



Pierpaolo Granello

ABOUT ME

As a musician, since I was younger, I wanted to learn how to build audio devices by myself, which led me to be interested in both digital and analog electronics worlds. In my spare time I practice sports and I am a photography enthusiast. I had the great opportunity to build and continuously improving the reality of a recording studio (Studio Miriam), giving me the opportunity to continuously gain professional and work experience.

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING C1 READING C2 WRITING C1

SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

DIGITAL SKILLS

Altium Designer | PSpice | PLECS | Matlab | Virtuoso | Solidworks | Vivado | ModelSim | LabVIEW | MPLABX | TexStudio | C / ASM / VHDL / Bash

EDUCATION AND TRAINING

[10/2020 – Current]

Ph.D Candidate

Delft University of Technology

Address: Netherlands

Field(s) of study: DC Systems, Energy Conversion and Storage of Delft University of Technology

[11/2021 – Current]

Ph.D Candidate

Sapienza, University of Rome

Address: Italy

Field(s) of study: Astronautical, Electrical and Energetic Engineering

[23/01/2020]

Master's Degree

Sapienza, University of Rome

Field(s) of study: Electronic Engineering

Final grade: 110/110

Thesis: Conversion and Distribution Module for Microsatellite

Manufacturing and test phases of the Engineering Model of a Power Module to be used in a microsatellite application. PCBs prototyping, Latching Current Limiter design. DC/DC Converter with input/output filter design for PV to BESS interfacing. Thermal and mechanical design on 3D CAD.

WORK EXPERIENCE

[06/2020 – 10/2020]

System Engineer / Hardware Design Engineer

Thales Alenia Space - Rome

Country: Italy

Power Conversion and Distribution unit design. Mixed signals electronic designer for telecommunication applications.

[12/2016 – Current]

Co-Founder and Co-Manager - Electronic Engineering Designer

Studio Miriam - Recording Studio

Country: Italy

Audio electronic products design and maintenance, commercial and managing

[01/07/2019 – 30/06/2020]

Research Fellowship

Sapienza, University of Rome

Country: Italy

Microsatellite PCDU Design, Prototyping and Test. Also design, developing, testing and integration of a PCDU module for AstroBioCubeSat project, VEGA-C maiden flight, for assessing radiation tolerances of a STM MCU and of a Hemispherical Resonator Gyro.

HONOURS AND AWARDS

[05/2017]

LabVIEW Associate Developer Certification Awarding institution: National Instruments Customer Education

Successfully completed all requirements and granted the title of LabView Certified Associate Developer, S/N 100-317-19323

PUBLICATIONS

[2023]

The power diode

Reference: DOI: 10.1016/b978-0-12-821204-2.00161-6 / Part of ISBN: 9780128232118
Book Chapter - Encyclopedia of Electrical and Electronic Power Engineering

[2022]

Revisiting the Partial Power Processing Concept: Case Study of a 5-kW 99.11% Efficient Flyback Converter-Based Battery Charger

Reference: DOI: 10.1109/TTE.2022.3170286

Journal Article - IEEE Transactions on Transportation Electrification

[2022]

A New Input-Parallel-Output-Series Three-Phase Hybrid Rectifier for Heavy-Duty Electric Vehicle Chargers

Reference: DOI: 10.1109/iecon49645.2022.9968988

Conference Paper - IECON 2022 – 48th Annual Conference of the IEEE

[2022]

12-pulse Rectifier with DC-Side Buck Converter for Electric Vehicle Fast Charging

Reference: DOI: 10.1109/iecon49645.2022.9968872

Conference Paper - IECON 2022 – 48th Annual Conference of the IEEE

[2022]

Highly Compact Partial Power Converter for a Highly Efficient PV-BESS Stacked Generation System

Reference: DOI: 10.1109/smart55236.2022.9990160

Conference Paper - Mobility Applications, Renewables and Technology (SMART)

[2022] **Highly Efficient Capacitive Galvanic Isolation for EV Charging Stations**

Reference: DOI: 10.1109/speedam53979.2022.9842217

Conference Paper - International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM)

[2021]

Power Bus Management Techniques for Space Missions in Low Earth Orbit Energies

Reference: DOI: 10.3390/en14237932

Journal Article - MDPI Application of Innovative Power Electronic Technologies

[2020] **AstroBio cubesat: A nanosatellite for astrobiology experiments in space**

[2020]

Payload for assessing aging of electronic components under high flux radiation in the Van Allen Belts.

[2019]

POWER CONVERSION AND DISTRIBUTION MODULE FOR SATELLITE IN THE 500-2000W RANGE

PROJECTS

[11/2019] **AstroBioCubeSat, Sapienza Fellowship Project - ASI - Thales Alenia Space**

Write here the description...A CubeSat technological payload to be launched with the VEGA-C maiden flight for assessing radiation tolerance of a STM SPC56EL70L5T MCU and of a Northrop Grumman's Hemispherical Resonator Gyro. PCB design and test phases with Rad-Hard components. Design of the 3.3V latching current limiter with current telemetry using Rad-Hard BJT.

[02/2019] **Microsatellite PCDU, Sapienza Fellowship Project - Thales Alenia Space**

Design, manufacturing and test phases of the power converters, power distributions and analog interfaces of the Engineering Model for a microsatellite PCDU as a continuation of the master thesis work.

[06/2018] **Tunable Active Band Pass/Cut Filter, Master's Project**

A digitally controlled analog active filter which presents a fixed gain upon Q or w_0 variations has been designed in order to be implemented in a proposed structural model for a reverse filter: theoretical mathematical (MatLab) and simulation (PSpice) results lead to a band cut filter which presents 0 dB gain at the resonance and the requested gain outside the cutting band.

[03/2018] **Low Voltage OPA MOS 40 nm, Master's Project**

Design of a fully differential Low Voltage OPA in order to study how 40 nm MOSFET mismatches affect the CMFB performance. The OPA is powered with 260 μ A at 1.2 V. It has a bandwidth of 351 MHz (with 500 fF load), a differential gain of 67 dB, a minimum CMRR of 63 dB and a phase margin of 83.5°. A composite CMFB circuit has been specially designed in order to linearize its otherwise irregular transcharacteristic due to the minimum power parameters. The small signal performances were then verified when the process parameters changed. Through the montecarlo analysis the performances were

studied in presence of process mismatches that particularly affect the differential cells. Finally, a layout was created on Cadence Virtuoso, which, after the parasitic extraction, was compared with the performance of the ideal circuit.

[03/2018] **VHDL code synthesizing two-cycles memory interfaces, Master's Project**

VHDL code for both standard CMOS cells SRAM Data and Program two-cycles memory interfaces of the Klessydra Core for FPGA implementation on a Xilinx Zedboard. A benchmark code was written for both memories and the complete interface architecture. Once the designed structure was connected to the core, the core boot was successful.

[12/2017]

Switching + Linear PSU with over-current/voltage/temperature protections, Studio Miriam

Design and manufacturing of a switching + linear power supply with protections (24V-10A and 48V-1A).

[03/2018] **Low Noise High Gain Microphone/Line Preamplifier, Studio Miriam**

Design and manufacturing of a low noise and high dynamic microphone and line preamplifier.

[04/2018] **VHDL Pinball VGA Game on FPGA, Master's Project**

The classic Pinball game has been implemented through a VHDL code on the Digilent ZYBO FPGA board, with a color video port (VGA) resolution of 640x480 pixels, and interactions through the on board control buttons.

[05/2018] **Dorothy, Autonomous Indoor LiDAR Car, Master's Project**

Development of an autonomous indoor vehicle based on generic specifications provided by a hypothetical customer. The development of user requirements, system and component Specifications, led to the final validation following the prototype manufacturing and programming. Vehicle movements and LiDAR angle are driven through PWM signals.