

Pablo Slavkin

Resume

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13/12/1976



"In the tools, as in the instruments, what matters is the artist"

Presentation

I'm an electronic engineer from School of Engineering and Technology ITBA, recently graduate as Specialist in Embedded Systems and studying a Master in Embedded Systems from University of Buenos Aires, UBA.

I developed my career working in product development area of several national companies and in research in state institutions.

I was in charge of an electronic engineering studio offering electronic design and production services and I am currently working as a freelance electronic developer.

I work daily designing embedded electronic equipment executing tasks such as:

- Taking requirements and planning acceptance tests of hard and soft.
- Schematic design, PCB, simulations, assembly, 3D modeling and machining.
- Coding for real time in C / C ++ in bare metal or over RTOS.
- Bash and Python scripting over Linux and embedded Linux.
- Codification and execution of the unit tests and management of continuous integration tools.
- Assembly and start-up of prototypes and assembly line documentation.

I am very pragmatic, committed and enjoy solving complex problems in a creative way by exchanging ideas with my peers I prefer down-top developments using Agile concepts to keep the product functional from the beginning.

I have an electronics workshop showed in figure 1 and in the [video](#), with tools as:

- Assembly line of SMD/TH plates, pasta stencil, pick and place, reflow oven and wave soldering machine.
- Reworking and manual welding tools.
- Stock of SMD and TH materials of current and specific use.
- CNC machining center.
- Machine for cutting and laser engraving.
- Several machines for 3D printing.
- Generators, Oscilloscopes and Advanced Instrumentation for measurement and diagnosis.
- Electronic tools for firmware development.

These tools, my experience, technical ability and frequent academic updating allow me to unwrap in most instances of the development of a professional embedded electronic equipment.

Just follow the links in each section to see videos pdf's and detailed information.

You could check my up-to-date resume [here](#).

Education

2019–present **Master's degree in Embedded Systems** , UBA - University of Buenos Aires , Buenos Aires , In course .

[See program](#)



figure 1: Development lab at Bariloche, 2019

- 2018–2018 **Specialization in Embedded Systems**, FIUBA - University of Engineering of Buenos Aires , Buenos Aires , Average 9.33 .
[See program](#)
- 2007–2016 **Doctorate in Engineering**, UTN - National Technological University FRBA , Buenos Aires , Average 10 on 3 approved subjects + 3 late due .
Mention Digital processing of images and signals. Suspended by moving to another city. [See program](#)
- 1996–2005 **Electronic Engineering**, ITBA - Technological Institute of Buenos Aires , Buenos Aires , Average 6.5 .
[See program](#)
- 1990–1995 **Electro Mechanical Technician**, ENET Nº1 Brigadier General Pascual Echagüe , Concordia, Entre Ríos , Average 8.5 .
- 1982–1989 **Primary School**, Velez Sarsfield School , Concordia, Entre Ríos , Average 8.5 .

Experience

Professional

- 2020–Present **Design and development of BLDC power stage**, [Engineered Arts, England](#).
I work as a hardware engineer, making the electronic design, choosing components and topology for the power stage of a new BLDC servo drive. I work remotely with a team of specialists.
- 2019–Present **Freelance Electronic Engineer**, , , .
Personal entrepreneurship Electronic design services, hardware, firmware and electronic equipment.
- 2019–Present **Development of a PMSM servomotor controller**, [Nanocut, Moldavia](#).
For a company in the industrial machinery field, I work in the development of an integrated servo controller for a permanent magnet synchronous motor. It'll be used for the improvement of the actual machinery. [See portfolio](#).
- 2019–2019 **Consultant and CNC software development**, [Wolfcut](#), Valencia, España, .
I worked in the implementation of a production line management software tool. I've also developed a plugin for improve the capabilities of the CNC software, adding an automatic tool changer, an automatic tool measurement, and others features. [See portfolio](#).
- 2011–2019 **Development and production of electronic equipment**, [Grupo Noto](#) , , .
I develop and manufacture a whole line of aesthetic electro medicine electronics equipment, hardware, firmware and production. [See portfolio](#).
- 2012–Present **Development and production of electronic equipment**, [Piscina Natural](#) , , .
In conjunction with the company was developed a system for the generation of chlorine from saline water was developed to keep the pools clean. [See portfolio](#).
- 2011–2016 **Consultant and developer of electronic equipment**, [Softron](#) , , .
Consulting and development of electronic equipment and solutions for energy measurement and monitoring using Zigbee wireless and GSM technologies. [See portfolio](#).
- 2011–2017 **Consultant and developer of electronic equipment**, [Grupo Koner](#) , , .
Consulting and development of equipment and electronic solutions for the automatic vehicle location, AVL. I worked mainly in the development and integration of an RFID card reader for drivers registration. [See portfolio](#).

- 2005–2019 **Director in engineering company**, [disenioconingenio](#) , , .
 Personal entrepreneurship Engineering study that offers electronic design services to companies, with ability to develop and manufacture electronic equipment, hardware, firmware, software, mechanics, PCB routing, assembly of PCB's SMD and TH, 3D printing, CNC machining, laser cutting and engraving and commercialization of equipment for access control RFID, monitoring of Ethernet temperature, automation of machines, converters of protocols, etc. [See portfolio](#).
- 2011–2014 **Consultant and developer of electronic equipment**, [Seconsat](#) , , .
 Consulting and development of electronic accessories for the AVL business. I work mainly in a new multi sensor wireless dongle for AVL integration. [See portfolio](#).
- 2003–2005 **Electronic equipment developer**, [Digicard](#) , , .
 Company referring to the national level in the area of access control. Work was done on the development of an RFID reader of 125khz for the line of access controllers. I participated in all the stages since the requirements request, schematic design, PCB layout, prototype, start-up, firmware, and production documentation. The reader is actively marketed by the company. [See portfolio](#).
- 2002–2003 **Firmware developer for microcontrollers**, [Pump-Control](#) , , .
 Company dedicated mainly to the design, development and production of electronic controllers for the distribution of hydrocarbons. Work was done in the area of firmware development for 8bit microcontrollers of the Atmel line, implementing 1-Wire communication protocols, access control and dispenser control fuel.

Teaching

- 2020–2020 **Digital signal processing, introduction course**, [University of Buenos Aires, UBA](#).
 Within the framework of the Master in Embedded Systems of the UBA, MSE, a course on digital signal processing applied to embedded systems was taught, including subjects such as: quantization, convolution, correlation, discrete Fourier transform (DFT,FFT).[See program](#).[See recorded classes](#).[See course material](#)
- 2017–2017 **Introduction to robotics**, [Siglo XXI School](#) , , .
 A day of introduction to robotics was given for students from the third to fifth year, showing the history, basic concepts and culminating with a practice in different commercial platforms [See certificate](#).
- 2004–2004 **Altera FPGA programming intensive course using Quartus II**, [ITBA](#) , , .
 An introductory course with practical activities was carried out using an Altera evaluation board. [See material](#).

Research

- 2015–2016 **Scholar in the National Atomic Energy Commission**, [CNEA](#).
 I worked as a fellow in the completion of a fully developed PET (Positron Emission Tomography) in the center on which the doctoral thesis plan is developed. Particularly, work is done in the area of acquisition and processing of digital signals on high performance FPGA. The scholarship is terminated doubt as a move to another city. [See portfolio](#), [see material 2015](#) , [see material 2016](#).
- 2009–2009 **Assistant in the Research Center of Lasers and Applications**, [CITEDEF](#).
 I worked as an assistant of Dr. Jorge Codnia and Lic. Laura Azcárate in the assembly of a flow condenser, which with the help of a laser produces isotopes of interest, and the first advances in a new mass spectrometer of flight time. [See material](#).

Courses and seminars

- 2018 **LATAM 2018 Entrepreneur Competition**, [MIT - ITBA](#) , 8hs , I participated as a jury of the LATAM 2018 contest, organized between MIT and ITBA. I analyzed innovation and entrepreneurship projects from Latin America. [See certificate](#) [See details](#) .
- 2017 **LASCAS 2017 Tutorials: Dependable Digital Systems and Fault Tolerant FPGA Design** , [INVAP, Bariloche](#) , 8hs , .
- 2017 **SASE 2017, Argentine Symposium of Embedded Systems** , [UBA](#) , 8hs , [See certificate](#) .
- 2016 **SASE 2016, Argentine Symposium of Embedded Systems** , [UBA](#) , 8hs , [See certificate](#) .
- 2015 **Doctorate PSI Meeting: Models, Simulation and Fabrics Engineering** , [Favaloro, GIBIO 2015](#), 8hs , [See certificate](#) .
- 2015 **SASE 2015, Argentine Symposium of Embedded Systems** , [UBA](#) , 6hs , [See certificate](#) .
- 2015 **Advanced techniques of digital design** , [UNICEN](#) , 40hs , Advanced virtual course of techniques of digital design by engineer Guillermo Jaquenod .
- 2013 **SASE 2013, Argentine Symposium of Embedded Systems** , [UBA](#) , 18hs , .
- 2012 **Introduction to Latex** , [UP Palermo University, IEEE-UP Student Branch](#), 2hs , [Ver certificado](#) .
- 2012 **First days of signal and image processing** , [UTN, GIBIO 2012](#), 8hs , [See certificate](#) .

- 2012 **SASE 2012, Argentine Symposium of Embedded Systems**, UBA , 18hs , .
- 2011 **SASE 2011, Argentine Symposium of Embedded Systems**, UBA , 18hs , .
- 2010 **SASE 2010, Argentine Symposium of Embedded Systems**, UBA , 18hs , .
- 2008 **Conference on wireless technologies of Digi RF**, EDE2008 Electronic Design Expo , 6hs , See certificate .
- 2007 **Practical theoretical course of screen printing oriented to the manufacture of PCBs** , 32hs , See certificate , .
- 2007 **Analog performance seminar using Silabs microcontrollers** , 8hs , See certificate , .
- 2006 **Launch of Freescale RS08KA microcontrollers, accelerometers and sensors** , 8hs , See certificate , .
- 2006 **Releases Freescale Coldfire microcontrollers 32 bits** , 10hs , See certificate , .
- 2004 **Rabbit microprocessors and Dynamic C** , 24hs , See certificate , .
- 2002 **Practical theoretical course IA, Artificial Intelligence** , ITBA , 18hs , See certificate .
- 1995 **Amateur radio course with licensing LU9JGM** , Radio Club Concordia (LU9JJ) , 48hs , See certificate .

Awards

- 2002 **Initiation in research and development I+D ITBA** , 1th prize , , .
Design and Simulation of a pipeline-structured Floating Point Unit for high performance general purpose processors See material.
- 2001 **Battle Tek robots championship, ITBA Ingenio en Acción** , 3th prize , , .
Discotech Robot A fight robot was designed and manufactured based on a high speed rotating disk with 2 protruding edges that impact against the adversary and a pneumatic ramp. See certificate , see news.

Works and Publications

- 2018 **Three Axis CNC Machine Controller** , Specialization in embedded systems , , .
Final work of the specialization course in embedded systems, Director: Ing. Juan Manuel Cruz see material , see presentation , see public defense , see videos .
- 2010 **Smoothing of images by inhomogeneous diffusion** , Biomedical image processing, UTN , , .
Final work Processing of biomedical images, Tutor: Dr. Castro See material .
- 2008 **Study of photo thermal techniques applied to the measurement of gas flow.** , CITEDEF , , .
I was presented under the tutelage of Dr. Francisco Manzano and as goal of approval of Optoelectronics II. See material .
- 2004 **Design and implementation of a dynamic screen based on 3200 filament lamps with 16 gray scales and 20fps updatable by ftp.** , LampMatrix, Thesis, ITBA , , .
Under the tutelage of Professor Villamil, an advertising screen based on filament lamps was designed and manufactured entirely. See video , See material .
- 2003 **Design and Simulation of a pipeline-structured Floating Point Unit for high performance general purpose processors** , JAII0 32th Argentine Conference on Informatics and Operational Research , , .
See material .
- 2003 **Selection of the Optimum Stage Number in Pipelined Floating-Point Units** , CACIC, Argentine Congress of Computer Science , , .
See material

Technologies Experience

Programming Languages

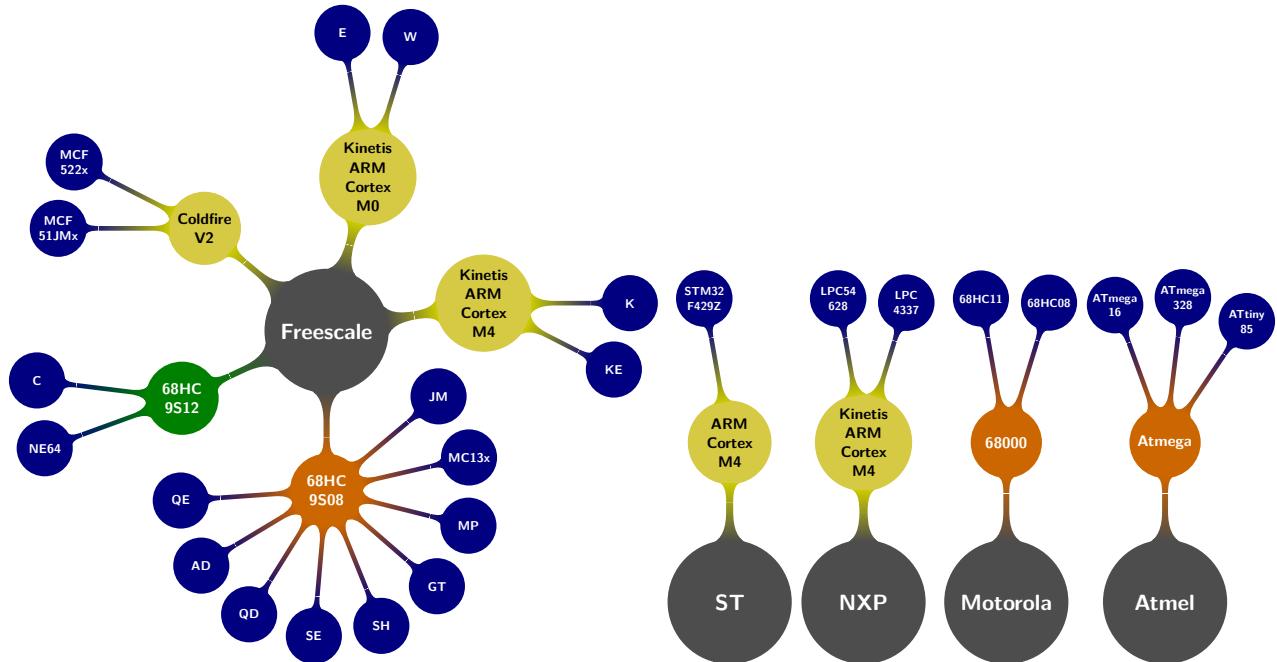
Advanced C, C++, Python, ASM assembler, Verilog, VHDL, Octave

Medium C#, Pascal, bash, makefiles, openHab

Basic Java, Javascript, HTML, css, php

Operating Systems

Advanced	Linux (Debian, Crunchbang, Bunsenlabs, Ubuntu, Slackware), FreeRTOS, Windows(Win10, Seven, XP, NT, Server2003)
Medium	FreeBSD
Basic	OSEK
Outstanding Computer Software	
Advanced	vim, git, mercurial, bash, ssh, Octave, anaconda, pyfda, jupyter, ipython, screen, tmux, Kicad, Allegro PCB Router, Orcad16 (Design CIS, Layout, Pspice), gnumeric, mutt, L ^A T _E X, Cura, Freecad, Slic3r, Pronterface, Mach3, LinuxCNC, Rhinoceros, RhinoCam, Flash MX, Borland C++ Builder, gcc, gdb, openocd, ncurses, cdk, Microsoft Visual Studio, Xilinx (ISE y Vivado), gtkwave, icarus, ghdl, cocotb, redmine, cups, Swat, Samba, cedeling, cryptsetup, Wireshark, VirtualBox, pass, gnuplot, LibreOffice
Medium	OpenOffice, Eclipse, Matlab, Jenkins, Mathcad, qemu, Arduino IDE, svn, ffmpeg, Openscam, Webadmin, SonarQube
Basic	Quartus II, Delphi, Blender
Communications protocols and digital techniques	
Advanced	Ethernet, IwIP, TCP, IPv4, SNMP, SMTP, NTP, ARP, UDP, SCI, SPI, I2C, LVDS, USB FS/HS, Zigbee, RFID, PWM, ADC, DAC, 1-Wire, RS232, RS485, PoE+, MQTT
Medium	IPv6, CAN, 6LoWPAN, IEEE 802.15.4, I2S, Radius, Modbus
Basic	HTTP, Lora, MIPI
Other technologies of interest	
Advanced	Edding CNC macro programming language, electronic board SMD mounting line, manual PCB soldering, infrared oven PCB soldering, FDM 3D printer, rigid silkscreen, PCB silkscreen, CNC machine handling, laser cutter handling , machine tool handling
Medium	PCB manufacturing, arc welding, lathe handling
Basic	
Microcontrollers, microprocessors and FPGA architectures experience	
At least one project developed using one of these:	
Colors	● 8 bits ● 16 bits ● 32 bits ● FPGA ● SBC (single board computers)





Idioms

Spanish	Oral/Reading/Writing Advanced	<i>Native tongue</i>
English	Reading Advanced Oral/Writing Medium	<i>TOEIC 2005–785 See certificate</i>
Hebrew	Reading Medium, Oral/Writing Basic	<i>Full Hebrew primary school</i>
Russian	Reading, Oral and Writing Basic	<i>Personalized curse at Moldova</i>

Sports and recreational activities

- 2016–2017 **Basketball** , Bariloche , Nahuel sport club, [facebook](#) .
Training in the club's first division squad.
- 1983–1994 **Basketball** , Concordia , J.N.Bialik , .
Training from mosquito category to be part of the first division squad.
- 1995–2004 **Basketball** , Buenos Aires , University Basketball, ITBA .
Training on the campus throughout the whole race.
- 1994– **Cycling** , , , .
- Presente Competition in cross-country category sub-23, competition in category sub-30 trialbike, amateur cycling to the present.
- 2014– **Guitar** , , , .
Presente Amateur learning of electric guitar and music.

Other activities and interests

- Physics
- Astronomy
- Motorcycling
- History of science
- Philosophy
- Cycling

Portfolio

Engineered Arts

I've worked on a new high precision, mid power BLDC power stage board. I've made the schematics, I've chosen the parts and finally I've routed the PCB board in Kicad 5.0 over 4 layers as I shot in 2

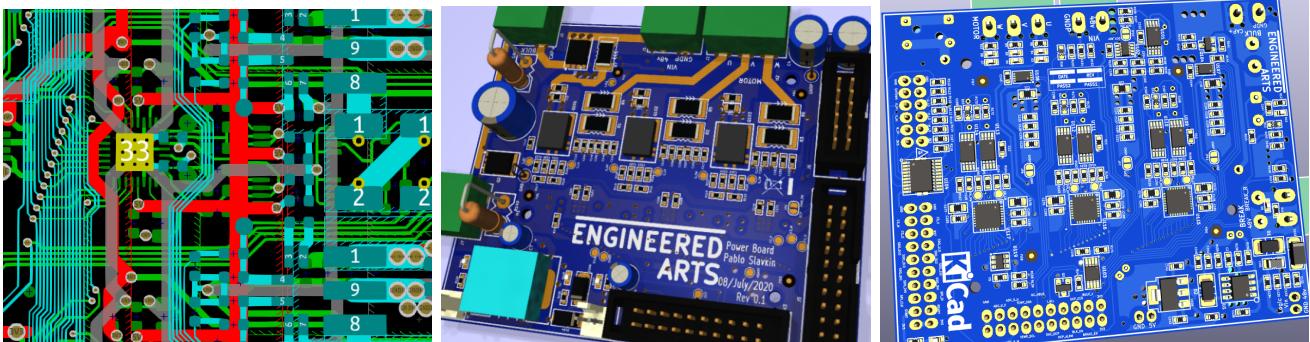


figure 2: PCB power stage for high precision mid power servo BLDC motor for Engineered Arts.

Nanocut 2.0

Working for Nanocut company at Moldova in second quarter of 2019 I've developed a PMSM (*permanent magnet synchronous motor*) servo motor controller using a Texas Instruments development board with a C2000 real-time microcontroller. I've implemented a torque, speed and position closed loop control algorithms using a relative optical encoder as a feedback. I've implemented a FOC vector control method using Clarke / Parke transforms and three nested PID's. This work will be the hardware and firmware base for a new generic servo drive for using in all the company's machines. Figure 3 shows the hardware tools and the algorithms implemented. Figure 4 shows the prototype running at



figure 3: Development tools and algorithm output plots of the PMSM servo driver

Nanocut's labs.



figure 4: Mechanical prototype used for the PMSM algorithm test, torque, speed and position

Nanocut 3.0

Working for Nanocut company at Moldova in first quarter of 2020 I've design the hardware for the new servo drive. I've made the schematics, layout routing and 3d model of the equipment. I've used Kicad 5.0 for all the process and complete the design using 6 layers traces of 6mils/6mils, and vias of 0.3 mm min. There is the link of the public github project repository [repo](#) and these is a video showing the final model [video](#). The board has the following main capacities:

- Triple real time designed 32b 200MHz core procesar
- Differential isolated incremental encoder x2
- Differential isolated absolute encoder x2
- Differential isolated step direction input x2
- Isolated RS485 x1
- Isolated CAN x1
- Ethercat slave
- Ethernet
- Isolated current measurement using LEM x6
- Isolated voltage measurement x2
- Isolated PWM IGBT signals to x12
- Isolated alarm input x2
- Isolated brake output x2
- Isolated fan RMP measurement input x2
- Isolated sigma delta input x8
- Isolated NTC temperatura sensor x4
- Isolated 1-Wire bus x1
- SPI LCD interface for EVE touch screen modules or basic characters LCD
- Dual isolated power supply's
- Some others minor features

With these capabilities the board could drive two PMSM motors at the same time and many powerful possibilities. In the figure 5 I show some pics of the design process. In the figure 6 I show some pics of the final release.

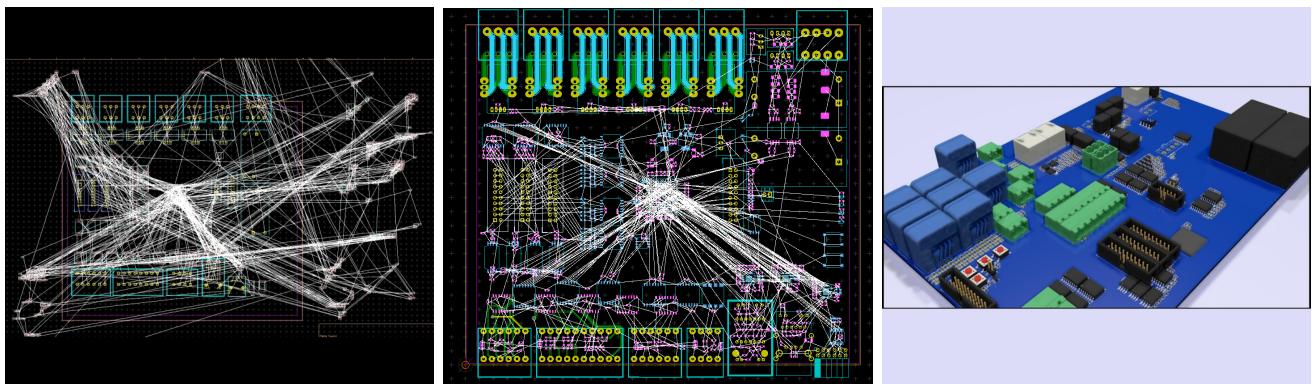


figure 5: PCB design stages at Nanocut Moldova for a PMSM servo drive.

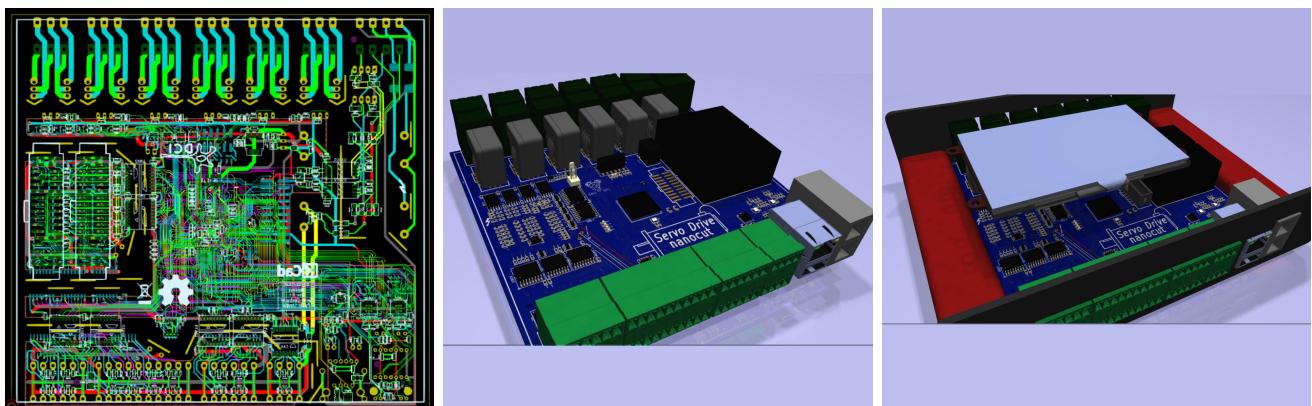


figure 6: PCB design release with a preliminary case at Nanocut Moldova for a PMSM servo drive.

In the figure 7 I show some pics of the mounted board.

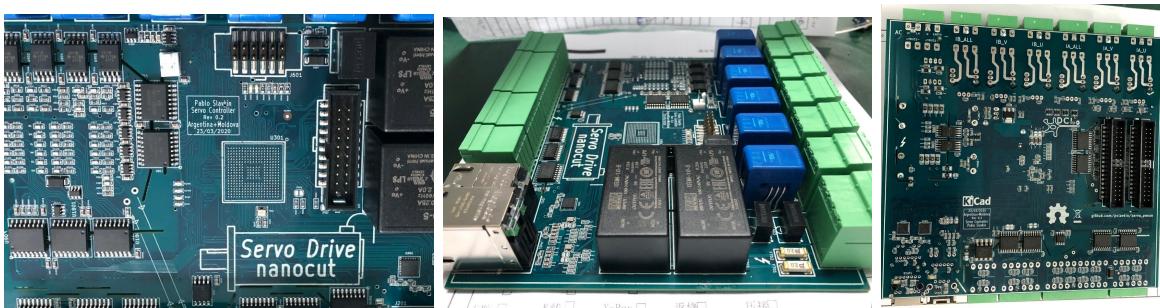


figure 7: Manufactured and mounted board in OurPCB factory for the PMSM servo drive.

Wolfcut

I've developed a HTML/WIFI remote control for a NK105 based CNC machine for Wolfcut.

I've used a Beagle Bone Green Wireless embedded computer that behaves as an USB mass storage for file exchange eliminating the need of connecting and disconnecting a pendrive.

I've design a small Beagle break board that connect in between the keyboard cable and emulate the actual keyboard. I've compiled the GCC for the ARM using crosstool-ng, then compile the linux kernel using the GCC generated, a custom file system using buildroot.

I've used the new style configFS to emulate the mass storage profile, and configured an apache deamon for the web GUI and php support for the backend interacion with a C code that do the actual communication with the NK105. Figura 8 shows the implemented layer model and some captures of the web page.



figure 8: Software layer model and the web page designed to remote control the NK105 CNC controller through WIFI.

Figure 9 shows some captures of the compilation setup in action.

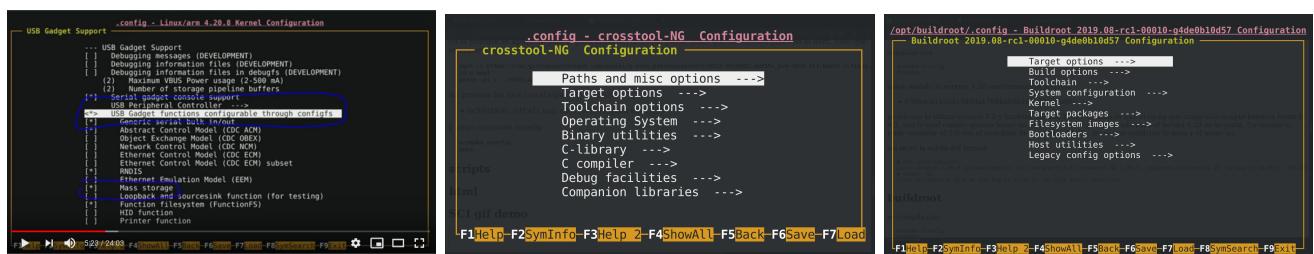


figure 9: crosstool-ng, kernel and buildroot setup, used in the wifi remote control of NK105

Noto Group S.A.

As a technological partner of Noto Group S.A I've developed and manufactured electronic equipment for electromedicine aesthetics among which stand out:

- Tripolar radiofrequency.

- Electroporador.
- microdermabrasion.
- Cavitator.
- Light therapy.
- Portable electrostimulator.
- Medical certified power supplies.

The figures 10, 11 y 12 shown some of the equipments:



figure 10: Power equipments, power supplies, oscilators, TH and SMD mounting techniques

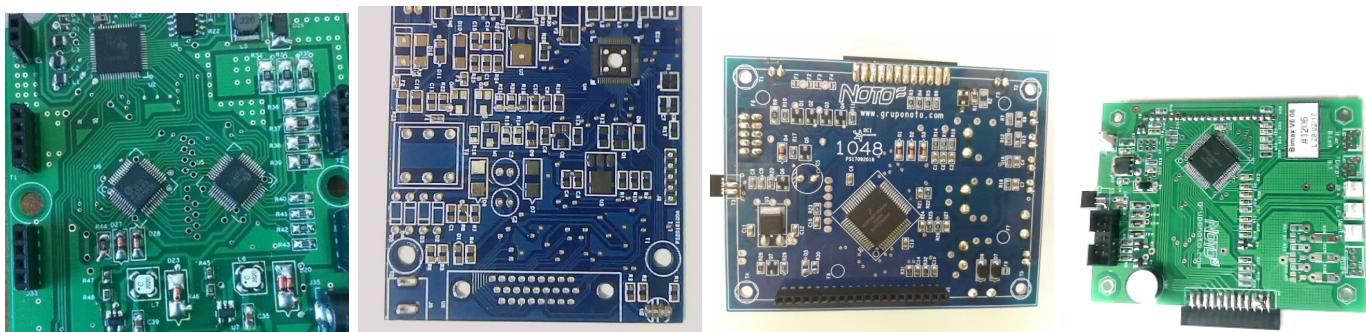


figure 11: Controller boards, LCD controllers, PWM drivers, signal generators, TH y SMD 1206, 0805 y 0603 technologies used.



figure 12: Some electronics equipment developed and manufactured for Noto Group.

Master's degree in Embedded Systems

During the MSE I've developed a lot of hardware, firmware, software and management project, and the following stand out:

- Python + sockets + threads + json + OOP

During the subject *General purposed operative system application deployment* I've code a Python program to send currency exchange through UDP using sockets, threads and json. You'd see my public [repository](#) in this [link](#) and enjoy a simple demo following asciinema link in the figure 13

CNC Machine controller

```
[root@master ~]# ./doc.md
[100%]
lo que hace el programa es lanzar 3 threads cada una asociada a un puerto coincidente con el
service. 10000, 10001 y 10002
el programa lee 3 config diferentes config0.txt 1 y 2 en donde se redireccionan a 3 sv
diferentes tambien
por eso el servicio muestra una salida. ■

[100%]
mar_ 94 words < -100% : 18:39
-- INSERT --
tarea 0 goodAck<#2 badAck<#0
tarea 0 goodAck<#3 badAck<#0
tarea 0 goodAck<#4 badAck<#0
tarea 0 goodAck<#31 badAck<#0
tarea 0 goodAck<#44 badAck<#0
tarea 1 goodAck<#23 badAck<#0
tarea 0 goodAck<#43 badAck<#0
tarea 2 goodAck<#16 badAck<#0
tarea 0 goodAck<#46 badAck<#0
tarea 0 goodAck<#47 badAck<#0
tarea 0 goodAck<#47 badAck<#0
tarea 0 goodAck<#17 badAck<#0
tarea 2 goodAck<#17 badAck<#0
tarea 1 goodAck<#25 badAck<#0
tarea 0 goodAck<#49 badAck<#0

[100%]
18:56:16.056380 IP localhost:10001 ->localhost:49885: UDP, length 2
18:56:17.019660 IP localhost:50267 ->localhost:10000: UDP, length 268
18:56:17.025588 IP localhost:10000 ->localhost:50267: UDP, length 2
18:56:18.026378 IP localhost:50267 ->localhost:10000: UDP, length 268
18:56:18.799385 IP localhost:56868 ->localhost:10002: UDP, length 274
18:56:19.051244 IP localhost:10002 ->localhost:56868: UDP, length 274
18:56:19.457991 IP localhost:10001 ->localhost:49885: UDP, length 272
18:56:19.861429 IP localhost:10001 ->localhost:49885: UDP, length 2
18:56:19.933496 IP localhost:50267 ->localhost:10000: UDP, length 268
18:56:19.940879 IP localhost:10000 ->localhost:50267: UDP, length 2
18:56:20.041176 IP localhost:50267 ->localhost:10000: UDP, length 268
18:56:20.647262 IP localhost:10000 ->localhost:50267: UDP, length 268
18:56:20.720887 IP localhost:10001 ->localhost:49885: UDP, length 272
18:56:21.048079 IP localhost:50267 ->localhost:10000: UDP, length 268
18:56:21.048079 IP localhost:10000 ->localhost:50267: UDP, length 268
18:56:21.876266 IP localhost:56868 ->localhost:10002: UDP, length 274
18:56:21.813718 IP localhost:10002 ->localhost:56868: UDP, length 2
18:56:22.061527 IP localhost:50267 ->localhost:10000: UDP, length 268
18:56:22.061527 IP localhost:10000 ->localhost:50267: UDP, length 268
18:56:22.073941 IP localhost:49885 ->localhost:10001: UDP, length 272
18:56:22.882534 IP localhost:10001 ->localhost:49885: UDP, length 2
18:56:23.062573 IP localhost:50267 ->localhost:10000: UDP, length 268
18:56:24.076319 IP localhost:50267 ->localhost:10000: UDP, length 268
18:56:24.076941 IP localhost:10000 ->localhost:50267: UDP, length 268
18:56:24.077953 IP localhost:50267 ->localhost:10002: UDP, length 274
18:56:24.077953 IP localhost:10002 ->localhost:56868: UDP, length 274
18:56:24.078104 IP localhost:56868 ->localhost:10001: UDP, length 274
18:56:24.078104 IP localhost:10001 ->localhost:49885: UDP, length 272
18:56:24.883451 IP localhost:49885 ->localhost:10001: UDP, length 272
18:56:24.891174 IP localhost:10001 ->localhost:49885: UDP, length 2
18:56:25.077924 IP localhost:50267 ->localhost:10000: UDP, length 268
18:56:25.077924 IP localhost:10000 ->localhost:50267: UDP, length 2
18:56:25.084107 IP localhost:10000 ->localhost:50267: UDP, length 2

[100%]
MONEDA COMPRO VENTA MONEDA COMPRO VENTA MONEDA COMPRO VENTA
Dolar: 58.63 61.61 Dolar: 58.63 61.61 Dolar: 58.63 61.61
Euro: 65.12 68.93 Euro: 65.12 68.93 Euro: 65.12 68.93
Real: 13.45 14.23 Real: 13.45 14.23 Real: 13.45 14.23
Ieu: 22.45 22.23 Yenes: 122.45 122.23 Austr: 1260.45 1260.23
```

figure 13: Python development using socket, threads, json and cvs during a master's degree subject

As a final project for the CESE (Embedded system specialization), I've designed a complete 3 axis CNC machine controller including the firmware for the real time task and Ethernet communication on a cortex M4F, the stepper motor drives and a software for PC to send the GCode files and show the actual position of the machine on real time. The machine could be managed over the internet or run completely alone using the embedded controller.

The pictures of my actual implementation are shown in the figure 14 and I've upload some videos of the running machine cutting a piece of wood in the following link [videos pap](#). On the videos list you will find my public defense of the work at the UBA university.

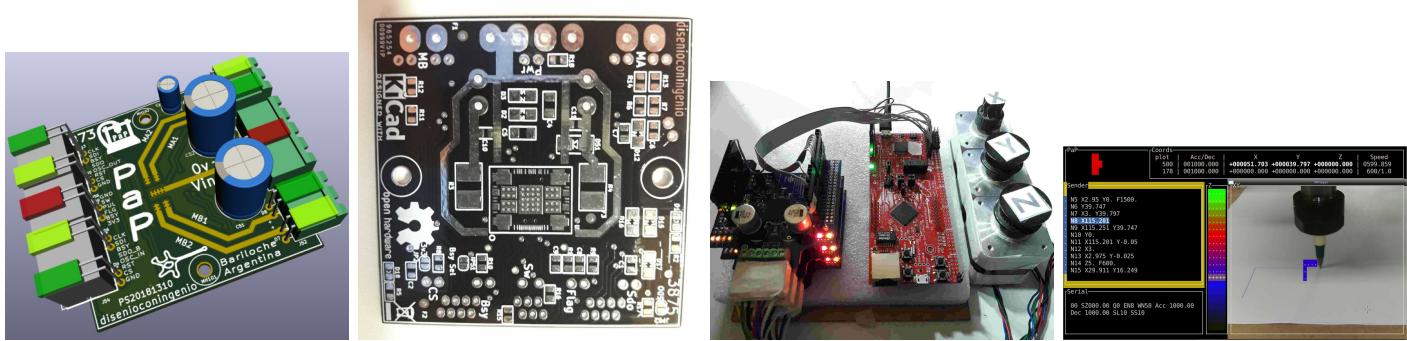


figure 14: CNC machine system. Hardware, firmware and software developed as my final project for the CESE career.

diseñoconingenio

When I was in charge of Disenioconingenio, I developed several products for sale in the market and customized according to the characteristics required by the customers, the following stand out:

- #### ○ RFID 125Khz Multiprotocol

A 125khz RFID card reader was designed with a discrete frontend and fully decoded by the microcontroller. This allows reading data from different manufacturers and different protocols, and combining with multiple data outputs, such as RS232, RS485, Wiegand and ABA.

There are shown some pictures in the figure 15.

- Hango - Wheel chair motorizer

In conjunction with institutions dedicated to assisting people with mobility difficulties such as CIAPAT, AEDIN and FAME, we develop Hango.

It consists of a motorizer that attaches to manually driven wheelchairs granting comfort and independence.

Models for children and adults up to 100kg were developed with different styles of commands, some based on the



figure 15: 125khz RFID multiplrotol card reader, compatible with most card manufacturers.

typical joystick, and other new ones using touch screen technology.

The equipment adapts to the vast majority of market chairs with minimal mechanical intervention and allows the coupling and uncoupling without tools, suitable for transfers by car and plane.

Thrre are some pictures in the figure 16 and 17 and also some videos at [Videos Hango](#).

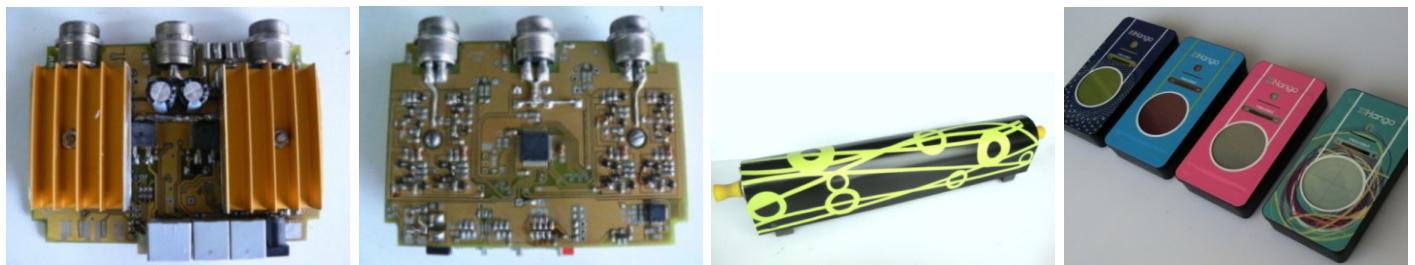


figure 16: Hango Power boards, controller and joysticks.



figure 17: Hango parts, and Hango at the CIAPAT expo.

National Atomic Energy Commission

I worked at the CNEA as a research fellow in the PET (Positron Emission Tomography) development group. During the work period, a CNC machine was developed for automatic movement of radioactive material. I also code part of the photon coincidence algoritm in VHDL for the FPGA shown in the figure 18.

Then I developed the software for acquisition and analysis of raw data from the equipment shown in the figure 19.

Seconsat

In addition to consulting tasks, a wireless device was developed to report temperature, humidity, speed, and other parameters from the box of a cargo truck to a GSM tracking equipment.

I've used 0402 technology in a 4-layer PCB with radiofrequency requirements from 200 MHz to 2.4 GHz.

I've developed the schematic, and the PCB in Orcad Allegro as shown in the figure 20.

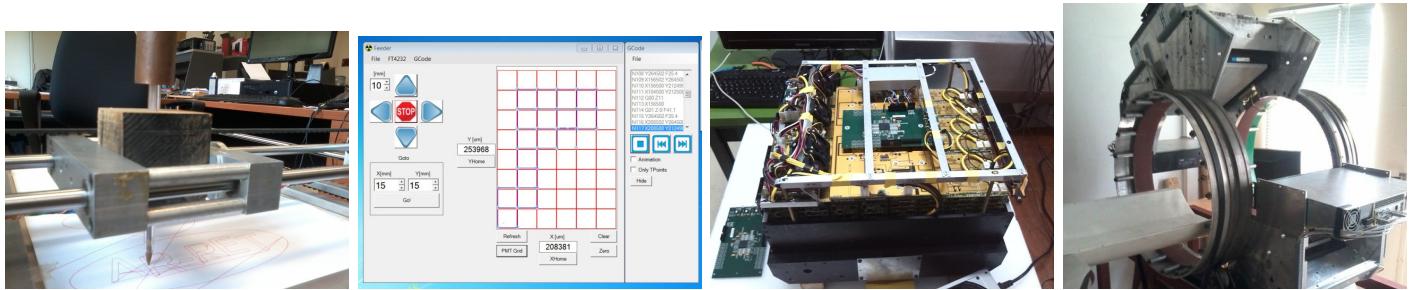


figure 18: CNC table for automation of acquisitions with a capture of the management software, the board with the FPGA mounted in one of the 6 heads, and the half-finished tomograph.



figure 19: Captures of acquisition software, CUIPET, of the PET at CNEA's lab.

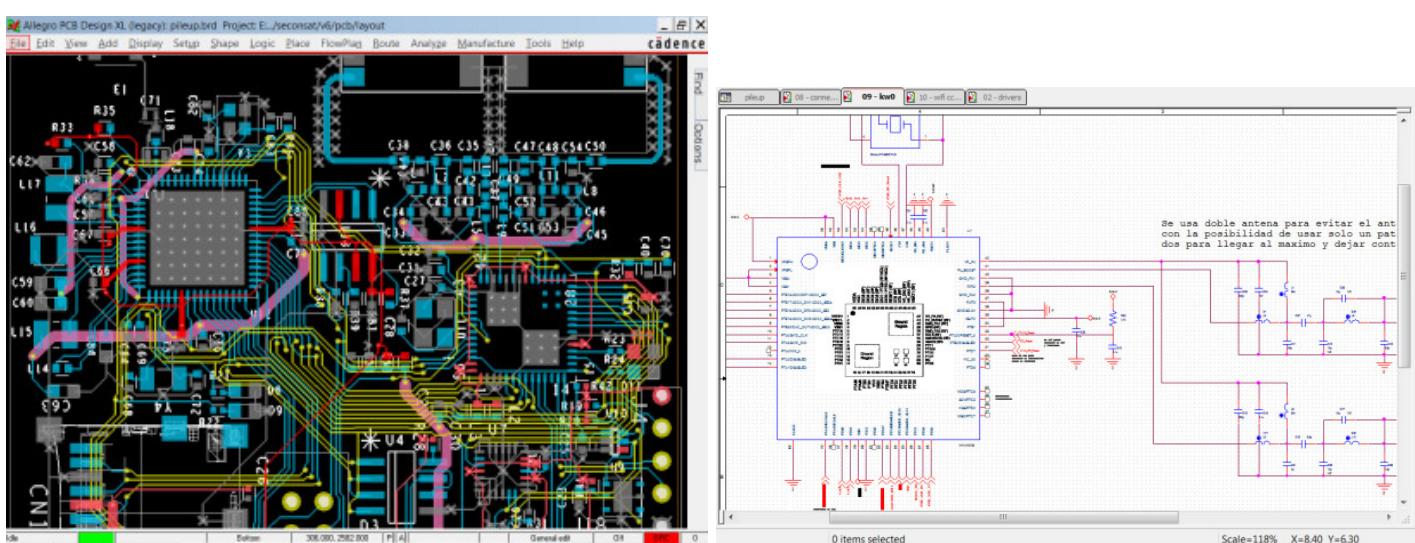


figure 20: PCB development using one 2.4Ghz and one sub-1Ghz radio for wireless communication.

Xenon S.A.

I've worked for Xenon S.A as a developer and manufacturer of electronic equipment for cinemas automation. The equipment is controlled by a RS232 channel using a custom protocol based on MODBUS. Models are manufactured with different performance, sizes and cabinets as shown in figure 21.



figure 21: Cinema automation equipment for Xenon S.A. using RS232 channel and customized communication protocol.

Pointer

I've worked for Pointer as a consultant engineer, firmware and hardware developer in the vehicle tracking sector. I've made some products among those that stand out:

- 3D printed lighted keyboard.
- LCD touch keyboard access control.

Figure 22 shows some of the equipments developed and manufactured:

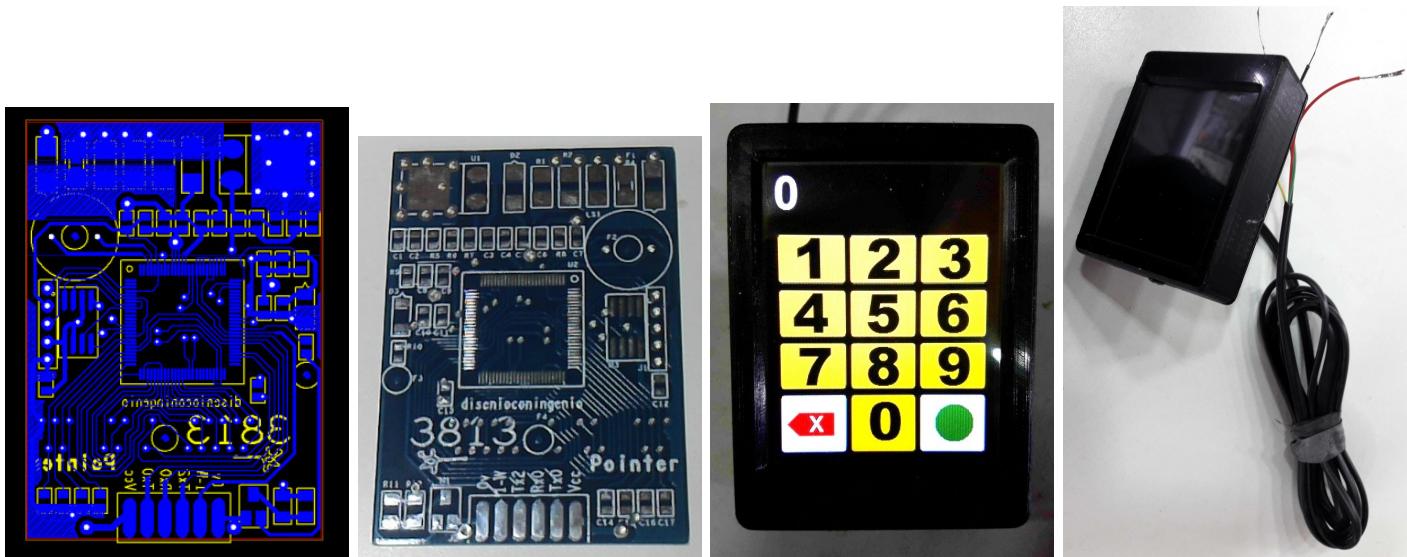


figure 22: LCD touch keyboard as a truck driver access control.

Piscina Natural

I've worked for Piscina Natural, as a consultant engineer, developer and manufacturer making products related to swimming pools electronic cleaner.

I've developed a product in charge of control and measure the electrical current driving carbon cells that made chlorine using electrolysis over saline water.

The design an equipment manufactured are currently running all over the country.

Figure 23 shows some pics of the controller.

La Colmena

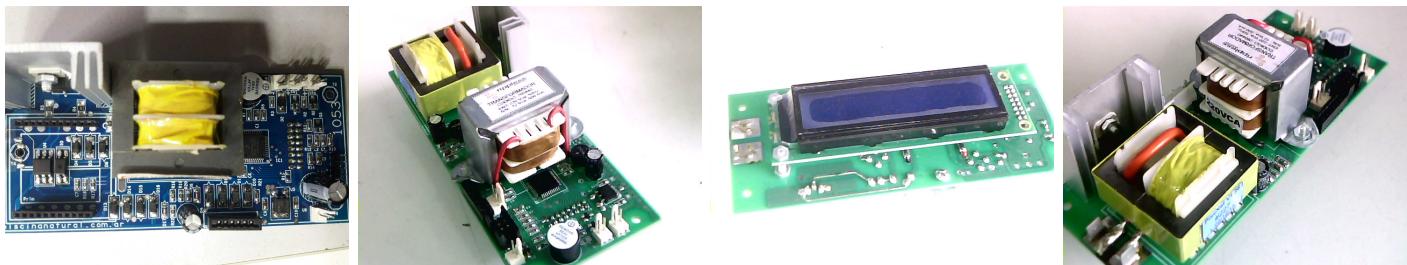


figure 23: Electrolysis of saline water electronically controlled for automated swimming pool cleaner for Piscina Natural

For the well-known disc of Pilar, La Colmena, a LED ceiling was developed and manufactured using Ethernet with the sophisticated software Madrix, highlighting the photos of the installation in the figure 24 and there are also some public videos on [videos La Colmena](#).



figure 24: LED display mounted on the roof of the La Colmena disc, developed, manufactured and installed.

From this work, a product that consists of interconnected modules to form LED screens different pitch and sizes. Can you see in the pictures of the figure 25 and you can see some videos at [see videos](#).



figure 25: Modules of interconnectable LEDs to form LED screens controlled by ethernet of different pitch and sizes.

Grupo Koner

I've worked for Grupo Koner as a consultant engineer, developer and manufacturer of products related to access control. I've developed from scratch a fully customized RFID reader to communicate with a GSM tracker and report the truck driver remotely and also have some alarm functions.

I've made also a wireless panic button integrated with the actual design.

Digicard S.A.

For several years, I work for the company in the area of development of new hardware products aimed at access control. I can highlight the development of a new RFID reader of 125khz to replace the old magnetic cards readers and provide customized solutions integrated with the rest of the access control system of the company. I did the requirements,

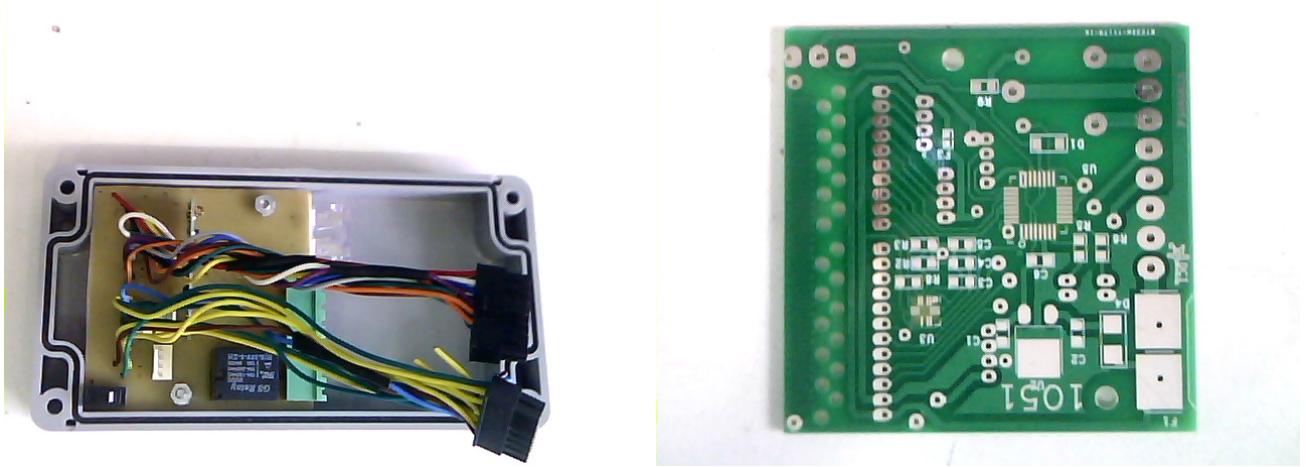


figure 26: Wireless equipment connecting the AVL equipment at Grupo Koner

schematic design, PCB design, prototype, documentation for production, commissioning and documentation of use. The reader is still produced and using currently. Some photos of the equipment can be seen in figure 27.

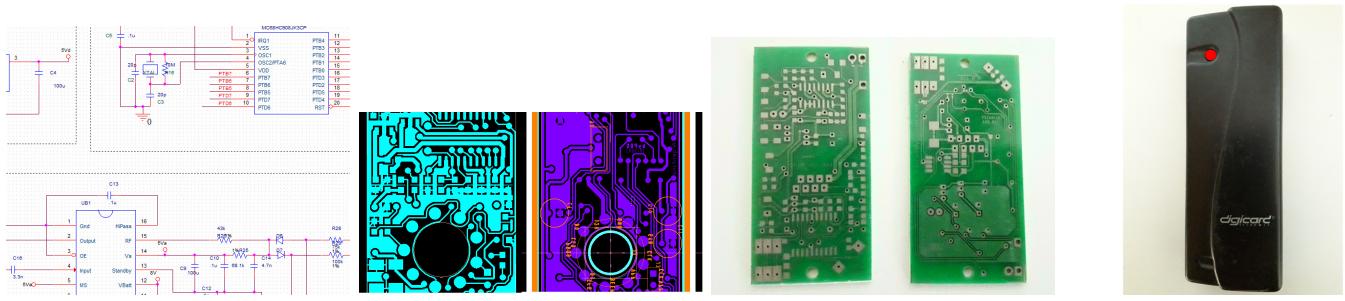


figure 27: Development of hardware, firmware and production of RFID reader of 125khz for the company Digicard.

Softron

La empresa Softron S.A provee soluciones al mercado mayorista de proveedores de energia, instalando medidores de consumo y ofreciendo el servicio de monitoreo remoto.

Para dicha empresa se desarrollaron placas de integracion entre SBC, computadoras en una placa, y perifericos como, salidas de rele, entradas IO's, fuentes de alimentacion, soporte para modulo GSM y dual SIM, entre otras opciones. Se pueden ver algunas fotos de la placa desarrollada en la figura 28 para la cual se realizaron varios prototipos y se genero toda la documentacion de fabricacion en volumen.

Por otra parte tambien se disenaron dispositivos inalambricos para monitoreo de temperatura usando redes Zigbee en modo mesh, se pueden ver algunas fotos de los equipos fabricados en la figura ??.

Títulos

Se muestran en la figura 29 los titulos y certificados relacionados a la carrera de grado.

En la figura 30 se muestran certificados de diversas actividades realizadas de manera independiente.

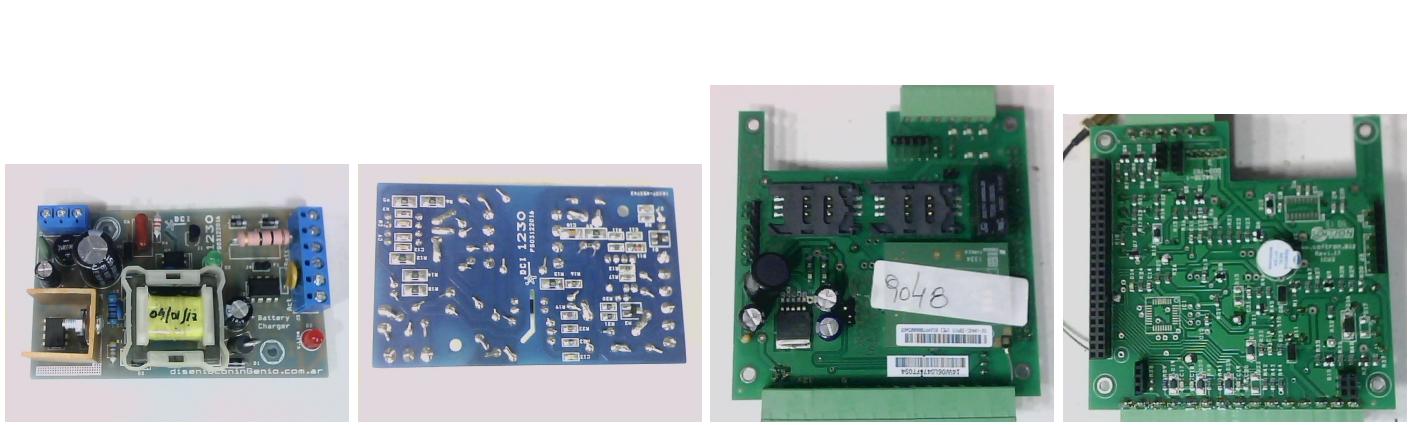
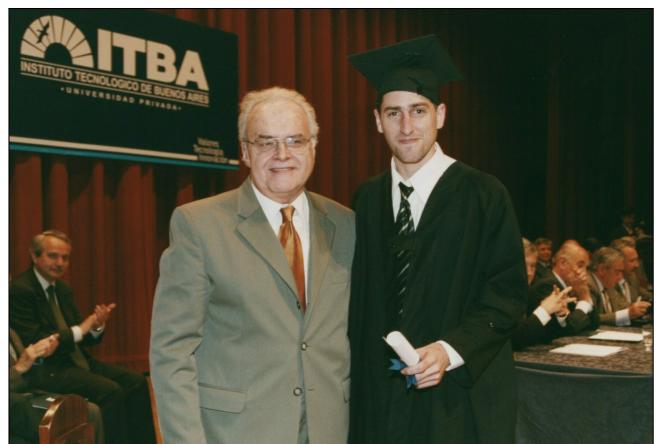


figure 28: Placa de integracion entre una SBC y una amplia gama de perifericos, modulo GSM, fuente de alimentacion y conectores.



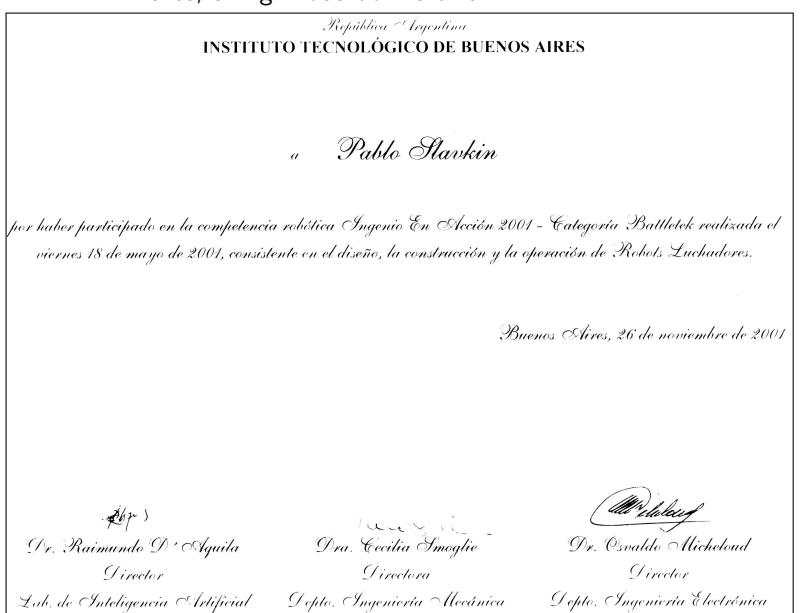
(a) Título de Ingeniero Electrónico con especialidad en Telecomunicaciones del ITBA.



(b) Foto de entrega de título junto con mi profesor y referente, el Ing. Eduardo Martinez.



(c) Medalla al primer puesto en I+D, iniciación en investigación y desarrollo, del ITBA



(d) Certificado de participación en Batletek, competencia de lucha de robots en el ITBA, en donde se obtuvo el tercer puesto.

figure 29: Títulos y certificados obtenidos durante la carrera de grado en el ITBA.



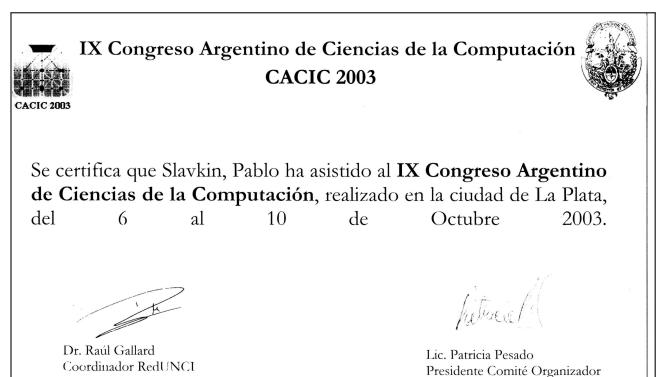
(e) Informe en diario Clarín sobre la competencia de robots de lucha en la que se participó.



(f) Certificado de participación en el curso de Inteligencia Artificial.



(g) JAIIO, 32º Jornadas Argentinas de Informática e Investigación Aplicada. Se presento el trabajo *Design and Simulation of a pipeline-structured Floating Point Unit for high performance general purpose processors*. ver trabajo



(h) CACIC, IX Congreso Argentino de Ciencias de la Computación en donde se presento el trabajo *Selection of the Optimum Stage Number in Pipelined Floating-Point Units* ver trabajo

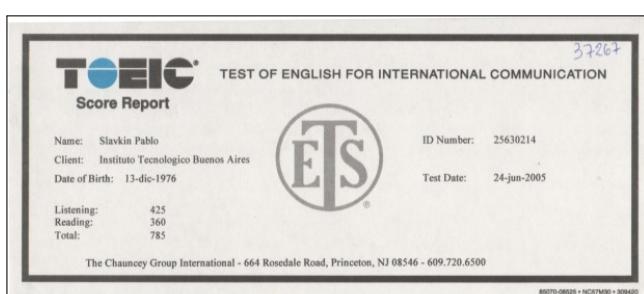
figure 29: Títulos y certificados obtenidos durante la carrera de grado en el ITBA.



(a) Introducción a Latex. Se tomó el curso de introducción a latex como herramienta para la presentación de trabajos científicos y documentos en general. Se continuó luego de manera autodidacta y se la utiliza frecuentemente para la documentación, presentaciones, papers, etc. [Ver certificado](#)



(b) Certificado por el dictado de un curso a escuela secundaria de introducción a la robótica, teórica y práctica. [Ver certificado](#)



(c) Certificado de examen de inglés TOEIC. [Ver certificado](#)

(d) Diploma de participación en el concurso de proyectos LATAM 2018 organizado entre el MIT y el ITBA. [Ver certificado](#)

figure 30: Certificados obtenidos en diferentes cursos y seminarios participando de manera independiente como parte de la actualización personal técnica y académica.