Portfolio 2002/2016

Last updated July/2016
This was my first Portuguese book. Released in 2002, it covers the PIC16F assembly programming (focus on the 16F628). It was 360 pages, covered all peripherals and featured several examples, including three complete projects (a digital clock, a frequency meter and a digital Voltmeter).
The ADI-101 was a product designed in 2003 for the screw manufacturing industry. It was used for quality control, monitoring some machine parameters (cold forming) that could show when a tool or mold was damaged or broken. The system comprised a hardware (build around the PIC18F252) and a PC software for configuration/monitoring.
This was my second Portuguese book, released in 2003. It covered PIC16 and PIC18 programming using C language (CCS C compiler). The book is still a bestseller with more than 10,000 copies sold. It has 360-pages and covers C programming with a lot of examples, including a chapter with examples of 1-wire bit-banging, SPI bit-banging, I2C bit-banging, serial bit-banging, CAN and LIN, LCD module interfacing, keyboard interfacing, analog interfacing and a lot more!
This was my third Portuguese book, released in 2004. It covers Motorola/Freescale/NXP’s HC908Q microcontrollers family programming. It features an assembly chapter and also a C chapter. There are several examples both in assembly and C using the Codewarrior IDE.
Micro 433MHz Transmitter

This was a design done in 2005/2006, it is a small 433MHz transmitter designed to be used on keyless entry systems and car security systems. It used a MSP430F2001 and featured an onboard step-up converter, battery voltage monitor and a serial protocol for manufacturing re-programming.
Microlab X1 was designed in 2005 as one of the world’s first multi-platform development boards. The main CPU module was interchangeable, allowing the user to use microcontroller from different manufacturers. It also featured an onboard 40-segment LCD glass, 3-digit LED display, 16x2 LCD module, SPI RTC, I2C EEPROM, 4x3 keyboard, 8 LEDs, relay output, 2 opto-isolated inputs, two analog inputs, 6 servo outputs and two expansion slots for add-on cards.
MSP430 Microcontrollers: Theory and Practice

This was my fourth Portuguese book, released in 2005. On its 416 pages it covered Texas Instruments MSP430 microcontroller family (1xx and 4xx), most peripherals were covered, including ADC, DAC, DMA, serial modules, LCD controller, etc. The book also featured graphic LCD libraries and examples along with several other usage examples. This was my first book to use a IAR compiler.
This was a huge challenge. In 2005, we were contacted by an entrepreneur who had a very special project: He was designing a military 8-wheel truck and he needed an onboard computer for a press presentation, but the deadline was TWO WEEKS! I had to design and build a special I/O board (PCF8574 based), design a graphical user interface (using our Microlab X1 board and an MSP430 module), build a prototype and test it all some 150 km away from our home base! It was a huge challenge for such a small company, but I managed to design and build the hardware and software to achieve our customer objective and the press presentation was a success!
This was my fifth Portuguese book and the second challenge I had in 2005! I was contacted by Freescale’s Brazil office and they wanted me to write a book for their new chip that was launching in two months: the HCS08Q family. I had a two-month deadline to write a complete book about a chip that I didn’t even know! I accepted the challenge only because I knew the HCS08 architecture was very similar to the HC08 (which I knew very well). So in two months I was able to publish a 208-page book covering several details and all peripherals of the MC9S08QG8 device.
This was a design for a customer back in 2007. V-truck was a security system to protect trucks from theft. It was a master/slave system where the master unit was installed inside the truck and slave units where installed in the trailers. When a trailer was connected to the truck, the system automatically identified the slave unit. Before starting a trip, a trip password was loaded into the main unit, locking all slaves to it. If one of the slaves was disconnected, the whole system blocks and all slave units triggered valves that drained the compressed air from the brake system causing the truck and trailers to brake and stay braked (the braking was not sudden and allowed the truck to stop safely). The main unit also had GPRS communication and GPS location. It could be remotely managed and all data was sent to a central server.
This was my sixth Portuguese book, released in 2007. On its 448 pages it covers the ARM7 CPU, assembly instructions, interrupt system and the ST’s STR711 peripherals. There is a huge chapter covering USB communication, from the basic theory to a complete HID mouse device built from scratch. The book covered the IAR EWARM IDE and also GNU GCC.
HCS08 Unleashed: Designer’s Guide to the HCS08 Microcontrollers

This was my first English book, released in 2008 and sold through Amazon.com. On its 412 pages I covered almost all available HCS08 devices. The book has several tens of examples and I consider it a huge success as it achieved 10 reviews in Amazon, all of them gave it 5 stars!
Motorcycle Anti-theft blocker

This was a design from 2009. A motorcycle anti-theft device which disables the engine and avoid/difficult theft. It uses a presential system and is paired with a remote control (not pictured) which transmits every 10 seconds. If the system does not detect a transmission within a time window (45 seconds) it fires an alarm and blocks the engine.
This was a big project from 2009/2010. We designed a complete electronic control unit (ECU) for mono-cylinder combustion engines. It featured a 32-bit Coldfire MCF51JM128 MCU, serial and USB communication, a beautiful desktop application for configuration and real-time monitoring of every parameter of the engine. It featured ignition and fuel control, idle motor/solenoid control, fuel pump control and several sensor inputs (throttle position, MAP, air and engine temperature, Lambda, etc). It also featured an onboard datalogger capable of storing all engine data for several minutes.
This was my eighth book, released in 2010. It covers PIC18F4520 programming in C using the C18 compiler. The book has several examples.
This was my ninth book, released in 2012. It covers the Renesas RL78 family of 16-bit microcontrollers. The book covers most peripherals and has a lot of usage examples. It focus on the IAR EWRL78 IDE and compiler. The book was backed by the Renesas Brazilian Office and has a free PDF version.
James is my first Android App, released in 2015. I always wondered why a smartphone couldn’t be smarter. Why couldn’t it remind me of tasks better than a calendar? That’s why I created James: it is a task/appointment manager which is unique because it can remind you of a task in the right place where it should be completed. So if you have goodies to buy at the grocery, James will remind you only when you are there! It can remind you of tasks/appointments when you arrive/leave home, your work and almost any place! James uses WiFi scanning to recognize places (and also GPS but as a secondary location system). James was built from scratch in 4 months, it includes internal SQLite databases, foreground and background services, webservices (with JSON and PHP), I had to learn PHP and had to setup my own SQL database.

James is available at the Google Play Store:

Serial Servo Controller/Recorder

This design was completed in July/2016. It is a board designed for standalone control of animatronics shows. It can operate as a MiniSSC servo controller or it can operate as a recorder, storing a full show into its 32Mb flash memory. It also can playback shows from the memory and associated MP3 audio files. Due to the short schedule (2 months) and low budget, the board was designed around a 32-bit Coldfire MCU (MCF51JM128) and relies on a serial MP3 module to playback MP3 audio files. The board also features 3 inputs for show selection, 8 5-Volt servo outputs, 8 12-Volt servo outputs, 2 relay outputs, one EIA-232 serial interface and a USB interface (not mounted).