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Leonardo Gasparini

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Fondazione Bruno Kessler, via Sommarive 18 - Povo, 38123, Trento, Italy

WORK EXPERIENCE

03/08/2010 – CURRENT – Trento, Italy

RESEARCH ENGINEER – FONDAZIONE BRUNO KESSLER / CENTER FOR SENSORS & DEVICES

Research and Development in the field of CMOS image sensors with emphasis on arrays of time-resolved single-photon avalanche diodes for scientific, industrial, automotive and space applications.
Head of the Integrated Radiation and Image Sensors (IRIS) research unit since November 1st, 2021.

Trento, Italy

2007 – 2017

TEACHING ASSISTANT – UNIVERSITY OF TRENTO

Courses: "Electronics of Digital Systems", "Adaptive Electronic Systems", "Electronic Instrumentation for Measurements"

Trento, Italy

16/06/2017 – 27/10/2017

VISITING RESEARCHER – INSTITUTE OF APPLIED PHYSICS, UNIVERSITY OF BERN

Development and characterization of a single photon detector module for quantum imaging applications

Bern, Switzerland

21/02/2011 – 29/02/2012

CONTRACT PROFESSOR – FREE UNIVERSITY OF BOLZANO/BOZEN

Instructor for the "Architecture of Digital Systems" course, B.Sc. in Computer Science and Engineering

Bolzano

EDUCATION AND TRAINING

01/11/2007 – 15/04/2011 – Trento, Italy

PH.D. IN INFORMATION AND COMMUNICATION TECHNOLOGIES, ELECTRONICS AREA – Dept. of Information Engineering and Computer Science, University of Trento

Thesis title: "Ultra-low-power Wireless Camera Networks - Design and Performance Analysis"
Advisor: Prof. Dario Petri

01/08/2008 – 31/07/2009 – Santa Cruz, CA, United States
VISITING SCHOLAR – Department of Computer Vision, University of California

Vision algorithms for ultra-low-power cameras

30/10/2004 – 23/03/2007 – Trento, Italy
M.SC. IN TELECOMMUNICATION ENGINEERING – University of Trento

Thesis title: "Generating High Accuracy Timing Signals for Time Driven Switching from GPS Receivers Using an FPGA Discrete Filter"
Advisors: Dr. Andrea Boni, Prof. Yoram Ofek
Final grade: 110/110

01/09/2001 – 29/10/2004 – Trento, Italy
B.SC. IN TELECOMMUNICATION ENGINEERING – University of Trento

Thesis title: Implementation and Optimization of Support Vector Machine on a 8-bit Microcontroller
Advisor: Dr. Andrea Boni
Final grade: 107/110

LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	B2	C1	C1	C1	C1
SPANISH	A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

LaTeX

Analog IC design

VLSI Design and Analog IC design | Cadence Virtuoso XL | IC Test and Experimental Evaluation

FPGA programming

FPGA design and verification | FPGA VHDL

Software programming

MATLAB | C | C++ | Python | labVIEW

PROJECTS

01/10/2020 – CURRENT
FastGhost - Fast quantum ghost microscopy in the mid-infrared (EU H2020 FET-OPEN)

Project goal: develop the technology for manipulating single photons and photon pairs to deliver a ground-breaking quantum imaging system for the mid-IR region targeting the medical sciences.
Main tasks: chip design, system development.

19/03/2019 – CURRENT
New Satellites Generation Components - Star Tracker (MIUR PON)

Project goal: design of a miniaturized star tracker based on a custom ASIC implementing a high-resolution active pixel sensor with on-chip processing.
Main tasks: FPGA system, firmware design, algorithm implementation.

08/08/2010 – CURRENT
R&D activities for external companies

Feasibility studies for a broad band of applications requiring custom imagers.
Main tasks: sensor and system modeling, architecture design, system development.

05/10/2017 – 31/12/2019
SBAM - SPAD-based acquisition readout for the MONDO experiment (collaboration with Centro Fermi)

Projec goal: development of a digital silicon photo-multiplier for the tacking of neutrons in hadrontherapy.
Main tasks: project leader, chip design, firmware design.

01/03/2016 – 31/10/2019
SUPERTWIN - All Solid-State Super-Twinning Photon Microscope (EU H2020 FET-OPEN)

Project goal: demonstration of a super-resolution quantum optical microscope based on correlated (entangled) photons.
Main tasks: WP leader, sensor design and test, functional characterization, system development.

01/09/2013 – 31/08/2016
SiQuro - On silicon chip quantum optics for quantum computing and secure communications (PAT "Grandi Progetti")

Project goal: bringing the quantum world into integrated photonics by using the silicon platform and, therefore, permitting in a natural way the integration of quantum photonics with electronics. More specifically, our unit designed an integrated quantum random number generator for cryptographic applications.
Main tasks: system modeling, sensor design, system integration.

01/09/2014 – 01/05/2016
MILA - Miniaturized Imaging Laser Altimeter (ESA)

Project goal: development of a compact imaging altimeter for the future ESA mission in order to provide a support for the global navigation system in the approach and landing of flying spacecrafts. More specifically, our unit designed a single-photon imager for space LiDAR applications.
Main tasks: system development, firmware design.

2010 – 2015

SPADnet - Fully Networked, Digital Components for Photonstarved Biomedical Imaging Systems (EU FP7 ICT)

EU FP7 project developing a digital silicon photo-multipliers for positron emission tomography.
Main tasks: modeling of the sensor, system development, functional characterization.

ORGANISATIONAL SKILLS

Organisational skills

Coordination: as part of my job, I prepare proposals for large European projects, coordinating the contributions from the partners in the consortium.
People management: as part of my job, I coordinate people in the design phase of an integrated circuit. I am tutor of a Ph.D. student. I do also operate as co-advisor of bachelor and master students who are working on their thesis in our laboratories.

COMMUNICATION AND INTERPERSONAL SKILLS

Communication and interpersonal skills

Team work: I am used to work in teams (mostly for IC designing and chip characterization), both as a team member and as a team leader. Communication in multi-cultural environment: I am used to work in a multi-cultural environment and collaborate with peers from all around the world.

JOB-RELATED SKILLS

Job-related skills

IC design, FPGA programming, software programming

OTHER SKILLS

Other skills

- programming and CAD: image processing, modeling of complex systems using Matlab and Simulink, Digital IC design & simulation, FPGA programming with VHDL and Verilog, Analog IC design using Cadence Virtuoso, Creation of Graphical User Interfaces and Data Acquisition Software using C/C++, LabVIEW and Python, Microcontroller programming