(Allegato A) - progetti di tirocinio presentati dalle aziende partner del progetto LM+

Le proposte avanzate dalle aziende per lo svolgimento dell'esperienza di tirocinio riservata agli studenti del corso di laurea in Electronic Engineering sono:

- **Bright Solutions**: “Solid State Lasers”
- **CEA-LETI**: “Analysis and RFIC design of THz oscillator”
- **eSilicon**: “High Speed Serial Interface for Data Center Application: Mixed signal simulations, full validation and automated standard compliance test”
- **GENEGIS GI**: “PULSE urban sensor systems”
- **Infineon technologies**: “Modelling of power management for autonomous driving”
- **Prisma Telecom Testing**: “Integration and verification of testing hw/sw for 4g/5g radio access network performance assessment”
- **STMicroelectronics**: “Innovative approaches for low power, high performance MEMS products”
- **STMicroelectronics**: “Analog design for Power Combo”
- **STMicroelectronics**: “Electro-optical signal conditioning architectures based on Silicon Photonics technology”
- **TIM-ITALTEL**: “Software Defined Optical Networks - Softwarized Network Control Layer”
**Unipv**

**Progetto Laurea Magistrale Plus**
(Students enrolled for the first time in the Academic Year 2017/18, undertaking the internship in the company in 2018/19)

### University infos

- **Laurea degree** - LAUREA MAGISTRALE IN ELECTRONIC ENGINEERING
- **University tutor / Thesis supervisor** - Prof. Antoniangelo Agnesi
- **Courses / Expertize of the university tutor** - Industrial Laser Design / Laser sources, nonlinear optics, industrial photonics

### Company infos

- **Company name** - Bright Solutions
- **Company Tutor(s)** - Stefano Dell’Acqua
- **Role in the company of the tutor(s)** - R&D Project Manager

### Contents and infos on project and internship

#### Project title: Solid State Lasers

Activity scenario and targets of the internship - Area/Department/office/lab (where the trainee will be involved)
The candidate will be guided in developing specific knowledge, both theoretical and experimental, in design and realisation of laser sources and systems based on DPSS (Diode Pumped Solid State) technology. Realisation and detailed characterisation of a high-peak power pulsed DPSS laser system will be the main task. Collaboration with highly qualified professionals as well as training-on-the-job, will offer an effective way to assess the progress of field knowledge and technical skill of the candidate, including his ability in using laboratory equipment.

Background / Expertize of the student required for the internship
Knowledge of principles of modern photonics, electronics and computer science technologies at Master degree level; practical experience of photonics laboratories preferred (e.g. Master thesis)

Potential thesis topics
- **Solid-state Lasers** / Design, realization and characterization of a DPSS laser with high peak power

#### Company location and place of work

- **Design and development** - Bright Solutions Srl - Via Artigiani 27 Cura Carpignano (PV)

#### Time length of the internship

12 MONTHS

Benefits provided by the company (at least reimbursement of 500€ per month)
- Monthly allowance 500 Euro + Ticket restaurant

Specific company requests
- Strongly motivated individuals, with manual/laboratory skills, good exams score and pertinent study curriculum

Other comments
# Progetto Laurea Magistrale Plus

(Students enrolled for the first time in the Academic Year 2017/18, undertaking the internship in the company in 2018/19)

## University infos

<table>
<thead>
<tr>
<th>University degree</th>
<th>LAUREA MAGISTRALE IN ELECTRONIC ENGINEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td>University tutor / Thesis supervisor</td>
<td>ANDREA MAZZANTI</td>
</tr>
</tbody>
</table>

Courses / Expertise of the university tutor
Circuits & Systems for High Speed Communications / Industrial Topics in Microelectronics. The research interests of the academic tutor are focused on the design of integrated circuits for ultra-high speed wireless and wireline communication systems.

## Company infos

<table>
<thead>
<tr>
<th>Company name</th>
<th>CEA-LETI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Tutor</td>
<td>Dr. Jose Luis GONZALEZ-JIMENEZ</td>
</tr>
<tr>
<td>Phone</td>
<td>+33 438 78 33 58</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:joseluis.gonzalezjimenez@cea.fr">joseluis.gonzalezjimenez@cea.fr</a></td>
</tr>
<tr>
<td>Role in the company of the tutor(s)</td>
<td>Research-engineer, senior expert</td>
</tr>
</tbody>
</table>

## Contents and infos on project and internship

### Project title - Analysis and RFIC design of THz oscillator

Activity scenario and targets of the internship - Area/Department/office/lab (where the trainee will be involved):
The student will integrate the RFIC design laboratory of the Integrated Circuits, Systems and Architectures Department of LETI, the Information Technology and Electronics Research Institute of the CEA in Grenoble, France. The RFIC lab is composed by 20 permanent research engineers and 20 non-permanent staff (M.S., Ph.D., Post-Doc). The RFIC laboratory performs research and development in close contact with industry and in collaboration with other research centers and universities in the fields of low power and UWB RFIC design, devices and circuits for IoT applications, high-speed wireless communications in mmW and THz bands, front-end modules for cellular networks and WiFi, and advanced processing architectures for agile radio, radar and localization. The proposed internship is in the area of high-speed wireless communications in mmW and THz bands. The student will integrate the team of designers working in mmW IC design. He will participate fully in the laboratory activities and will have access to all the first grade design and simulation tools available in the laboratory, both for system level design (Matlab/Simulink) and for circuit design (Cadence/ Eldo/Spectre/AMS).

Background / Expertise of the student required for the internship:
Radio Frequency circuits and systems
Microelectronics, Integrated Circuits design techniques and tools

Potential thesis topics:
The stage will contribute to a larger study on novel architectures for wireless high-data rate transceivers designed using advanced CMOS technologies operating at THz frequencies. The student will be in charge of the study and design of one fundamental block of the emitter, specifically, of mmW LO generator based on advanced oscillators topologies. The outcome of this study may lead to the design of an integrated circuit in advanced technology node (FDSOI or PDPSOI CMOS) that would be fabricated in a later stage.

### Company location and place of work:
CEA-LETI DRT/DACT/SC0/LAIR
Building 52B MINATEC CAMPUS
17 rue des Martyrs, 38054 Grenoble CEDEX 9

Time length of the internship - 6 + 6 MONTHS

Benefits provided by the company (at least reimbursement of 500€ per month):
700€ stipend (brute) + 229€ possible aid for housing, if the conditions are fulfilled and all documents are provided.

Specific company requests - No specific company requests

Other comments
# Progetto Laurea Magistrale Plus

(Students enrolled for the first time in the Academic Year 2017/18, undertaking the internship in the company in 2018/19)

## University infos

<table>
<thead>
<tr>
<th>Laurea degree</th>
<th>LAUREA MAGISTRALE IN ELECTRONIC ENGINEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td>University tutor / Thesis supervisor</td>
<td>Andrea Mazzanti</td>
</tr>
<tr>
<td>Courses / Expertise of the university tutor</td>
<td>Circuits &amp; Systems for High Speed Communications / Industrial Topics in Microelectronics. The research interests of the academic tutor are focused on the design of integrated circuits for ultra-high speed wireless and wireline communication systems.</td>
</tr>
</tbody>
</table>

## Company infos

<table>
<thead>
<tr>
<th>Company name</th>
<th>eSilicon Italy s.r.l.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Tutor(s)</td>
<td>Matteo Pisati - Roberto Massolini</td>
</tr>
<tr>
<td>Role in the company of the tutor(s)</td>
<td>Staff Analog Design Engineer / Staff Hardware Engineer</td>
</tr>
</tbody>
</table>

## Contents and infos on project and internship

**Project title** - High Speed Serial Interface for Data Center Application: Mixed signal simulations, full validation and automated standard compliance test

**Activity scenario and targets of the internship - Area/Department/office/lab (where the trainee will be involved)**

The candidate will have the opportunity to choose between two types of mutually exclusive activities. **The first option is a design and mixed-mode circuit simulation activity.** The candidate will work in close contact with the system architects, analog and digital designers to simulate and verify the functionality and the performance of top level blocks of a High speed Serial Interface (SerDes).

The candidate will be exposed to state of the art high speed serial interface design and will help to validate the circuit functionality and benchmark it against the model to help verifying that the schematic design meets the electrical specifications defined by the system architects. The circuits that the candidate will deal with include: Continuous Linear Equalizers, Multi GHz VCO, fractional PLL, ADC, DAC, Band Gap, voltage/current reference and temperature sensors. **The second option is related to measurement and validation activities done in the lab on real silicon devices.** The candidate will work in close contact with the system architects, analog and digital designers, firmware and hardware engineer to test the functionality and the performance of top level blocks of a High Speed Serial Interface (SerDes).

The candidate will be exposed to state of the art high speed serial interface design and will help to test the circuit functionality and performance as well automate compliance tests specific to the standard. The candidate will use specific instrumentation and will design software to build Virtual Instruments that control the device under test.

**Background / Expertise of the student required for the internship**

Good knowledge of electronics
Able to work in a team
Good communication skill
Good spoken and written English

**Potential thesis topics:** Top level verification of 112GSps PAM4 SerDes blocks

**Company location and place of work:** Viale della Repubblica 38, 27100 Pavia Italy

**Time length of the internship:** 12 MONTHS

**Benefits provided by the company (at least reimbursement of 500€ per month)**

Reimbursement 500€ per month + 7.5€ Ticket restaurant

**Specific company requests**

**Other comments**
Progetto Laurea Magistrale Plus

(Students enrolled for the first time in the Academic Year 2017/18, undertaking the internship in the company in 2018/19)

University Infos

Laurea degree - LAUREA MAGISTRALE IN ELECTRONIC ENGINEERING
University tutor / Thesis supervisor: Fabio Dell'Acqua
Courses / Expertize of the university tutor: Remote sensing, Earth observation

Company Infos

Company name - GENEGIS Srl
Company Tutor(s) - Francesca Sapia
Role in the company of the tutor(s): rRsearch and Innovation manager

Contents and Infos on Project and Internship

Project title - PULSE urban sensor systems
Activity scenario and targets of the internship - Area/Department/office/lab (where the trainee will be involved)
The proposed stage is included in an European project in progress Pulse. The activities of this project are developed in collaboration with Prof. Gamba, for remote sensing and EO aspects, and Prof. Casella, for the GIS part.
The core of the stagier project is to integrate data from city systems (health, environment, transport, planning) with data obtained via remote sensing (satellites and UAVs) and citizens (via apps and social media) to define the levels of generalized risk (health and safety) and resilience (the capacity of local resources to support individual and community health) in specific neighborhoods across the five cities (Paris, New York, Birmingham, Singapore, Barcelona).
New research in the field of exposomics aimed at modelling the impact of climate conditions and air quality on human health using remote sensing and mobile sensing technologies.
Development of the PULSE Integrated data ecosystem based on mobile devices (smart phones), sensor systems (remote sensing, including satellites and UAVs; fixed and mobile sensors) to enable large scale collection of citizen data within the smart city environment.
PULSE will use satellites to assess and model air pollution. This technology, and associated analytics, is based on the inverse relationship between the thermal band recorded by space-borne sensors and the amount of pollution in the air. Specifically, the approach is based on the fact that air composition and characterization can be derived from satellite observations by the appropriate employment of algorithms that address the interaction between the physical effects of pollution and the soil radiance/irradiance recorded by the sensors. Pollution layers are the direct cause of a decrease of the atmospheric transmission factor at the infrared wavelengths. This effect impacts acquisitions in the thermal infrared band, as the solar heating is more affected than other wavelengths. Consequently, the sun-emitted radiance at the Earth surface appears lower than expected, and the signal reflected in any direction is lower in absolute value. Simultaneously, the pollution layer absorbs the reflected or emitted radiance, i.e., causes a pronounced loss of energy radiated upward. Hence, this physical process contributes to, and explains, the correlation between the increase in pollution and the decrease in apparent surface temperature as extracted from the thermal infrared records by airborne/satellite sensors.
To evaluate this correlation, data from satellites and measurements on the ground are correlated, allowing for the detection of changes in pollution intensity at fine resolution and in a wide geographical area. The PULSE project will utilize the NASA and ESA satellites (i.e., Landsat-8) and ESA (i.e., Sentinel-2) in order to define and create dynamic maps of urban air quality using satellite imagery. The stagier project will apply the methodology developed during the PULSE project also to the Pavia municipality as a new test site actually not included the original European project.

Background / Expertize of the student required for the internship
Good English/ previous knowledge of Python and SW GRASS.

Potential thesis topics
General topic: earth observation and environmental monitoring
Theme: integration among general environmental data regarding the urban system (health, environment, transport and planning information) and the data deduced by the remote sensing images.

Company location and place of work - Via Scarampo 47 - 20148 Milan
Time length of the internship - 12 MONTHS
Benefits provided by the company (at least reimbursement of 500€ per month)
reimbursement of 500€ per month
Specific company requests
Other comments
### University Infos

<table>
<thead>
<tr>
<th>Laurea degree</th>
<th>LAUREA MAGISTRALE IN ELECTRONIC ENGINEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td>University tutor / Thesis supervisor</td>
<td>Piero Malcovati</td>
</tr>
<tr>
<td>Courses of the university tutor</td>
<td>Industrial Measurements, Electrical Industrial Measurements, Microsensors, Integrated Microsystems and MEMS</td>
</tr>
<tr>
<td>Competences of the university tutor</td>
<td>Analog and mixed-signal integrated circuits, Sensor interface circuits, Data converters, Power electronics and power management</td>
</tr>
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### Company Infos

<table>
<thead>
<tr>
<th>Company name</th>
<th>Infineon Technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Tutor</td>
<td>Daniele Miatton</td>
</tr>
<tr>
<td>Role in the company of the tutor</td>
<td>Senior Expert Product Engineer</td>
</tr>
</tbody>
</table>

### Contents and Infos on Project and Internship

<table>
<thead>
<tr>
<th>Project title</th>
<th>Modelling of power management for autonomous driving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity scenario and targets of the internship</td>
<td>Area/Department/office/lab (where the trainee will be involved) Automotive, Power Supply. Modelling power management for automotive electronics, especially for autonomous driving applications. Modeling SW usage and benchmarking in lab with a real device. Activity will be developed at Pavia office with possible travels to other Infineon offices within UE for short periods.</td>
</tr>
<tr>
<td>Background / Expertise of the student required for the internship</td>
<td>Knowledge of analog electronics, modeling language and tools (e.g. Matlab) is a plus</td>
</tr>
<tr>
<td>Potential thesis topics</td>
<td>Mathematical and behavioral modelling of intelligent power management devices for autonomous driving cars. Model fitting with experimental validation of the Silicon solution in the laboratory and with transistor level simulations.</td>
</tr>
<tr>
<td>Company location and place of work</td>
<td>Infineon Technologies, Via Trieste 71, 27100 Pavia</td>
</tr>
<tr>
<td>Time length of the internship</td>
<td>12 MONTHS</td>
</tr>
<tr>
<td>Benefits provided by the company</td>
<td>(at least reimbursement of 500€ per month) 800€ per month + 8€ ticket restaurant per day</td>
</tr>
<tr>
<td>Specific company requests</td>
<td>Availability to travel in Europe</td>
</tr>
<tr>
<td>Other comments</td>
<td></td>
</tr>
</tbody>
</table>
# Progetto Laurea Magistrale Plus

(Students enrolled for the first time in the Academic Year 2017/18, undertaking the internship in the company in 2018/19)

## University infos

<table>
<thead>
<tr>
<th>Laurea degree</th>
<th>LAUREA MAGISTRALE IN ELECTRONIC ENGINEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td>University tutor / Thesis supervisor</td>
<td>PIETRO SAVAZZI</td>
</tr>
<tr>
<td>Courses / Expertise of the university tutor</td>
<td>Digital Signal Processing/Wireless Communication Systems</td>
</tr>
</tbody>
</table>

## Company infos

<table>
<thead>
<tr>
<th>Company name</th>
<th>PRISMA TELECOM TESTING SRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Tutor(s)</td>
<td>PAOLO TIMELLI</td>
</tr>
<tr>
<td>Role in the company of the tutor(s)</td>
<td>TEAM LEADER SYSTEM INTEGRATION &amp; VERIFICATION DEPT.</td>
</tr>
</tbody>
</table>

## Contents and infos on project and internship

### Project title

INTEGRATION AND VERIFICATION OF TESTING HW/SW FOR 4G/5G RADIO ACCESS NETWORK PERFORMANCE ASSESSMENT

### Activity scenario and targets of the internship - Area/Department/office/lab (where the trainee will be involved)

- ACTIVITY: PERFORMANCE ASSESSMENT OF DEVICE UNDER TEST PERFORMANCES BY MEANS OF SPECIFIC TRAFFIC MODELS, REPORTING AND TESTING AUTOMATION SETUP – DEPT: HARDWARE & SOFTWARE INTEGRATION & VERIFICATION

### Background / Expertise of the student required for the internship

- MOBILE NETWORKS
- PROTOCOLS & STANDARDS
- SOFTWARE DEVELOPMENT
- RADIO PROPAGATION

### Potential thesis topics

TRAFFIC MODEL DEFINITION IN ORDER TO ASSESS THE PERFORMANCE OF 4G/5G RAN (RADIO ACCEES NETWORKS)

### Company location and place of work

VIA PETROCHI 4, 20127 MILAN, Italy

### Time length of the internship

12 MONTHS

### Benefits provided by the company (at least reimbursement of 500€ per month)

700,00 EUROS + MENSA

### Specific company requests

### Other comments

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Final version
Progetto Laurea Magistrale Plus

(Students enrolled for the first time in the Academic Year 2017/18, undertaking the internship in the company in 2018/19)

**University Infos**

<table>
<thead>
<tr>
<th>Laurea degree: LAUREA MAGISTRALE IN ELECTRONIC ENGINEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td>University tutor / Thesis supervisor: Edoardo Bonizzoni</td>
</tr>
<tr>
<td>Courses / Expertise of the university tutor</td>
</tr>
<tr>
<td>Courses: Analog Integrated Circuits, Elettronica 1</td>
</tr>
<tr>
<td>Expertise: design and characterization of analog circuits (high precision amplifiers, voltage references), analog-to-digital converters (both Nyquist rate and oversampled), DC-DC converters (single or multiple outputs), and sensor interfaces.</td>
</tr>
</tbody>
</table>

**Company Infos**

<table>
<thead>
<tr>
<th>Company name: STMicroelectronics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Tutor(s): Stefano Facchinetti / Andrea Donadel</td>
</tr>
<tr>
<td>Role in the company of the tutor(s): Analog IC Designer / Team Leader of Analog Design Team</td>
</tr>
</tbody>
</table>

**Contents and Infos on project and internship**

<table>
<thead>
<tr>
<th>Project title: Innovative approaches for low power, high performance MEMS products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity scenario and targets of the internship - Area/Department/office/lab (where the trainee will be involved):</strong></td>
</tr>
<tr>
<td>The intern will carry out feasibility studies for new architectural solutions for high performance MEMS devices, in particular 6x inertial modules. The internship activity will consist of an initial phase of literature review to identify state-of-the-art solutions. Once an effective solution is identified, the intern will model it in Matlab / Simulink to clearly identify the trade-offs and advantages / drawbacks. Finally, the solution will be implemented in Cadence (schematic level design) and simulated to validate the solution in ST technology. In coordination with the layout team, the design will be put in a test chip for final characterization at bench level (if feasible within the internship time span).</td>
</tr>
<tr>
<td><strong>Product Development group within the Analog, MEMS and Sensors (AMS) Division.</strong></td>
</tr>
<tr>
<td><strong>Background / Expertise of the student required for the internship:</strong></td>
</tr>
<tr>
<td>Strong understanding of integrated analog circuit design; understanding of the implications on the layout of design choices.</td>
</tr>
<tr>
<td><strong>Potential thesis topics:</strong></td>
</tr>
<tr>
<td>Innovative approaches and architectures towards low power and high performance MEMS devices.</td>
</tr>
<tr>
<td><strong>Company location and place of work:</strong></td>
</tr>
<tr>
<td>Via Tolomeo, 1 20010 Cornaredo (MI), Italy.</td>
</tr>
<tr>
<td><strong>Time length of the internship:</strong></td>
</tr>
<tr>
<td>12 MONTHS</td>
</tr>
<tr>
<td><strong>Benefits provided by the company (at least reimbursement of 500€ per month):</strong></td>
</tr>
<tr>
<td>Reimbursement: 600€ per month; ST shuttle service to reach the place of work; Lunch included at the ST canteen.</td>
</tr>
<tr>
<td><strong>Specific company requests:</strong></td>
</tr>
<tr>
<td><strong>Other comments:</strong></td>
</tr>
</tbody>
</table>
UnipvLM+

Progetto Laurea Magistrale Plus

(Students enrolled for the first time in the Academic Year 2017/18, undertaking the internship in the company in 2018/19)

University Infos

Laurea degree LAUREA MAGISTRALE IN ELECTRONIC ENGINEERING

University tutor / Thesis supervisor - Daniele Bajoni

Courses / Expertize of the university tutor
Daniele Bajoni teaches Electromagnetism (Fisica 2) to undergraduate engineering students and “Introduction to Quantum Mechanics and Quantum Technologies” for master students in microelectronic engineering. His research is focused on integrated silicon photonics, in particular on the use of resonators to amplify optical nonlinearities and quantum effects in silicon devices.

Company Infos

Company name
STMicroelectronics

Company Tutor(s)
Antonio Fincato

Role in the company of the tutor(s)
Silicon Photonics Advanced R&D

Contents and infos on project and internship

Project title
Electro-optical signal conditioning architectures based on Silicon Photonics technology

Activity scenario and targets of the internship - Area/Department/office/lab (where the intern will be involved)
The activity involves the modeling of active electro-optical components such as optical phase shifters, modulators and switches based on ring resonators or Mach-Zehnder interferometers, as well as complex photonic architectures for sensor and / or telecom applications. The goal is to develop mathematical and behavioral models to be used in optical simulators (Lumerical, Optsim) and / or numerical computational environments (Matlab). It may be required that part of the internship be devoted to characterization. The intern will be included in a design team specialized in electro-optical structures in silicon photonics. The activity carried out may lead to the publication of articles at conferences or in international journals.

Background / Expertize of the student required for the internship
Basic knowledge in photonics, electronics and semiconductor physics. It is also required familiarity and, possibly, experience in the use of numerical computing environments (Matlab) and / or optical simulators (Lumerical, Optsim). In case the internship project foresees laboratory measurements on prototypes, laboratory experience and / or aptitude for the experimental activities is appreciated.

Potential thesis topics
Modeling of an electro-optical system - Design of active optical electro components such as optical phase shifter, modulators and switches based on ring resonator or Mach-Zehnder – Design of complex photonic architectures - Characterization of photonic components - Optical sensors (eg integrated optical gyroscopes based on Sagnac effect) - Optical communications – Quantum Photonics

Company location and place of work
Studio di Microelettronica - STMicroelectronics – Via Ferrata, 4 – Pavia; STMicroelectronics – Via Tolomeo, 1 – Cornaredo (MI)

Time length of the internship - 12 MONTHS

Benefits provided by the company (at least reimbursement of 500€ per month):
Reimbursement: 600€ per month; ST shuttle service to reach the place of work; Lunch included at the ST canteen.

Specific company requests

Other comments
Progetto Laurea Magistrale Plus
(Students enrolled for the first time in the Academic Year 2017/18, undertaking the internship in the company in 2018/19)

University info

<table>
<thead>
<tr>
<th>Laurea degree</th>
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</tr>
</thead>
<tbody>
<tr>
<td>University tutor/Thesis supervisor</td>
<td>Piero Malcovati</td>
</tr>
<tr>
<td>Courses of the university tutor</td>
<td>Industrial Measurements, Electrical Industrial Measurements, Microsensors, Integrated Microsystems and MEMS</td>
</tr>
<tr>
<td>Competences of the university tutor</td>
<td>Analog and mixed-signal integrated circuits, Sensor interface circuits, Data converters, Power electronics and power management</td>
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</table>

Company info

<table>
<thead>
<tr>
<th>Company name</th>
<th>STMicroelectronics srl</th>
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<tbody>
<tr>
<td>Company Tutor(s)</td>
<td>Giona Fucili / Maurizio Nessi</td>
</tr>
<tr>
<td>Role in the company of the tutor(s)</td>
<td>Designer Engineers</td>
</tr>
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</table>

Contents and info on project and internship

<table>
<thead>
<tr>
<th>Project title</th>
<th>Analog design for Power Combo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity scenario and targets of the internship - Area/Department/office/lab (where the trainee will be involved):</td>
<td>Design of one or more microelectronic circuits to be applied in the HDD, SSD, or Printer fields. These products include Power Management Circuits (Regulators, Motor Drivers), Analog and Mixed-Signal Circuits (D/A, A/D, Supervisory Functions, OpAmp with various requirements up to 5Gb data rate in pre-amp devices). The used technologies are BCD or BICMOS.</td>
</tr>
<tr>
<td>Background / Expertize of the student required for the internship</td>
<td>A good basic knowledge of electronics even at transistor level (Bipolar, CMOS) is essential. Knowledge of Motor and Regulator Driver, experience in Microelectronics Layout, knowledge of Cadence Virtuoso and Spice like simulators are preferred skills.</td>
</tr>
<tr>
<td>Potential thesis topics</td>
<td>Design one or more circuit that will be part of a HDD/SSD/Printer project.</td>
</tr>
<tr>
<td>Company location and place of work</td>
<td>Via Tolomeo, 1 - 20010 Cormaredo (Mi), Italy.</td>
</tr>
<tr>
<td>Time length of the internship</td>
<td>12 MONTHS</td>
</tr>
<tr>
<td>Benefits provided by the company (at least reimbursement of 500€ per month)</td>
<td>600 Euro/month</td>
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<tr>
<td>Free company canteen</td>
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<tr>
<td>Free shuttle buses</td>
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<tr>
<td>Specific company requests</td>
<td></td>
</tr>
<tr>
<td>Other comments</td>
<td></td>
</tr>
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</table>
Progetto Laurea Magistrale Plus
(Students enrolled for the first time in the Academic Year 2017/18, undertaking the internship in the company in 2018/19)

University infos
Laurea degree LAUREA MAGISTRALE IN ELECTRONIC ENGINEERING
University tutor / Thesis supervisor - Prof. Favalli - Prof. Merlo. The thesis supervisor will be one of them.
Courses / Expertize of the university tutor
Merlo - Courses: Elettronica1, Optoelettronica biomedica, MEMS; Competence areas: Photonics MEMS, MOEMS.

Company infos
Company name: TIM - Italtel
Company Tutor(s) - TIM: Marco Schiano; Italtel: Paolo Comi
Role in the company of the tutor(s) - Marco Schiano: Project Manager; Paolo Comi: Research and Innovation Manager

Contents andinfos on project and internship
Project title - TIM: Software Defined Optical Networks; Italtel: Softwarized Network Control Layer
Activity scenario and targets of the internship - Area/Department/office/lab (where the trainee will be involved)
TIM department: IP, Transport and Core networks  Italtel department: Software BU

The TIM-Italtel internship aims at providing the student good competence level in many layers of modern ICT networks, from optical fiber transport technologies and SDN (Software Defined Networking) control of IP networks to NFV (Network Function Virtualization) softwarized Network Control Layer Applications.

Objectives (TIM):
- To reinforce the student know-how on telecommunications optical technologies and on T-SDN optical networks by a review of theoretical concepts followed by lab experiments;
- To introduce the student to TSDN applied research by developing a plug-in of ONOS network operating system.
Activities:
- Optical fibres
- Passive components
- Optical amplifiers
- DWDM transmission systems
- Intensity Modulation-Direct Detection (IM-DD) transceivers
- Coherent transceivers
- IM-DD and coherent transmission degradation models
- Optical networks
- IP and optical layers integration
- SDN networks
- ONOS plugin development

Objectives (Italtel):
- To provide the student the basic concepts of management, Quality of Service (QoS) and security in ICT networks;
- To introduce the most prominent network and service virtualization techniques, with both commercial and open source solutions.
Activities:
- IP networks and their use in the telecommunications
- Network Management
- Quality of Service (QoS) and Service Level Agreement (SLA)
- Cybersecurity aspects
- Cloud computing and its implementations in open source and commercial solutions in an industrial research environment
- Network Function Virtualization (NFV)
- Software Defined Networking (SDN) for IP networks control and programmability
- Network Control Layer Applications
- Traditional telecommunication applications and services
- Novel services and applications in telecommunication networks
Background / Expertise of the student required for the internship

**TIM**
- ability to study English technical literature and to carry out effective synthesis;
- basic knowledge of fibre optics and optical transmission systems (intensity modulation direct detection receivers and transmitters);
- attitude to the use of numerical simulation tools (the familiarity with the Matlab environment is preferred).

**Italtel**
- ability to study English technical literature and to carry out effective synthesis;
- basic knowledge of IP networks;
- basic knowledge of telecommunication networks;
- attitude to teamwork;
- basic knowledge of Java or Python programming languages is welcome but not mandatory.

Potential thesis topics

**TIM:** Software defined control of optical networks

**Italtel:** Softwareization of telecommunication networks

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<th>Company location and place of work</th>
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<tr>
<td>Telecom Italia: Torino, via Reiss Romoli, 274</td>
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<tr>
<td>Italtel: via Reiss Romoli, Località Castelletto 20019 - Settimo Milanese (MI)</td>
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**Time length of the internship - 6 months in Telecom Italia and 6 months in Italtel**

Benefits provided by the company (at least reimbursement of 500€ per month)

**Telecom Italia:** 500€ per month scholarship - **Italtel:** 500€ per month scholarship

**Specific company requests**

**Other comments**