Curriculum Vitae

Name: Emmanouil Tsachalidis
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Academic studies / diplomas / certificates:

1990 – First certificate in English (Fluency in verbal & written language)

1990-1993 – 3 years studies at Technical school of Kavala/Hellas. Graduate on electronics (analog, digital electronics & automation)

1993-1997 – Studies at ADSEN Macedonia (university level) graduate as Captain C' class on merchant vessels. Trainned on astro-nautical calculations, nautical chart handling & correcting, stability of marine vessels, GMDSS system comunication trainning (VHF/MW/SAT communications), electronics in Radar systems (circuit stages of a radar). Training in safety & fire fighting appliances on board marine vessels.

2012-2013 – 1 year studies in Paphos technical school as an Electrical engineer in 3-phase installations up to 150KVA in residences & factories.

2016 – Licenced electrical engineer up to 150KVA certificate after a successful examination test carried out by the Electro-mechanical Services of Cyprus.

Employment history:

1997-2007 – Service on containers vessels as apprentice, second officer, crew member of tub boats & skipper on cruiser boats. Service list info here.

2008-2009 – I was employed as a purchaser in Columbia Ship. Management. My duties were focused on purchasing for marine vessels. I also did C++ programming related to vessels' approach & departure to ports calculations.

2009 – I started my own led lighting business – MNS Energymax.

2015 – I closed down my business.

2017 – I was employed as a elevator technician in charge of mechanical installation and electronics. I was in charge of the installation of the metal guides & parts of the elevator inside the shaft, distributing the wires and installing all electronic peripherals and eventually adjusting & fine tuning all parts of the elevator.

2018 – I was employed as a R&D hardware & software engineer in Recursive Engineering. I worked as a PCB designer, hardware & software developer on a 50KW motor controller based on the Field Oriented Control concept. I re-designed an old schematic from the RS DesignSpark schematic to CadSoft Eagle as well as doing a few optimizations, additions and taking a few problem solving actions. This was a 6-layer PCB based on a Microchip 16 bit dsp microcontroller. I also helped with the optimization of the core source code (written in C) of the motor controller.

2019 – The Motor controller project was ceased by the investors.

2020 – I was employed by CI-Compass member of NSO cybersecurity company as an RF hardware R&D engineer. I worked with RF components like cables, antennas, RF amplifiers and exercised my abilities in RF measurements with a spectrum analyzer in order to evaluate SWR conditions, amplification vs frequency response etc. I designed a SMPS solution in order to improve the performance of the WiFi box RF amplifiers. I also started designing a mini pc carrier board with high speed interfaces such as USB 3.0, PCI express, Ethernet PHY and other serial interfaces like SPI, UART, I2C.

2020 – I started developing an IoT software solution in C/C++ on Linux that communicated via a virtual serial interface with the SIM7600 chipset by using AT commands. The SIM7600 chipset would then communicate with a MQTT broker in order to remotely send or receive status reports, sensor data, json formatted data and more.

2020 Sep – NSO Group closed down the R&D department in Cyprus.

Web development history:

2009 – Design of my business website using **Ruby on Rails** framework, JS, HTML, CSS, MySQL, Passenger & Apache Server. See the website here.

2015-2016 – Development of a Virtual Private Server control panel based on framework **Ruby on Rails**, HTML, CSS, Javascript, Jquery, MySQL, Passenger & Apache Server. This control panel made my life so much easier to configure my VPS through a web-GUI that controlled many aspects of the server's firewall, mysql server, apache server, DNS server, sub-domains and much more. More info here.

2016 – Development of the Smart List project based on Javascript & Jquery. More info here.

2016-2017 – Development of a Website Builder project based on **Ruby on Rails**. This is a project aiming to help users that lack programming skills to easily develop their own website with the push of a few buttons while others that have advanced knowledge can still use that to customize the front end to fit their needs. More info here.

2020 Oct – I started developing a C++ server, Front end with JS, HTML & CSS and **Ruby on Rails** Back end of a web application for various sensors. The server was initially implemented with Ruby but ended up being unable to handle the required speed of at least 50K sensor signals per second. I re-designed the server with C++ which proved to be a success. The requirement of speed was comfortably handled by the server. It is however work in progress. This application is aiming to create a platform of sensors that provide graphical history in real time, automate sensor data based on user's defined conditions and finally send digital but also analog notification signals in order to fully automate an entire industrial scale system.

Software projects history:

1997 – 1 year of training in language C based on my senior thesis while studying in ADSEN Macedonia with a goal of learning the C programming language and developing an application in DOS environment that implements nautical calculations of great circle & mercator's sailings.

2006 – Development of an experimental windows application with Borland C++ Builder that uses a GPS receiver and implements nautical calculations between waypoints (points of course change) while serving as a second officer on board container vessel MSC Sicily. More info here.

2007 – Development of SMPS software with Borland C++ builder based on flyback topology that calculates various parameters of components such as main transformer primary & secondary turns, output capacitor etc based on the requirements that the user enters. More info here.

2007 – Development of software with Borland C++ builder that calculates the compensation network values of the LM5035 SMPS controller and provides various graphical information about the stability phase margin, output LC filter etc. More info here.

2018-2019 – Development of an openGL ES library for integration with SDL2. This project was developed in C++ aiming to show graphical data on a SBC (raspberry, orange etc) in real time from the motor controller DSP microchip microcontroller above through a high speed serial differential interface in order to make debugging a lot easier. More info here.

Hardware projects history:

2006 – Design & implementation of a 2-ch digitally programmable power supply based on an Atmel mega32 microcontroller and a 128*64px lcd. The implementation included both the pcb design and programming of the mega32 using CodeVisionAVR in language C. More info here.

2006 – Design of a digital Inductance meter for detecting leakage inductance of a SMPS high frequency transformer while trying to design a flyback topology isolated converter. More info here.

2010 – Design & implementation of a Digital Power analyzer aiming at 50Hz loads based on an Atmel mega64 with a graphical 128*64px lcd that provides true RMS measurements, True power, Apparent power, Power factor and graphical representation of voltages & currents being

measured. The implementation included both the pcb design and programming of the mega64 using CodeVisionAVR in language C. This was built during the period that I maintained my own led lighting business. More info here.

2011 – Design & implementation of a 3-ch PWM dimmer that worked along with a wireless module in order for me to use it in custom wireless LED lighting dimming solutions. The PCB was designed to fit exactly inside general purpose junction boxes. An Atmel microcontroller was used and programmed based on the needs of every individual case. There were cases were one single remote control was used with multiple dimmers in order to control the lighting of an entire shop. This was built during the period that I maintained my own led lighting business.

2012 – Design & implementation of a custom spot light aiming to replace 50mm halogen spots. The spot was designed in autocad 3D and a thermal analysis was carried out in order to calculate the led's junction temperature across various ambient conditions during full intensity operation. The spot was actively cooled down with a tiny noiseless fan in order to maintain a temperature under the threshold of 65 degrees. The led array used was a US genuine BridgeLux part which was driven by a high PF led driver manufactured by Huarui. This was built during the period that I maintained my own led lighting business.

2012 – Design and implementation of a custom Led lighting fixture including main reflector, electronics & thermal analysis. The design of this lighting fixture was based on the old metal-halide rings that were used with this custom solution. Without any obvious visible change to the average naked eye this solution turned hundreds of meta-halide lighting fixtures to led based with a greater than 60% savings and equal light intensity as well as dimming capabilities. This was built during the period that I maintained my own led lighting business.

2013 – Development of a DSO project with a STM32 discovery dev board & a 5 inch 800x600px SSD1963 resistive touch lcd panel. This project was aiming at experimenting & discovering the inner functions of a digital storage oscilloscope. The on-board 12-bit LCD was used to digitize an analog signal which was then processed and displayed on the lcd panel using DMA (direct memory access) for less overhead on the CPU. More info here. Youtube video here.

2014 – Development of an electrolysis solution PWM regulator based on an Atmel mega168. This project was developed for saving fuel purposes in automobiles (cars, tracks, buses etc). 200 units were designed and sold to a company based in Bulgaria. A complete product including the PCB design & electronics, software development, front face sticker with embedded buttons design and datasheet preparation was implemented. More info here.

2014 – Development of a 12bit ADC driver on Altera FPGA dev board DE0-Nano. Verilog was used to program the Cyclone IV chip in order to work with the 12bit ADC ADC128S022 that was on board. A potentiometer was used to trigger the ADC input with 0-5V and the digital value result was redirected to the on-board 8 leds. The objective was to start my introduction and experimentation with FPGAs and get hold of the logic of programming one.

2019 – I started the research and development of a high voltage true differential high bandwidth ~100MHz oscilloscope probe as well as the development of a 2-ch 12bit 100MSps DSO. I worked on this project almost through the entire year of 2019. It is still under development.