


Elias Kanelis


Embedded Systems Engineer

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 tedcreations.github.io

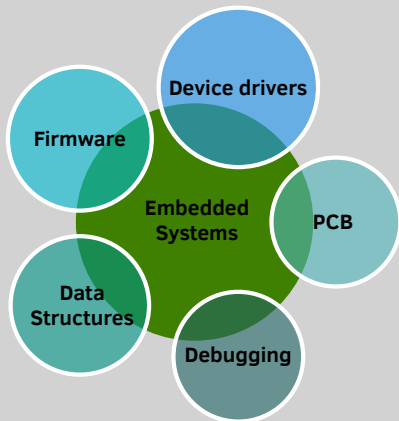
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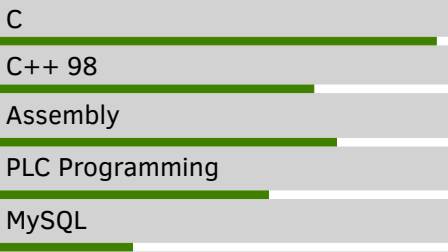
 TediCreations

Skills

Overview



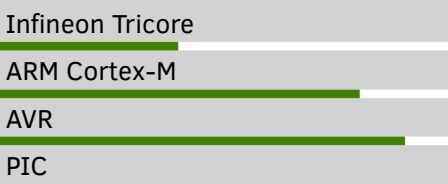
Programming



Scripting



Microcontrollers



Summary

My main interest is embedded and mechatronic systems. I love how algorithms control machines at will. Creativity is something that comes easy with me and most of it is expressed through out my art. Innovation is something hard to achieve and I try my best to examine the new Internet of Things field for new opportunities.

Education and training

2006 - 2014 **BSc., Automation Control Engineering** (GPA: 7.23/10)
Technological Educational Institution of Chalkida, Greece
Thesis: Development of a virtual reality software library for use in SCADA systems

2013 **Seminar, NI CompactRIO and FPGA design** National Instruments

2010 **Seminar, Electrical Safety** ABB Limited

Professional Experience

Apr 2022–Present **Embedded Systems Engineer** Kenotom I.K.E.

Worked on an autonomous navigation system that involves path planning, tracking and motion control for autonomous vehicles.

- Ported a real-time multithreaded Linux-based decision-making algorithm to an Infineon microcontroller under PxBos RTOS.
- Abstracted the reading and writing to EEPROM as if it were a filesystem.
- Designed and implemented the Can bus and its messages with pacmod2.
- Implemented the CI/CD pipeline using GitHub Actions and conducted testing/flashing on the target with Trace32 in a custom Docker image.
- Analyzed UDP (Ethernet) and Can bus traffic using Wireshark.

Played with: Infineon Aurix TriCore (TC387), TtControl ECU

Tools used: C, gcc, gdb, Docker, make, Linux, GitHub Actions, CI/CD, Can bus, pacmod2, UART, PxBos, Trace32, Wireshark, ISO 26262, MISRA C

Oct 2019–Mar 2022 **Embedded Systems Engineer** Kenotom I.K.E.

Worked on a transmission control unit for use in a hybrid car.

- Implemented safety acquisition of ADC values.
- Configured the watchdog, its manager and applied program flow monitoring and other safety-related best practices.
- Designed and implemented Functional Safety Software based on automotive safety requirements.
- Debugged and analyzed integration problems.
- AutoSar configuration.

Played with: Infineon Aurix TriCore (TC399), many proprietary ICs

Tools used: C, Tasking Compiler, Trace32, AUTOSAR, ISO 26262, MISRA C

RTOS - OS

GNU/Linux (Posix)

Windows

FreeRTOS

QPC (RTEF)

PxRos

Tools

Eagle

Altium Designer

KiCad

P-Spice

Multisim

Git

Doxygen

Matlab (Core)

Labview

Protocols

U(S)ART

I2C

SPI

LoRa

Mobdus

Can Bus

NMEA 0183

Language

Greek

English (First Certificate in English)

German (Zertifikat Deutsch)

Mini Projects

HSM - A hierarchical state machine in C without the use of dynamical allocation.

sString - A C string module that does not use dynamical allocation.

Real Engine - Developed a custom Game Engine in C++ with the following libraries: Irrlicht SDK, Havok Physics and Animation SDK, LUA scripting language and Irrklang SDK.

Feb 2018–Jun 2019

Embedded Systems Engineer

DeepSea Technologies I.K.E.

Developed a data acquisition network of sensors for sending vessel data to a Neural Network that predicts oil consumption, performs ship monitoring, and optimizes critical performance parameters. Worked as a 'one-man' firmware, software, hardware and field engineer under extreme pressure and tight deadlines.

- Developed the data acquisition user space application, low-level device drivers, and designed the PCBs.
- Automated hardware testing for defects using Python.
- Conducted installations on client vessels.
- Assisted in resolving a major wireless networking issue within the vessel's Engine.

Played with: Raspberry Pi 3, sx1276, mcp3424, lsm9ds1

Tools used: Python 3, C, mbpoll, KiCad

2014–Jan 2017

Founder

"Beehive" weighting and antitheft system

Design and manufacture of a product based on ARM Cortex-M microcontroller and sensors that help beekeepers keep track of their amount of honey, temperature, humidity and GPS status (anti-theft) in beehive farming.

- Designed the product from birth to finish. (pending battery management)
- Tried to be MISRA C compliant as an exercise to myself.
- Followed Test driven development workflow.
- Developed an AT command parser.

Played with: stm32f072rb, atsam4l, atmega8, m41t81, mcp3421, mma8541q, sim900

Tools used: TDD, C, gcc, gdb, valgrind, GNU Make, MISRA C, cppUtest, CMSIS, FreeRTOS, Altium Designer

2015–2017

Teacher, Part-time

Efodia Karieras I.K.E.

Prepared students for the Cambridge/Vellum Diploma in IT Skills.

- Organized an educational workshop on microcontrollers and the Arduino platform.

Played with: Arduino

Tools used: Atmel Studio 7, Arduino IDE

2017

Freelancer

Aftermarket Marine Parts, Piraeus

Redesigned an electronic fuel injection controller PCB based on an old circuit from 2005 called Megasquirt, which consisted of obsolete parts. This redesigned controller would manage a speedboat's electronic fuel injection engine according to the customer's requirements.

Played with: Megasquirt 3 Module, 68hc908

Tools used: Eagle

2016

Freelancer

Client

Designed a solution that notifies the user/client over a GSM network about the status of an AC motor used as a pump for watering cotton fields.

Played with: atmega8, sim900

Tools used: Eagle, Atmel Studio 7

2014

Freelancer

UV PCB Developer Box

Designed a 'UV PCB developer box' capable of producing dual-layer PCBs and equipped with a timer for automation.

Played with: atmega8

Tools used: Eagle, Atmel Studio 7

Sep 2012–Jan 2013 **Electronics Engineer**

Sielman S.A.

- Repaired electronics of the MIM-23 Hawk missile system.
- Designed and manufactured a test bench for DC generators in Hummer SUVs using LABVIEW.

2011–2012

Automation Engineer

Automation System Hellas S.A.

- Developed a fire detection and TMS control SCADA application for Egnatia Motorway tunnels in Ioannina, Greece.
- Developed a production process automation SCADA application for the Culture line at OLYMPUS DAIRY INDUSTRY S.A. in Larissa, Greece.
- Repaired malfunctioning PCBs that controlled pneumatic valve.
- Performed PLC and SCADA programming, testing and debugging.

Summer 2010

Internship

Kalogiannis Koutsikos Distillery A.B.E.

- Performed electrical machinery maintenance.

Summer 2008

Internship

Soukos Robots S.A.

- Participated in the development of an innovative, smart, fully automated wastebin controlled by a SIEMENS Logo PLC.

Theoretical Knowledge

Classical and Modern Control Theory of Dynamical Systems

- Classical and modern Control Theory of dynamical systems.
- Stability, Controllability and observability.
- Adaptive, Hierarchical, Intelligent, Optimal, Robust and Stochastic control.
- System identification.
- Neural network and fuzzy logic control.

Robotics

- (Inverse) Kinematics and dynamics theory of movement.

Mechatronics

- Electronics.
- Sensor data acquisition and actuator control.

Telematics

- SCADA systems.
- M2M interface.

Telecommunications

- Laplace, Z-transform.

Spare time activities

- Playing music (blues and Greek rebetiko) with Tzouras, Cretan lyre, or the guitar.
- Trying to live a zero-waste life. This is a challenge when living in the city.
- Drawing comics and bringing to life unique fantastical characters.
- Hiking, bushcrafting, camping and cooking over an open fire.
- Reading lots of books.
- Building stuff.

August 12, 2023