STAGES & MSc FINAL PROJECTS BY INGV-CT

TOPICS

- Volcano Monitoring from Space

- Volcanic Hazard Modelling

- Decision-making and risk mitigation measures

METHDOLOGY

- CNN, Cellular Automata, SPH

- Machine Learning Techniques

- High-Performance Parallel Computing

- MatLab, ENVI, Google Earth Engine

SEND YOUR CV BY EMAIL TO:

ciro.delnegro@ingv.it

Utilizzare il subject: «UNICT NOME_COGNOME»

ISTITUTO NAZIONALE
DI GEOFISICA E VULCANOLOGIA

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STAGES & MSc FINAL PROJECTS BY STMicroelectronics srl

TOPICS

Proposals from Systems Research & Applications (SRA)

- **Motor Control and Industrial**
  - *Optimization of zero speed position sensorless control algorithms for Switched Reluctance Motors – Industrial & Automotive Applications*
  - *Optimization of zero speed position sensorless control algorithms for Synchronous Reluctance Motors – Industrial & Automotive Applic.*
  - *Optimization of the performance of fault tolerant drives – Industrial &Automotive Application*
- **Power Conversion**
  - *Bidirectional converters for automotive applications*
  - *Optimization of passive components and filters*
  - *Tecniche avanzate per lo studio di EMI nei convertitori di potenza*
- **Automation**
  - *Robotics systems based on position control of three-phase PMSM*
- **Energy harvesting**
  - *An energy-autonomous and battery-free wireless sensor platform*
- **Spectral Analysis**
  - *Color recognition with Ambient Light Sensor (VD628x) supported by A.I.*
- **Wireless Connectivity**
  - *Localizzazione indoor/outdoor per sistemi IoT*

And others…

- IIoT, PdM, USBPD, …

METHODOLOGY

Common: STM32 MCU, C language, embedded programming, basics of electronics, team working, English language

Specific: Power electronics, SW tools for signal processing, SPICE, MATLAB, BLE, …

life.augmented

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STAGES & MSc FINAL PROJECTS BY STMicroelectronics srl

Proposals from Automotive&Discrete group (ADG)

TOPICS

- **Analog to Digital Converter (ADC)**
  - *In-depth Study of the possible topologies: Flash ADC, ADC SAR, ADC Sigma-Delta*
  - *Theoretical base for ADC Sigma Delta dimensioning vs characteristics of the signal to be converted*
  - *Accuracy: in-depth study of the possible techniques to enhance conversion accuracy vs temperature and voltage / current level*
  - *Advanced analog and digital techniques for Gain and Offset compensation*
  - *Exploration of possible management techniques and of possible techniques to maximize conversion speed in this context*
- **Functional Safety Mechanisms**
  - *Analysis of possible advanced Safety Mechanisms, to monitor, notify or even automatically react on possible faults on the safety path*
  - *Data transfer consistency through a communication interface and between different subsystems*
  - *ADC Self Test: comparison between different techniques in terms of coverage, cost, complexity*
  - *Specific subsystem Self Tests • Power Stage Stuck On, Stuck Off*
- **Current Sense**
  - *All DC-DC converters, whatever the used topology, need a current sense.*
  - *The current sense could be an interesting block to explore in terms of topology, speed, accuracy*

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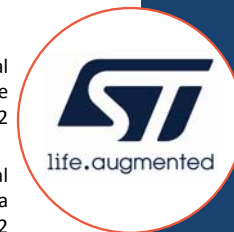giuseppe-hr.finocchiaro@st.com

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STAGES & MSc FINAL PROJECTS BY STMicroelectronics srl

Proposals from Analog,Mems&Sensor (AMS)

Proposals from Microcontroller Division (MCD)

- Digital design of a custom Single-Wire Test Interface (SWTI) IP for the test time reduction of Power Management Ics
- Complete Acknowledgement of Power Simulation for Ultra-Low-Power SoC Designs: linking and understanding Power Quality of Results from RTL SAIF annotation to final Digital Layout voltage and current measurement
- UPF (Unified Power Format) flow Power Assessment over Digital Design Implementation Cycle: a case study, power driven awareness, from RTL2Layout
- CDC (Clock Domain Crossing) and RDC (Reset Domain Crossing) flow generation and integration for Post-Synthesis Netlist: a perspective of completeness for metastability and race condition issues @post-RTL design level

- Digital verification
  - Discover the Digital Functional Verification techniques to grant the best quality to our STM32 Microcontrollers
  - Discover how to find bugs in a Digital Design and how to simulate a functional behavior and the STM32 microarchitecture

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STAGES & MSc FINAL PROJECTS BY Schneider Electric

TOPICS

- Thermodynamic closed loop control, techniques and verifications
  - *Thermodynamic characterization of refrigerated cabinets to be used in HIL (Hardware in the loop) simulations*
  - *Virtual Tour Innovation Hub | Eliwell by Schneider Electric | Services*
- Quality and process control
  - *e-PCP (Process Control Plan) drafting and completion*
  - *Realization of issue library divided by production lines*
  - *Data processing and statistical process control for a new SMT (surface mounting technology) production line*
  - *Digitize process setting and managing Schneider's apps*
  - *Digital tool deployment (Automation of the process of comparison between purchase and delivery)*
- Project Management & Marketing
  - *Digitization of Refrigeration Offer*
  - *Innovative Business Models & Strategies to monetize digital services and cloud solutions*
  - *Technical trainings digitization*

METHODOLOGIES

Labview, python, sql, Modbus protocol, Schneider tools, Industrial Protocolos,

Clouds, Standard production methodologies, FMEA, e-PCP…

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SUGGESTED STAGES & MSc FINAL PROJECTS BY **TEA**

TOPICS

Smart Lighting System: development of a linux-based system for the remote

management of an intelligent street lighting system based on LoRaWAN

METHODOLOGY

- Design and analysis of a distributed control system for the remote management of a DALI lighting system based on the new LoRa protocol (LPWAN)

- Development of the interface to manage and monitor the lighting system

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STAGES & MSc FINAL PROJECTS BY **Meridionale Impianti**

TOPICS

- SCADA Application
    - *Sviluppo sistemi di supervisione e Controllo*
    - *Sviluppo software PLC impianti industriali*
- Robot Industry 4.0 Application
    - Programming and integration Mobile robot AIV
    - Programming Industrial & Collaborative Robot
- Device IOT
    - *Sviluppo sistemi IOT (Lorawan,WiFI, Blutooth)*
    - *Progettazione e Sviluppo schede elettroniche (STM32, PC Embedded)*

METHODOLOGIES

- PLC , Ladder & Function Block programming

- Systems programming, C , C++, Python, C#

- Machine Learning, Deep Learning

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STAGES & MSc FINAL PROJECTS BY **TEORESI**

TOPICS

- **Biometric voice recognition**
- **Evaluating a Secure Firmware Update service based on Secure Embedded Device connected to Cloud Services.**
- **Analysis of an HMI touchless interaction**
- **Cooperative device interaction in precision agricolture**
- **Modeling and rapid prototyping of fuel cells**

METHODOLOGIES

- Model Based Design, automatic code generation

- Embedded systems programming, C , C++

- Human Machine Interface (Altia, QT)

- Statistical Analysis, Machine Learning, Deep Learning

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