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Work Package 4:	Development and implementation of laboratories
Title:	D4.1 Development and implementation of laboratories
Lead Organization:	UdelaR
Participating Organizations:	UNI-KLU, UC3M, UNC, UNS, UNMDP, UdelaR, UCU, INCUTEX, ALASSIO, ALENET
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	Description	An upgrade of HEI lab infrastructure through the development of novel thematic joint industry-academia labs is considered in this WP. The planned five modern industry-academia labs (one per each Latin American university partner)
	Date	27.05.2022
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Task	T4.1 Creation of joint university-industry labs and modernization of the lab infrastructure	

Revision History				
Version	Date	Author(s)	Organization(s)	Brief description of change
0	27.05.2022	Graciela Corral Briones and Melina Croxcatto	UNC	Initial draft
1	30.06.2022	Graciela Corral Briones and Melina Croxcatto	UNC	First consensus version
2	6.07.2022	Leonardo Steinfeld Volpe	UDELAR	General revision
3	7.07.2022	Nicole Imbert	UCU	Additional Agreements
4	8.07.2022	Leonardo Steinfeld Volpe	UDELAR	Final revision
5	23.07.2022	Leonardo Steinfeld Volpe	UDELAR	Minor corrections (reviewer P.Donato)

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1. Introduction

The main objective of the NEON project is to improve and diversify the training of human resources, both in the academic field and in the public-private sphere, motivating innovative technologies in the Information and Communications Technologies (ICT) field, in particular the Internet of Things (IoT). The main goal of the institutions that make up the consortium is the creation of a Network of Competence (NoC) for IoT. The project will offer the framework and support to foster the industry collaboration at each country of interest, namely, Argentina and Uruguay, and, at the same time, it offers the possibility of exchange and advice from two European countries: Austria and Spain, that have demonstrated a good amount of development and innovation in the IoT field. The project's goals will be achieved by updating and improving the curricula at the different university degrees, the creation of at least 5 laboratories on IoT, the training of their academic staff and the collaboration between the local and regional industry.

Latin America (LA) is a region of the world that still does not offer a sufficient level of equal opportunities. One of the reasons for this disparity can be identified in a constantly growing population and an increasing urbanization into big and densely populated metropolises. The southern regions, especially Argentina and Uruguay, operate mostly in the primary sector of agricultural goods, mainly food. Most advanced economy sectors including high-tech industry are not well developed. Furthermore, unemployment is a constant and worrying issue in LA. Argentina and Uruguay are among the top riders of LA with the highest unemployment rates[1] as a result of a great deterioration of economy and a general decrease of the average Gross Domestic Product (GDP) due to scarce diversity in industry, lack of innovation, lack of qualified personnel especially in technology. Engineers are scarce in all areas, especially ICT. The demand is higher than the offer. Among the high tech market sectors, Internet of Things is extremely relevant since it spans several application domains, from quality and environmentally friendly agriculture, to cattle rising, to smart energy and renewables, to health applications, to the holistic vision of smart cities.

The European Union (EU) character of the project will ensure modernization of the engineering profile with the inclusion of IoT skills and knowledge by having EU Higher Education Institutions (HEI)s bring their experience and help to enhance the quality of the study programmes. Value will be attained by creating more skilled and competent graduates, which will reflect in better-qualified engineers that work in ICT companies, with specialization in IoT, and contribute to the innovation process of such companies at EU levels. Study programme improvements, innovative teaching and training methodologies, new labs, and internships will result in students being better prepared for a flexible international job market, recognized by employers at EU level, which enhances mobility opportunities. NEON focus is on IoT, which is aligned with the EU strategy of stimulating the wider application of ICT in society and economy. The objectives will be attained only if HEIs in LA and EU countries work together to exchange good practices, enhance curricula and their contents, and facilitate mutual studies and degrees recognition as well as cooperation with industry. LA companies will also benefit by rendering themselves more visible at EU level, potentially diminish the drain of experts and attract employees from the EU.

In this context, the development and implementation of laboratories can contribute to the training of human resources, both in the academic field (students, professors, technicians) and in the public - private sphere, in the field of the Internet of Things. An upgrade of HEI lab infrastructure through the development of novel thematic joint industry-academia labs is considered a necessary step towards achieving the ultimate goal of the NEON project.

[1] NEON project proposal, 2020

2. Objectives of this deliverable

The aim of Work Package 4 (WP4) is to develop and implement an upgrade of HEI lab infrastructure through the development of novel thematic joint industry-academia labs. The planned five modern industry-academia labs (one per Latin American university partner) are the following:

Signal Processing for Communications laboratory (UNS) – Modernized lab

- Testbed 1: Self-powered IoT node (BSc, MSc and training). Energy harvesting and wireless power transmission. A wireless power transmission setup that includes a transmitter and several harvester nodes will be implemented.
- Testbed 2: Measuring small antennas for IoT and harvesting. (BSc, MSc and training). A system to perform antenna measurements using a Gigahertz Transverse Electromagnetic Cell (GTEM) will be implemented.
- Testbed 3 : First steps on software defined radios (SDR) for IoT (BSc and training). Development of dedicated software platforms (Matlab and C) to explain, in a tutorial form, the main aspects of an IoT in a full communication system.

Communications Technology applied to IoT (UNdMP)

- Testbed 1 : Introductory testbed on IoT, based on Arduino platforms and different connectivity technologies (LoRa, WIFI, Zigbee, etc.).
- Testbed 2 : Microwave and Millimeter Wave Design for IoT. Design of main blocks of microwave and millimeter frequency parts of a communication system for IoT.
- Testbed 3 : Software Defined Radio (SDR) based Communications Systems.

Digital Communications Laboratory (UNC)

- Testbed 1 : IoT-based Campus Testbed. Data will be collected from sensors installed in IoT devices spread in the campus. The communications infrastructure between IoT devices will be developed to collect data from sensors.
- Testbed 2 : Digital Waveforms for IoT Applications. The objective is to understand different waveforms applied to wireless communications for IoT. The testbed is intended to develop practical skills supported by Software Defined Radio (SDR) platforms.

IoT for agribusiness Laboratory (UCU).

- Testbed 1 : The objective of this testbed is to provide the students with development boards, sensors, cameras, geolocation etc for the 'hands-on' development of IoT solutions aimed at the agribusiness industry. To narrow down the work, practices will be developed at two levels, in both cases using battery powered devices. Firstly devices with very low consumption and low data transmission rates, over long distances, using the existing NB-IoT network in Uruguay. Secondly intelligent devices embedded in low consumption, with local information processing capacity (AI, images, for example) preferably under a known operating system (Android or Linux), transmitting medium volumes of information preferably using the existing network (LTE catM, NB -IoT, etc).
- Testbed 2 : The objective is to work with a nearby rural production site, and install a monitoring (sensors, actuators, camera) and data management system of the property using different state of the art IoT tools and preferably NB-IoT, LTE-catM existing networks. The system will be in permanent operation for demonstration purposes, but during the IoT for agribusiness course at least 1 visit will be made to observe daily work in the rural environment. This system can also be used for data management in the cloud, test of laboratory work during the course, etc.

IoT Laboratory (UdelaR):

- Testbed 1 : Propagation and Antennas: The objective of this testbed is to provide the students with the basic understanding of antenna parameters such as radiation pattern, impedance, directivity, gain, polarization. Also, theory and techniques for estimating the propagation performance of a communication channel will be presented.
- Testbed 2 : Embedded Systems: The objective of this testbed is to study the different hardware and software architectures for embedded systems, learn to design hardware through component integration and to develop software (possibly including a Real-Time Operating System) for a complete system implementation.
- Testbed 3 : Wireless Sensor Networks: The aim is to understand the basic principles of operation of wireless sensor networks for IoT and to familiarize with the current technologies for their implementation.
- Testbed 4 : Digital design for low power: The aim of this testbed is to explore different low-power digital design techniques and methodologies. Power consumption estimation and measurement techniques are also included. The students would learn how to characterize power consumption in a digital system and also to incorporate power reduction techniques from early design stages.
- Testbed 5 : Communications technologies for IoT. The objective is to understand the basic characteristics and principles of current communications technologies for IoT (Lora, NB-IoT, 6LoWPAN among others).

3. Preparation Phase

In order to fulfill these requirements, during the proposal preparation phase, the L.A. HEIs have collaborated with selected industrial partners in the process of lab design and selection, and they will continue the collaboration during the phase of equipment purchase, staff training and lab demonstration and usage during and beyond the project lifetime.

The LA HEIs identified the following infrastructures for the installation of the laboratories:

* The **UNS** will install the equipment received in two specific laboratory areas (one for teaching, the other for research) that together will form the “Signal Processing and Communications for IoT lab”. Each laboratory area has 60 m2. Both areas will be dedicated to undergrad and graduate students. In addition to the devices received, this lab has available SDR and FPGA boards for student thesis and also a number of workstations with IoT sensors to work in different applications.

* The **UNMdP** will use the equipment received in two specific existing laboratory areas (for teaching) which actually are used by the Department of Electronics and Computing. Each laboratory has an area of 35 m2. Both areas will be dedicated to undergrad and graduate students. Also, there are other laboratories dedicated to research activities. Additionally to the devices acquired, the Department has SDR kits, IoT devices and FPGA boards which commonly are used by degree and PhD students in their final degree thesis or their doctoral thesis, respectively.

* The **UNC** will install the devices in the Laboratory of Digital Communication which has 100 m2 for undergraduate and postgraduate practice. It also has FPGA and SDR boards dedicated mainly to research projects and a few IoT devices for applications of low power like ambient temperature and car parking monitoring. The new devices will be deployed to give access to a higher number of students.

* The **UCU** will install the equipment achieved within the framework of the NEON project, in a new laboratory called “IoT Laboratory”, which has approximately 60m2, available for all students in the university, both undergraduate and graduate students, located in the Engineering Department. This laboratory will be equipped in order to be entirely dedicated to developing IoT projects and applications. The equipment will be composed of modules and kits for different technologies such as LoRaWAN, NB-IoT, SDR, and others. In particular, it will be used to carry out the IoT for Agribusiness course, and others related to these topics. Also, it will be available for students who want to develop extracurricular projects and theses as well. Another installation of the equipment will be placed in the agribusiness sector, particularly in a company with an ongoing application in the field. This company is being defined by the NEON project members from UCU. The application in the field will be focused on the installation of nodes, sensors and gateways in order to create a LoRaWAN network, with the aim that students can carry out practices and tests in the industry, fostering their interest in IoT.

* The **Udelar** will install the received equipment in three existing physical laboratories, two labs for undergraduate practice, and one lab for research activities related to postgraduate students. However, most equipment will be used by courses that will adopt or already embrace lab-at-home methodologies, so electronics kits, devices, and instruments will be provided to students or teams of students during the course's duration.

The HEIs contacted local and international providers to identify the last devices available in the market that fulfills the specification identified in the proposal phase of the Neon project. The result of that action was an updated list of devices of equipment sent for approval, indicating the changes and the justification (see Appendix 1 or NEON EQUIPMENT BUDGET PROPOSAL VS FOR APPROVAL in the Intranet). The EC sent a communication (email) about the approval by the project officer (see Appendix 2 or NEON Equipment approval in the Intranet).

4. Joint Lab Operation Agreements

HEIs consulted Industries on the kind of testbed considered of interest to pursue training for their employees and prospective engineers in the IoT field. Industries and industry chambers manifested their interest in pursuing cooperation with HEIs through emails and meetings where the NEON project was presented.

Follows the links to the documents (in the Intranet, also available in Appendix 3):

- minutes_NEON_CONAE
- Compromisos empresas NEON UNS
- Industries contacted by UDELAR
- compromiso empresas UNMD
- UCU Alassio Alenet

HEIs and many industries have successfully signed Memorandum of Understanding (MoU) documents that pave the way toward fruitful cooperation in a broad scope focused not only on training engineers but also on researching and developing IoT projects.
Next, follows the list of memorandum subscribed until the last meeting at Klagenfurt in May, grouped by partner (also available in Appendix 4):

- UNMDP:
  - MoU_entre UNMDP y empresa_Español_Lyrtron.pdf,
  - MoU_entre UNMDP y empresas_Español_PONCE.pdf,
  - MoU_entre UNMDP y empresas_Español_DigimageElectronica.docx ,
  - MoU_entre UNMDP y empresa_Español_TechInside.docx
- UCU:
  - MoU_entre UCU y empresa_Español_Alassio S.A.
  - MoU_entre UCU y empresa_Español_Alenet S.A.

    - MoU_entre UCU y empresa_Español_Batfer Investment S.A.
    - MoU_entre UCU y empresa_Español_Laured S.A.
    - MoU_entre UCU y empresa_Español_Minegold S.A.
- UNC:
    - MoU_entre UNC y empresa_Español_Incutex.pdf
- UNS:
    - MoU_entre UNS y Penta firmado.pdf
    - MoU_entre UNS y Alliansys.pdf
- UDELAR:
    - MoU_entre_Udelar_y_Focus_firmado.pdf
    - MoU-entre-Udelar_silvermist_firmado.pdf

.Subsequent and future agreements with industries and other institutions will be uploaded to the intranet as part of WP4.

5. Definition of the Procurement Procedure

One of the requirements to fulfill this task was the definition of the procurement procedure regarding the equipment for the planned five modern industry-academia labs (one per Latin American university partner).

Although each partner and institution has its specific procurement procedure, we have defined some indicators to monitor the progress of the purchase process.. The defined procurement procedure steps are four(from more advanced one to a less degree of development in the purchase steps), as follows:

1) Delivered: the item has already been delivered to the institution.

2) Payment: the item has been paid to the vendor (bank transfer, by credit card or similar) and is waiting to be shipped or is on its way.;

3) Ordered: the purchase order has been started for the selected item although the payment has not been done yet;

4) Selected: the item was already selected but the purchase order has not been started yet.

Throughout the whole process, each partner has followed a checklist with the above steps to monitor the progress of acquisition, and overall information regarding the item purchased, the vendor selected, the purchase requisition and order, information about the payment, whether the item was delivered and if there is still a standstill or not.

Table 1 shows the amount (in EUR) per partner divided into the defined categories.

Table 1: Progress status per partner (amount in EUR)

	Delivered	Payment	Ordered	Selected	Total (EUR)
UNS	0	0	42.628	16.772	59.400
UNMdP	0	0	39.500	19.900	59.400
UNC	30.070	930	0	0	31.000
UCU	19.986	0	0	39.414	59.400
UdelaR	17.096	12.777	12.240	17.287	59.400
Total	67.153	13.707	94.368	93.372	268.600

Figure 1 shows progress status as a percentage of the total amount per partner, where Figure 2 depicts equipment procurement's general status.

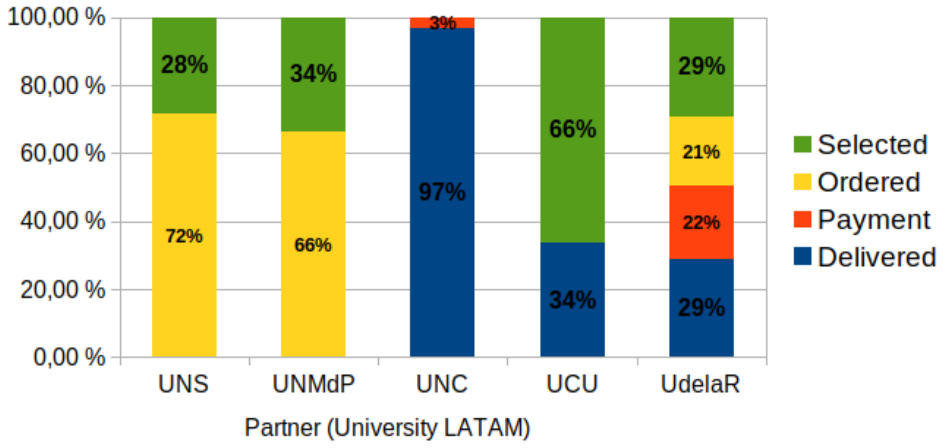

Figure 1: Progress status per partner (in percentage)

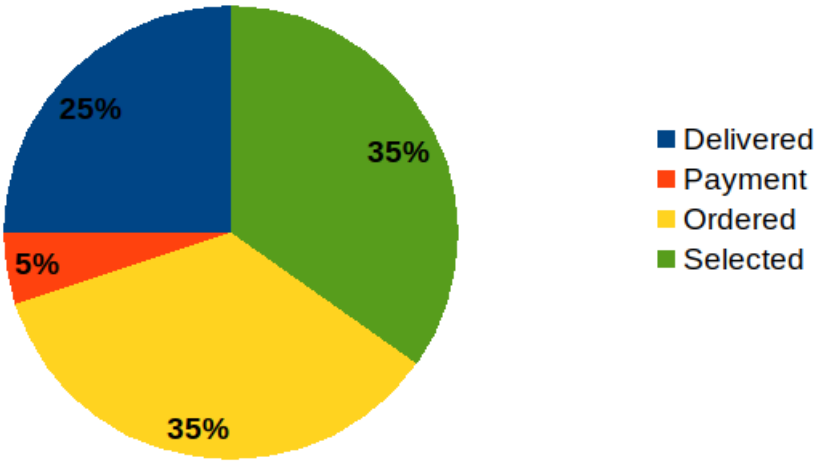

Figure 2: Progress status (whole project)

6. Conclusion

As stated throughout this document, three of the milestones of this work package have been achieved successfully: partners have collaborated to develop and implement the HEI lab infrastructure through the development of novel thematic joint industry-academia labs (M4.1); formal links and joint lab operation agreements between universities and companies were established (M4.2), and the procurement procedure has been also defined (M4.3).

The documents and graphics shown in this document are updated to the Klagenfurt meeting date, that is, 1st of May, 2022.

Next steps will be the uploading, from each partner, of the new agreements and the updated purchase status (since it is an ongoing task) into Confluence, within the WP4 section.

Appendix 1

Consolidated equipment list sent to EC

4. Equipment Costs							
Work Package	Partner N°	Name of Partner	Country	Nature, type and specifications of the item	Amount Excluding VAT (EUR)	Total (EUR)	Changes and justification
Development	P3	Universidad Nacional de Córdoba	Argentina	**IoT-based Campus Living Lab:** 2x Outdoor fixed IoT gateway; 2x Outdoor mobile IoT gateway; 5x Outdoor Fixed IoT Nodes; 5x Outdoor Mobile Nodes; 1x Drone DJI	26.400,00	26.400,00	No change
Development	P3	Universidad Nacional de Córdoba	Argentina	**Digital Waveforms for IoT Applications:** 8x ADALM-PLUTO Software-Defined Radio Active Learning Module	4.600,00	4.600,00	We have decided not to buy a Matlab license and, instead, to use python for this lab. This change enables us to increase the numbers of SDR from 6x to 8x, and therefore give simultaneous access to more students.
					0	0	
Development	P4	Universidad Nacional del Sur	Argentina	**Signal Processing for Communications laboratory - Self-powered IoT nodes:** 2x P1110-EVAL-PS, PowerSpot® RF Wireless Power Development Kit, OTII-ARC-001 Otii Arc, portable power supply, a current and voltage measurement unit and a data-acquisition module, 2 PC computers, 6x USRP B210 SDR Kit 2x2 (70 MHz - 6GHz) - Ettus Research, Equipment software update: Adds functionality to perform Vector Signal Analysis (VSA) to the R&S FPL1000. Rohde and Schwarz FPL1-K70 - Vector Signal Analysis Application for modulation analysis on digital modulated single carrier signals (software license) and . R&S®VSE-K106 LTE narrowband IoT analysis	27.620,00	27.620,00	The software update required by the SMU-200 generator is discontinued (original proposal). We replace it by software update of FSV spectrum analyser. It will be very useful to improve the capacity of our Lab to study and evaluate IoT signals.
Development	P4	Universidad Nacional del Sur	Argentina	**Signal Processing for Communications laboratory - Measuring small antennas for IoT and harvesting:** 1x GigaHz transverse electromagnetic cell, Wideband power amplifier Minicrcuits ZHL-1W-63-5+, 600 MHz a 6 GHz 1W (30 dBm) '+ RF SMA adapters + RF attenuators	24.400,00	24.400,00	No change
Development	P4	Universidad Nacional del Sur	Argentina	**Signal Processing for Communications laboratory - First steps on software defined radios for IoT:** 10x SDR Pluto AD: low-cost Software defined radio, 3 Notebook,10x USB to Ethernet converter,	7.380,00	7.380,00	No change
					0	0	
Development	P5	Universidad Nacional de Mar del Plata	Argentina	**Communications Technology applied to IoT - Hand on IoT Lab:** WIFI services with ESP32 modules. Teensy 4.1 platform. Adafruit integration platforms. LORA communications technologies. 2 Gateway LoRa. Arduino platforms. Sensor various. Printer machine 3D. 5 Mini PC Raspberry Pi. 5 Notebooks. 5 Monitors (21" or more). 2 PC Servers. 2 Routers. Smart Blackboard Interactive (86" or more). Cameras. 1 Led Projector Screen (5000 lums or more). Small power supplies. Little tools, accesories, electrical materials and components for lab instalation.	18.000,00	18.000,00	No changes, but a more specified list. The purpose is to develope a full hands-on-IoT lab with the possibility of both remote and in-site access. IoT technolgies include Adafruit, Lora, Arduino (with accesories) and also sensors, actuators, computers, monitors, keyboards, memories, cameras, smart blackboard, projector screen.Additionally also a list of accessories is included, with tools and components to develop the lab like electrical cabling and materials, lable printer, 3D printer.
Development	P5	Universidad Nacional de Mar del Plata	Argentina	**Communications Technology applied to IoT - IoT in Smart Grids:** interface to grid equipment and associated software: furniture, electronic tools, portable instruments, lab supplies (5.500 euros). 2 Desktop PCs, I7, 32 GB RAM, 480 GB SSD, Video Card (2400 euros), 3 Notebooks (3600 euros). SDR modules: 4 RTL 2832U, 3 Analog Devices ADALM PLUTO (1200 euros)	13.000,00	13.000,00	No changes, but a more specified list. The purpose is to develop a complete lab for Communications on Smart Grids with the possibility of both remote and in-site control.
Development	P5	Universidad Nacional de Mar del Plata	Argentina	**Communications Technology applied to IoT - Microwave and Millimeter Wave Design for IoT:** Millimeter and microwave frequency measurement equipments. RF Spectrum Analyzer up to 6.5GHz (16.800 euros). One seat high-performance 3D ElectroMagnetic software for designing and analyzing EM systems Simulia Academic CST Studio Suite Research Base Pack (PLC + ALC of S2R-1)(5.700 euros). 8x ADALM PLUTO SDR (2000 euros). 8x RTL SDR2832U (1000 euros). SMA connectors + SMA cables + FR4 substrate + antennas + SMA/N adapters + N cables + printed circuit boards + RF accessories (2500 euros)	28.400,00	28.400,00	Frequency measurement equipment was specified. One seat high-performance 3D electromagnetic (EM) software package for designing and analyzing EM systems was added. It is an useful and important software tool for RF lab and, in general, for RF teaching. Additionally, a set of SDR devices was added to carry out serveral practices. In the same line, connectors, antennas, cables, PCBs and other accessories were included, in order to carry out experimental practices.
					0	0	
Development	P6	Universidad de la República	Uruguay	**IoT Laboratory - Propagation and Antennas:** SIMULIA Academic CST Studio Suite Research Supplemental Pack 1 (S2R-4) + Supplemental Pack 2 (S2R-20) – 24 seats (perpetual licenses and one year of maintenance); Accessories (connectors, adaptors, cables, and other materials)	15.162,00	15.162,00	No change. An excellent final price of the CST software allowed to redirect funds to strengthen other test labs that need extra equipment to face pandemic restrictions (implement lab-at-home).
Development	P6	Universidad de la República	Uruguay	**IoT Laboratory - Embedded Systems:** 40x Launchpad MSP430, 40x Sensor booster pack (Texas Instruments); 20x Analog Discovery 2 (Digilent)	6.809,00	6.809,00	The justification is an increased number of kits (launchpad + Sensor Pack), from 20x to 40x, and added 20x USB scope to implement lab-at-home (one set per student instead of one set per group) to deal with pandemic restrictions.
Development	P6	Universidad de la República	Uruguay	**IoT Laboratory - Wireless Sensor Networks:** 30x wireless sensor node (Re-mote rev-b) (Zolertia Inc) 30x Launchpad CC1350 (Texas Instruments), Accessories (cable assemblies, connectors, and other materials)	4.182,00	4.182,00	The justification is an increased number of kits (from 15x to 30x) by Zolertia and added 30x low-cost kits to implement lab at home (one set per student instead of one set per group) to deal with pandemic restrictions
Development	P6	Universidad de la República	Uruguay	**IoT Laboratory - Digital design for low power:** NGU 201 Souce Measurement Unit (Rohde & Schwarz). 2 Quadrants, Output voltage: 0 V to 20, Max. output/sink power: 60 W, Max. output/sink current ≤ 6 V: 8 A; > 6 V: 3 A, Max. acquisition rate 500 ksample/s); 9x Otii Arc. (Qoitech AB); 2x HV Power Monitor (Monsoon), Accessories (cables, connectors, and other materials)	17.912,00	17.912,00	Detailed specification of smart power supply system, and subtituted 1x high bandwidth osilloscope by 11x power monitor in order to enable home activitides by students (lab measurements, 9x Otii and 2xHV Power Monitor) , to deal with pandeic restrictions.
Development	P6	Universidad de la República	Uruguay	**IoT Laboratory - Communication Technologies for IoT:** 40x MCU module (M4 Clicker), 40x LoRa module (LR 2 Click), 40x NB-IoT module (LTE IoT 2 Click), 80x antennas (Mikro Electronika) 40x Jlink-EDU (Segger Cortex programmer) 1x Kona Micro IoT gateway (Cell modem, with Battery backup), 1x Kona Macro IoT Gateway | 4G and GPS 40x RTL-SDR Blog R820T2 RTL2832U 1PPM TCXO SMA Software Defined Radio with Dipole Antenna Kit, 10x RTL-SDR Blog Multipurpose Dipole Antenna Kit, 20x ADALM-PLUTO Software-Defined Radio Active Learning Module, 2x RFSPACE TSA600 Ultra Wideband UWB Antenna 600-6000+ MHz for UWB TX/RX SDR Radar GPR SIGINT EMC Test ADSB WiFi FVP Drone Video Vivaldi Tapered Slot, 2x RFSPACE Ultra Wide Band IoT Antenna 800 MHz - 6 GHz for UWB TX/RX SDR Radar IOT GPR SIGINT EMC Test ADSB WiFi FVP Drone Video Vivaldi Antenna, 5x RFSPACE DIP700, 2x bladeRF 2.0 micro xA9, 2x bladeRF 2.0 micro case, 5x YouLoop Portable Passive Magnetic Loop Antenna for HF and VHF Accessories (adapters cables, adapter connectors, and other materials)	15.335,00	15.335,00	Added detailed specifications of SDR modules. Increased number of kits (MCU kit + LoRa module + NB-IoT module), from 10x to 40x and, including 40x MCU programmer (Jlink-EDU) to implement lab-at-home (one set per student instead of one set per group) to deal with pandemic restrictions. Added one LoRa Gateway to enable more set-up scenarios).
					0	0	
Development	P7	Catholic University of Uruguay	Uruguay	**IoT for agribusiness laboratory - Design Lab:** 20x Kit for NB-IoT (Development board for NB-IoT and GPS module), 20x Kit for IoT with Android (Development Board for IoT with Android and UHF module), 20x SDR Design Kit, 20x Portable Circuit Laboratory, 10x PC, 20x LoRa Development Kit, 1x LoRa Gateway, 1x UHF RFID Portal, 4x Low Power DC Analyzer, 1x Soldering Station.	46.100,00	46.100,00	No change.
Development	P7	Catholic University of Uruguay	Uruguay	**IoT for agribusiness laboratory - Test Site:** 3x Outdoor LoRa Gateway, Group of Sensor and Actuators for farm Installation with LoRa Nodes, 1x UHF RFID Portal with 6x UHF Hand Held, 1x PC + UPC, 3x PLC.	13.300,00	13.300,00	No change, only better specification of material in the bundle of sensors and actuators for farm installation with the addition of LoRa nodes and with 6x UHF Hand Held devices.
					Total:	268.600,00	

Appendix 2

EC equipment approval

Subject: NEON: Equipment approval
From: "Schneider, Emma" <Emma.Schneider@aau.at>
Date: 20/12/21 05:23
To: "graciela.corral@unc.edu.ar" <graciela.corral@unc.edu.ar>, "jcousseau@uns.edu.ar" <jcousseau@uns.edu.ar>, "carrica@fi.mdp.edu.ar" <carrica@fi.mdp.edu.ar>, "leo@fing.edu.uy" <leo@fing.edu.uy>, "mmiguez@ucu.edu.uy" <mmiguez@ucu.edu.uy>
CC: "Tonello, Andrea M." <Andrea.Tonello@aau.at>

Dear partners from UNC, UNS, UdelaR, UNMdP and UCU,

I have very good news: the list of **equipment was approved by our project officer from the EC.**

Here the email reply:

Thank you for sending the revised list of equipment for the partners and for providing a better specification of the items to be purchased, it is very clear.

Given the reasons indicated, we can agree with the changes proposed.

Please note that the eligibility of each individual item can only be confirmed at the end of the project once the final financial analysis is carried out.

I also take the opportunity to remind you that in case of purchases of more than 25.000€, the launch of a tendering is needed.

I wish you a good continuation and I hope that the process of acquiring the material will be smooth for all partners.

Therefore there is green light to start acquiring equipment. I will announce this also during Thursday's meeting.

If you have any questions (e.g. concerning tendering) let us know.

Best regards
Emma

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Appendix 3

First contacted industries

NEON
Network of Competence on Internet of Things

Co-funded by the Erasmus+ Programme of the European Union

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MEETING	**|MINUTES**
Meeting date | 13-7-2021	Meeting location | *Córdoba, Argentina*
Chair | Graciela Corral Briones	Minutes compiled | Graciela Corral Briones
Attendees: Martín Ayarde y Felipe Luis Pasquevich	

AGENDA

1	Presentation of the NEON project, G- Corral Briones – UNC
2	Presentation of research projects at Laboratorio de Comunicaciones Digitales - Martín Ayarde - UNC
3	Identification of a joint university-agency lab that enables training, prototyping and research in the field of spatial and satellites Communications

MINUTES Day 1

Agenda item 1: Presentation of the NEON project

The online meeting wa opened at 14:30 by Graciela Corral Briones using the google meet platform. Graciela presented the the member institutions of the NEON project,
She summarized the main objectives of the project, in particular the creation of joint university-industries laboratories on IoT, creation of educational material, and training. Them, she presented the new equipment that will be acquired for these laboratories.

Agenda item 2: Presentation of research project at Laboratorio de Comunicaciones Digitales (LCD)

Martín Ayarde summarizes the research projects in the field of satellite communications that are conducting at the LCD.

Agenda item 3: Identification of a joint university-agency lab that enables training, prototyping and research in the field of spatial and satellites Communications

Graciela Corral Briones exposed the great opportunity to develop a testbed based on software defined radio for rapid prototyping of classic and new algorithms.
Felipe Pasquevich commented about the importance of design on COTs for the new satellite constellations.
All the attendees agree on writing a MoU to define the expectations of each party in the establishment of a joint university and space-agency lab

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Action items	Person responsible	Deadline
1 Write a Memorandum of Understanding, detailing the activities of each partner wants to pursue in the SDR Lab jointly created by UNC and CONAE	Graciela Corral Briones	26-11-2021
2 Create a list of SDR platforms that can be available in the Lab.	Martín Ayarde	17-9-2021
3 Define convenient operation of the laboratory	Felipe Pasquevich	17-12-2021

Dr. Ing. Graciela Corral Briones
Full Professor of Digital Communication
Universidad Nacional de Córdoba

Ing. Felipe Luis Pasquevich
Asesor en la Subgerencia de Investigación, Desarrollo e Innovación - CONAE

Ing. Martín Ayarde
PhD student

Compromiso Zyzygy Inc.

Edgardo Promenzio Sat, Apr 2, 4:44 PM (2 days ago)

to Juan

Estimado Juan,

Gracias por el contacto y la información compartida. Es reconfortante ver el impacto positivo que proyectos como NEON pueden proveer a la comunidad como un todo y en particular al desarrollo del conocimiento. Los felicito por el constante trabajo que llevan adelante y suscribo al esfuerzo de incentivo con el cual siempre trato de comprometerme.

Por favor contá con la participación de Zyzygy en esta iniciativa. Tenemos algunos proyectos en carpeta dentro del dominio IoT que esperamos poder desarrollar en conjunto.

Saludos cordiales,

Edgardo Promenzio
Technology Partner
Zyzygy Inc.

Compromiso Emtech SA

Guillermo Guichal Sat, Apr 2, 5:02 PM (2 days ago)

to **Mauro**, Juan

Estimado Juan Cousseau,

Estamos muy interesados en participar en la iniciativa NEON. Desde Emtech tenemos proyectos de desarrollo propias y con clientes en el área de IoT.

Los datos de la empresa son:

Contacto principal: Guillermo Güichal, CEO, gguichal@emtech.com.ar, +54 291 4062063

Empresa: Emtech S.A., Viamonte 685, Bahia Blanca, Argentina

Saludos,

Guillermo E. Guichal

Voice: +54 (291) 403-7923
Mobile: +54 9 (291) 408-2063
gguichal@emtech.com.ar
www.emtech.com.ar

Compromiso Alliansys SRL

Sebastián Pérez 10:46 AM (5 hours ago)

to **Sebastian**, **Emanuel**, Juan

Estimado Juan,

Confirmo que estamos interesados en participar.
Estamos gestionando la incorporación del pasante, y por supuesto que cualquier agenda sobre IoT. en que podamos participar lo haremos con mucho gusto e interés.

Saludos

Sebastián

Compromiso PENTA SA

daniel etcheto 11:09 AM (4 hours ago)

to Juan

Estimado Juan

Muchísimas gracias por tenernos presente para este tipo de proyectos de cooperación.

Le confirmo nuestro interés por ser una de las empresas participantes en el Proyecto.

Estamos a su disposición para complementar cualquier documentación adicional que requiera para dar curso al Memorando de Entendimiento propuesto.

Atentamente

Daniel A. Etcheto
Penta s.a.

- Kreitech
  - web: https://kreitech.io/
  - contactos: Emiliano Braña <ebrana@kreitech.com.uy>, Rafael Sisto <rsisto@kreitech.com.uy>
- Sikron
  - web: https://sikron.me/
  - contacto: Naya de Souza <naya@sikron.tech>
- Focus Ing.
  - web: https://www.focusingenieria.com.uy/
  - contacto: Mauricio Gonzáles <mgonzalez@focusingenieria.com.uy>

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MEETING	**|MINUTES**
Meeting date | 15/2/2021	Meeting location | UCU
Chair | Matias Miguez	Minutes compiled | Nicole Imbert
Attendees: (signed roster) Matias Miguez, Alfredo Arnaud, Agustín Derregibus, Felipe Estevez.	

AGENDA

1	Meeting the team that will be working on the project from UCU, Alassio S.A. and ALENET S.A.
2	Description of general items of the NEON Project.
3	Review the tasks that each institution should lead.
4	Sign the Partnership Agreements.

MINUTES Day 1

1- People in charge of the project from each institution (UCU, Alassio S.A. and ALENET S.A.) met, to put in common the generalities.

2- They described the aims and the main items of the project. They were looked up the proposal and the budget documents.

3- The tasks each institution should lead in the different stages of the project were listed, and the laboratory and other implementations that will be carried out through the stages were mentioned. They talked about the purpose and importance of the project for Uruguay.

4- The Partnership Agreements were signed by all the partners.

Action items	**Person responsible**	**Deadline**
1 Send the signed Partnership Agreements (two copies) to Austria.	Matias Miguez, Alfredo Arnaud, Agustín Derregibus, Felipe Estevez.	

MEETING	|MINUTES
Meeting date | 7/6/2021	Meeting location | UCU
Chair | Matias Miguez	Minutes compiled | Nicole Imbert
Attendees: (signed roster) Matias Miguez, Agustín Derregibus, Felipe Estevez, Nicole Imbert	

AGENDA

1	Description of general items of the NEON Project.
2	Review of survey responses and propose to send it to other people.

MINUTES Day 1

1- The stage of the project was described, and the main tasks to be accomplished in the coming months were listed. There was also talk of preparing the reporting material.

2- It was reviewed who answered the survey until the moment, and it was proposed some people to whom send the survey.

Action items	Person responsible	Deadline
1 Send survey and review responses.	Matias Miguez, Agustín Derregibus, Felipe Estevez, Nicole Imbert	14-6-2021

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MEETING	|MINUTES
Meeting date | 3/9/2021	Meeting location | UCU - Montevideo
Chair | Matías Miguez	Minutes compiled | Nicole Imbert
Attendees: (signed roster) Matías Miguez, Felipe Estévez, Lucio Barbieri	

AGENDA

1	Members of Alassio S.A. went to the laboratory in UCU.
2	They took measures of a device they are developing.

MINUTES Day 1

1- Matías Miguez received Felipe and Lucio from Alassio S.A., who went to the UCU to visit the electronic laboratory and to make use of it. They analized the features it has and suggested a few recommendations to implement in the new laboratory on IoT.

2- A brief report by Felipe Estévez:

"Currently BQN is carrying out a custom development of a telemetry device. The objective of the project is to install these devices throughout Montevideo / Uruguay, with all nodes communicating with a central server in the company through the NB-IoT network (being deployed by ANTEL).

Part of the device's requirements (as is common in IoT devices) is to have a very low consumption, given that:
- due to physical restrictions, the battery has to be small
- due to the large number of devices to be installed, it is not practical to replace or maintain them, therefore the useful life has to be very long (more than 5 years).

These requirements mean that the device cannot have a consumption greater than (approximately) 10μA (micro-Ampere). With the equipment we have at BQN, it is not possible for us to measure such low currents, therefore we have no way of confirming that the theoretical consumption is reflected in reality.

The UCU has two SMUs (Source Measure Unit), which within their functionalities, allow feeding a circuit with a fixed voltage and accurately measuring the current delivered. One of the equipment accurately measures some micro-Amperes, while the other reaches nano-Amperes. For our purposes we use the first one.

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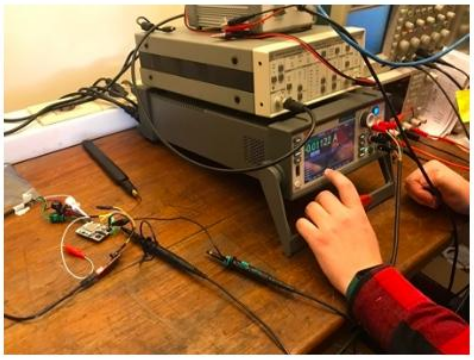
We immediately verified the usefulness of the equipment, since our device was presenting consumption orders of magnitude greater than the estimated. After investigation of the circuit and specifically of the low-power configuration of the main microcontroller of the device, we managed to arrive at the estimated consumption, constantly checking with the SMU.

Although we managed to reach the theoretical consumption of the microcontroller's low consumption mode, thanks to the SMU we saw that it increases considerably when leaving the ideal conditions of absolute minimum consumption (enough to exceed the desired 10μA). This led to new research being carried out to redesign the device in order to lower consumption.

This step of the project would not have been possible (without incurring the high costs for the company) if it had not been for the collaboration with the UCU to allow us to use their SMU and for the technical advice of Matías Miguez when carrying out the tests."

A few pictures of the visit to the laboratory:



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Appendix 4

MoU signed until the first meeting at Klagenfurt

MEMORANDO DE ENTENDIMIENTO ENTRE LYRTRON SA Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, LYRTRON SA (en Adelante "LYRTRON") y los socios académicos (en adelante, las "Partes") del Proyecto NEON (Proyecto N°618942-EPP-1-2020-1-AT-EPPKA2-CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para LYRTRON y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes
- Visitas de estudiantes a LYRTRON

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes y LYRTRON deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes y LYRTRON no tendrán

San Martín 5391 - Mar del Plata - Argentina
Teléfono: (+5423) 474 2929
E-mail: ceo@lyrtron.com.ar
www.lyrtron.com.ar

Co-funded by the Erasmus+ Programme of the European Union

ninguna responsabilidad entre sí en virtud del presente acuerdo.

5. Relación jurídica

Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes y LYRTRON. Nada en este MoU creará una relación legal entre las Partes y LYRTRON.

6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre LYRTRON:

Lugar: Mar del Plata, Argentina

Fecha: 11/04/2022

Firmado en nombre de proyecto NEON:

Lugar: Klagenfurt, Austria

Fecha:

Nombre, firma y sello de UNI-KLU

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www.lyrtron.com.ar

Co-funded by the Erasmus+ Programme of the European Union

MEMORANDO DE ENTENDIMIENTO ENTRE
Calonian SAS
Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, Calonian SAS (en Adelante "PONCE") y los socios académicos (en adelante, las "Partes") del Proyecto NEON (Proyecto N°618942-EPP-1-2020-1-AT-EPPKA2-CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para PONCE y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes
- Visitas de estudiantes a PONCE

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes y PONCE deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes y PONCE no tendrán ninguna responsabilidad entre sí en virtud del presente acuerdo.

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5. Relación jurídica

Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes y PONCE. Nada en este MoU creará una relación legal entre las Partes y PONCE.

6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre PONCE:

Lugar: Mar del Plata, Argentina

Fecha: 19/04/2022

Nombre, firma y sello de la empresa

Firmado en nombre de proyecto NEON:

Lugar: Klagenfurt, Austria

Fecha:

Nombre, firma y sello de UNI-KLU

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MEMORANDO DE ENTENDIMIENTO ENTRE
TECH INSIDE S.A.S.
Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, TECH INSIDE S.A.S. (en Adelante TECH INSIDE) y los socios académicos (en adelante, las "Partes") del Proyecto NEON (Proyecto N°618942-EPP-1-2020-1-AT-EPPKA2-CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para TECH INSIDE y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes
- Visitas de estudiantes a TECH INSIDE

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes y TECH INSIDE deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes y TECH INSIDE no tendrán ninguna responsabilidad entre sí en virtud del presente acuerdo.

TECH INSIDE

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5. Relación jurídica

Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes y TECH INSIDE. Nada en este MoU creará una relación legal entre las Partes y TECH INSIDE.

6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre TECH INSIDE:

Lugar: Mar del Plata, Argentina

Fecha: 11/04/2022

Nombre, firma y sello de la empresa

Guillermo Mandagaran

Director Administrador Titular

Firmado en nombre de proyecto NEON:

Lugar: Klagenfurt, Austria

Fecha:

Nombre, firma y sello de UNI-KLU

TECH INSIDE

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MEMORANDO DE ENTENDIMIENTO ENTRE
ALENET S.A.
Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, ALENET S.A. (en adelante, "Nettra") y los socios académicos (en adelante, las "Partes") del Proyecto NEON (Proyecto N° 618942-EPP-1-2020-1-AT-EPPKA2-CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para Nettra y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes en pasantías en Nettra
- Visitas de estudiantes a Nettra

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes y Nettra deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes y Nettra no tendrán ninguna responsabilidad entre sí en virtud del presente acuerdo.

5. Relación jurídica

Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes y Nettra. Nada en este MoU creará una relación legal entre las Partes y Nettra.

6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre de ALENET S.A.:

Agustín Berrojbus

Lugar: Montevideo, Uruguay

Fecha: 2/5/22

Nombre, firma y sello de la empresa

Firmado en nombre de proyecto NEON:

Lugar: Klagenfurt, Austria

Fecha: 5/5/22

Nombre, firma y sello de UNI-KLU

Andrea Tomelli

NEON
Network of Competence on Internet of Things

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MEMORANDO DE ENTENDIMIENTO ENTRE
BATFER INVESTMENT S.A.
Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, BATFER INVESTMENT S.A. (en adelante, "BATFER") y los socios académicos (en adelante, las "Partes") del Proyecto NEON (Proyecto N° 618942-EPP-1-2020-1-AT-EPPKA2-CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para BATFER y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes en pasantías en BATFER
- Visitas de estudiantes a BATFER

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes y BATFER deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes y BATFER no tendrán ninguna responsabilidad entre sí en virtud del presente acuerdo.

5. Relación jurídica

Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes y BATFER. Nada en este MoU creará una relación legal entre las Partes

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y BATFER.

6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre de BATFER INVESTMENT S.A.:

Lugar: Montevideo, Uruguay

Fecha:

Nombre, firma y sello de la empresa

Joan Reinaldo

Batfer Investment S.A.

Firmado en nombre de proyecto NEON:

Lugar: Klagenfurt, Austria

Fecha:

Nombre, firma y sello de UNI-KLU

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Network of Competence centers on Internet of Things

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MEMORANDO DE ENTENDIMIENTO ENTRE LAURED S.A. Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, LAURED S.A. (en adelante, "IOTEC") y los socios académicos (en adelante, las "Partes") del Proyecto NEON (Proyecto N° 618942-EPP-1-2020-1-AT-EPPKA2CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para IOTEC y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes en pasantías en IOTEC
- Visitas de estudiantes a IOTEC

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes e IOTEC deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes e IOTEC no tendrán ninguna responsabilidad entre sí en virtud del presente acuerdo.

5. Relación jurídica

Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes e IOTEC. Nada en este MoU creará una relación legal entre las Partes e IOTEC.

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6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre de LAURED S.A.:

Miguel Angeloff

Lugar: Montevideo, Uruguay

Fecha: 21/06/2022

Nombre y firma

Firmado en nombre de proyecto NEON:

MATIAS MIGUEZ

Lugar: Montevideo, Uruguay

Fecha: 21/06/2022

Nombre y firma

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MEMORANDO DE ENTENDIMIENTO ENTRE Minegold S.A. Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, Minegold S.A. (en adelante, "0G Uruguay") y los socios académicos (en adelante, las "Partes") del Proyecto NEON (Proyecto N° 618942-EPP-1-2020-1-AT-EPPKA2-CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para 0G Uruguay y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes en pasantías en 0G Uruguay
- Visitas de estudiantes a 0G Uruguay

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes y 0G Uruguay deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes y 0G Uruguay no tendrán ninguna responsabilidad entre sí en virtud del presente acuerdo.

5. Relación jurídica

Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes y 0G Uruguay. Nada en este MoU creará una relación legal entre las Partes y 0G Uruguay.

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NEON
Network of Competence centers on Internet of Things

Co-funded by the Erasmus+ Programme of the European Union

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6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre de Minegold S.A.:

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Max Patissier
87D42100709478...

Lugar: Montevideo, Uruguay

Fecha: 01/04/2022

Nombre, firma y sello de la empresa

Max Patissier

Firmado en nombre de proyecto NEON:

Lugar: Klagenfurt, Austria

Fecha: 5/5/22

Nombre, firma y sello de UNI-KLU

Andrea Tonello

NEON
Network of Competence on Internet of Things

Co-funded by the Erasmus+ Programme of the European Union

MEMORANDO DE ENTENDIMIENTO ENTRE ALASSIO S.A. Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, ALASSIO S.A. (en adelante, "BQN") y los socios académicos (en adelante, las "Partes") del Proyecto NEON (Proyecto N° 618942-EPP-1-2020-1-AT-EPPKA2-CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para BQN y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes en pasantías en BQN
- Visitas de estudiantes a BQN

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes y BQN deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes y BQN no tendrán ninguna responsabilidad entre sí en virtud del presente acuerdo.

5. Relación jurídica

Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes y BQN. Nada en este MoU creará una relación legal entre las Partes y BQN.

6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre de ALASSIO S.A.:

Lugar: Montevideo, Uruguay
Fecha: 27/April/2022
Nombre, firma y sello de la empresa
FELIPE ESTÉVEZ

ALASSIO S.A.

Firmado en nombre de proyecto NEON:

Lugar: Klagenfurt, Austria
Fecha: 5/5/22
Nombre, firma y sello de UNI-KLU
Andrea Tonella

MEMORANDO DE ENTENDIMIENTO ENTRE PENTA S.A. Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, PENTA S.A. (en adelante, "**PENTA**") y los socios académicos (en adelante, las "**Partes**") del Proyecto NEON (Proyecto N° 618942-EPP-1-2020-1-AT-EPPKA2-CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para PENTA y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes en la Universidad Nacional del Sur
- Visitas de estudiantes a PENTA

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes y PENTA deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes y PENTA no tendrán ninguna responsabilidad entre sí en virtud del presente acuerdo.

5. Relación jurídica

Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes y PENTA. Nada en este MoU creará una relación legal entre las Partes y PENTA.

6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre de PENTA:

penta

Lugar: Bahía Blanca, Argentina
Fecha: 20/04/2022
Nombre, firma y sello de la empresa

PENTA S.A.

Firmado en nombre de proyecto NEON:

Lugar: Klagenfurt, Austria
Fecha: 20/04/2022
Nombre, firma y sello de UNI-KLU

PENTA S.A.

MEMORANDO DE ENTENDIMIENTO ENTRE
Incutex S.R.L.
Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, Incutex S.R.L. (en adelante, Incutex) y los socios académicos (en adelante, las "Partes") del Proyecto NEON (Proyecto N° 618942-EPP-1-2020-1-AT-EPPKA2-CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para [acrónimo/nombre de la empresa] y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes
- Visitas de estudiantes a Incutex

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes [insertar el acrónimo/ nombre de la empresa] deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes y [insertar el acrónimo/nombre de la empresa] no tendrán ninguna responsabilidad entre sí en virtud del presente acuerdo.

•incutex

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5. Relación jurídica

Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes y [insertar el acrónimo/nombre de la empresa]. Nada en este MoU creará una relación legal entre las Partes y [insertar el acrónimo/nombre de la empresa].

6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre de Incutex

Pablo Manzano

Lugar: Córdoba, Argentina

Fecha: 7/4/2022

Nombre, firma y sello de la empresa

Firmado en nombre de proyecto NEON:

Lugar: Klagenfurt, Austria

Fecha:

Nombre, firma y sello de UNI-KLU

•incutex

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MEMORANDO DE ENTENDIMIENTO ENTRE
FOCUS INGENIERIA SRL
Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, Focus Ingenieria SRL (en adelante, "Focus") y los socios académicos (en adelante, las "Partes") del Proyecto NEON (Proyecto N° 618942-EPP-1-2020-1-AT-EPPKA2-CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para Focus y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes en Focus
- Visitas de estudiantes a Focus

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes Focus deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes y Focus no tendrán ninguna responsabilidad entre sí en virtud del presente acuerdo.

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made of the information contained therein.

5. Relación jurídica

Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes y Focus. Nada en este MoU creará una relación legal entre las Partes y Focus.

6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre de Focus Ingeniería SRL:

M. Sc. Ing. Agustín Rodríguez Esteva

Lugar: Montevideo

Fecha: 26 de abril de 2022

Focus Ingeniería SRL

Firmado en nombre de proyecto NEON:

Dr. Ing. Leonardo Steinfeld
Coordinador Udelar (NEON)

Lugar: Montevideo, Uruguay

Fecha: 28 de abril 2022

FOCUS

MEMORANDO DE ENTENDIMIENTO ENTRE SILVERMIST S.A. Y LOS SOCIOS ACADÉMICOS DEL PROYECTO NEON

1. Propósito

Con el objetivo de promover la cooperación en la educación académica y la investigación, así como de preparar a los estudiantes para sus primeros trabajos en la industria, Silvermist S.A. (en adelante, "Khimo") y los socios académicos (en adelante, las "Partes") del Proyecto NEON (Proyecto N° 618942-EPP-1-2020-1-AT-EPPKA2-CBHE-JP) entran en el siguiente Memorando de Entendimiento ("MoU").

2. Formas de cooperación

Dentro de los campos que sean mutuamente aceptables para Khimo y las Partes, podrán perseguirse las siguientes formas de cooperación, entre otras:

- Actividades conjuntas de investigación
- Participación de los estudiantes inscriptos en programas académicos de las Partes en Khimo
- Visitas de estudiantes a Khimo

3. Acuerdos Financieros

Todos los acuerdos financieros entre las Partes Khimo deben negociarse y acordarse mutuamente y dependen de la disponibilidad de fondos dentro del Proyecto NEON.

4. Responsabilidad

Excepto por pérdidas o daños causados por negligencia grave o dolo, las Partes y Khimo no tendrán ninguna responsabilidad entre sí en virtud del presente acuerdo.

5. Relación jurídica

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Este MoU se interpretará como una declaración de propósito para promover una colaboración genuina y mutuamente beneficiosa entre las Partes y Khimo. Nada en este MoU creará una relación legal entre las Partes y Khimo.

6. Inicio, renovación, terminación

Este MoU entrará en vigencia a partir de la fecha de la última firma del mismo y permanecerá vigente durante toda la duración del proyecto NEON.

Firmado en nombre de Silvermist S.A.:

Lugar: Montevideo

Fecha: 29/4/2022

Federico Núñez Artigas
Director

Firmado en nombre de proyecto NEON:

Lugar: Montevideo, Uruguay

Fecha: 29/04/2022

Dr. Ing. Leonardo Steinfeld
Coordinador Udelar (NEON)

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