DANIEL FERNÁNDEZ CUENCA (25/9/1978)

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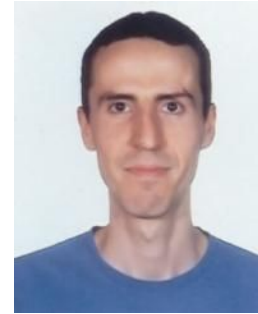
I live in Barcelona city, Spain. but I will be living in London from 14th January 2020 at the address above.

ACADEMIC STUDIES

Sept 1997 - June 2007 Telecommunications Engineer (five year programme) with an emphasis in communications. at ETSETB (UPC) (Universitat Politècnica de Catalunya, Spain) **degree title obtained on 2016**.

PROFESSIONAL EXPERIENCE

Sept. 2017 - Mar. 2019 Research engineer at ICFO - The Institute of Photonic

Sciences

Group leader: Turgut Durduran, Professor.
Former member of the medical optics research group, working for the LUCA European project. Acquainted with a photonics lab working environment and using off-the-shelf optical components from Thorlabs. Simulation and implementation of optical intensity autocorrelation in FPGA for blood flow measurements using NIRS DCS technique. Correlator synchronization using board stacking. Increase number of detector channels from 4 to 16. Design and implementation of new autocorrelator architecture with high density number of channels 64. Participation in Llavor project helping in the design of a portable (SCOS) Speckle Contrast Device. PCB routing in Altium. FPGA Xilinx Kintex7 devices and Vivado IDE. Using Enclustra industrial FPGA boards and Trenz Electronic. Source control using git and gitlab. Documentation, testing and validation of the correlators. Conference abstract and poster session accepted for SPIE ECBO 2019 in Munich as principal author. Participation in the design of a class 3b (30 mW) NIR 780 nm laser for biomedical applications consisting of a laser driver with constant current mode and a TEC/NTC PID controller for temperature stabilization. Measure of the coherence length of a laser beam using a Fabry-Perot interferometer with piezo tuning.

March 2015 - October 2016 FPGA and RTL coder at Final Engineer Degree Project at Optical Communications Group of TSC dept. UPC.

Title's final project degree FPGA implementation of a Nyquist pulse transmitter

Supervisor: José Antonio Lázaro Villa, Associate Professor

FPGA 31.25 Mbaud, baseband modem for fiber optics communications (except channel equalizer only in electrical domain) using multirate techniques. Transmitter architecture research and MATLAB simulation of DSP algorithms using efficient polyphase/multirate

techniques. Conversion from double floating point to fixed-point computations for integer arithmetic implementation. Symbol modulation and pulse shaping using polyphase multirate filters. PRBS using LFSR circuits. Research on baseline DC wander effect on PAM modulation. Transmitter VHDL coding and simulación in Modelsim-Altera simulator. Implementation using FPGA Terasic Cyclone V Starter development board and DAC/ADC Terasic THDB-ADA conversion board. Real-time testing and lab performance measurement. Receiver's architecture research, synchronization theory study. research on theory and suitable architectures for joint matched filter detection, synchronization control loops and AGC. MATLAB simulation of the symbol synchronizer and design and simulation of fixed-point AGC. VHDL coding of the symbol synchronizer and VHDL coding of AGC, HDL simulation with Modelsim-Altera. Real-time lab testing of transmitter receiver chain.

Dic 2012 - Oct 2014 FPGA and RTL coder (VHDL) at EE dept., ETSETB UPC.

FPGA Implementation of an auditory filterbank modeling the human cochlea in fixed-point arithmetic. Search and documentation of suitable fixed-point filter bank structure which matches human auditory system. Fixed-point algorithm simulation in MATLAB. RTL coding of the auditory filter bank in VHDL. Logic simulation in ModelSim/Questa. Synthesis for Xilinx Kintex7 devices using the Xilinx KC705 evaluation board running at 200 Mhz. Real time testing with ChipScope and with lab instrumentation. IP core configuration of 1 Gbps Ethernet IP Core and RTL coding of a packet TX generator for a spiking neuronal multiprocessor.

Nov 2011 - Feb 2012 Microwave designer at RSLAB (Microwave Lab), TSC dept., ETSETB UPC.

Design of ia frequency generator for a SAR radar in the Ku (17.5 Ghz) band based on DDS. Full transmisión chain design upto to the transmitter antenna. Microwave microstrip filter design @ 8 Ghz in ADS (circuital and layout) and Momentum (FEM). Filter PCB fabrication using laser photoplotter and chemical developing techniques. Design and fabrication of a frequency multiplier using Hittite MMIC. Testing of IF whole chain at 1 GHz. CW chirp signal implementation using the DDS AD9910. Testing AD9910 eval board. DDS register programming with Arduino. Radar testing and target testing in an anechoic chamber using FFT algorithm (offline in MATLAB). DDS schematic entry and PCB routing in Altium. PIC microcontroller programming using the SPI protocol to program DDS registers. Another PCB design and routing for UAV plane. Aluminium box machining using 3D CAD software for NC milling machine. Intensive use of lab test and measure equipment like R&S, Agilent and HP.

Feb 2008 - Jan 2009 Simulation of high-rate random like turbo-codes for multimedia watermarking, UPC (ETSETB) Telematics Engineering dept.

MATLAB simulation of high-rate random turbo codes. Coding of a flexible software to allow selecting between parallel or serial concatenated convolutional codes and various types of interleaving and puncturing. Conversion to lattice codes through DCT transform.

Implementation of several collusion attacks with random subsets of colluders and AWGN noise. Software implementation of soft (euclidean) list-viterbi decoding algorithm. Random generation of valid generation matrices for convolutional codes. Processing the decoding lists to find the most likely colluders (traitor) and computing the probability metrics like probability of detection and false alarm. BASH shell scripting to perform unattended high load, high memory and long time simulation (1 month 24/7) of random convolutional codes in a computing server. Succeed in reproducing results published in the literature.

KNOWLEDGE BACKGROUND

I took university courses from a very broad range of topics. Coding theory, acoustics, optical engineering, Analog and digital TV, Video coding and image processing and laser propagation through atmospheric turbulence. Also I've taken various EE courses like control theory, physics of semiconductor devices and digital design.

COMPUTER LANGUAGES

C, C++, Java, Python, TCL, Perl, PHP, MySQL, Html, Javascript, MATLAB, LaTeX.

COMMUNICATION LANGUAGES

I'm in the process of obtaining an IELTS grade. I have a good understanding of English language and I want to improve my speaking skills living in UK.

OTHER LABOUR EXPERIENCE

Working part time in various non-qualifying jobs while attending academic lectures between 2000 and 2008 as call center receiver staff, assembler of electronic components, etc.

OTHER ACADEMIC STUDIES (non-completed)

2012 Electronic engineering at Universitat Politècnica de Catalunya (UPC), ETSETB
2017 MSc. Electronic engineering at Universitat Politècnica de Catalunya (UPC), ETSETB

OTHER DATA

Radioamateur, call sign EB3FBD.

Ex-member of ARU (UPC's UniversityAamateur Radio Club).