Università della Svizzera italiana

Faculty of Informatics

Field Project Atelier 2024

Instructors

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ing. Mauro Prevostini

Introduction

Introduction

This Booklet describes the list of field project positions available at the companies participating to the Field Project Atelier (SA5) during Fall semester 2024.
The Field Project Atelier consists of an experience in collaboration with a company.
The goal is for the students to obtain hands-on experience with real world problems. The Field Project Atelier can be done individually or as a group, depending on the given context.

Since 2014 the Faculty of Informatics collaborated in this context with 48 companies offering field projects to 204 students.
This year we have 16 companies on board, offering a total of 31 positions.

FPA 2024 Schedule

The Field Project Atelier 2024 will take place from September 20 to December 13, 2024, at the company on Thursdays and Fridays.

Important dates are as follows:

- September 19: Kick-off meeting at USI
- September 20: Beginning of the field project at the company
- October 23: Update meeting students-instructors at USI
- November 27: Update meeting students-instructors at USI
- December 13: Closing session at USI

All meeting mentioned above are mandatory in order to obtain the 9 ECTS.

Students' Duties

You are given time until May 12 to express your preferences ranked as 1, 2, 3, 4 by means of the following form (first-in first-served):

https://forms.gle/gvQSN48Kp7kj65GC6

Should a student not do so, he/she will be assigned a project.

List of Field Projects

4bases

Website	https://4bases.ch/
Contact	Stefano Casali stefano.casali@4bases.it
Number of available positions	1
Address	c/o Tecnopolo Ticino Via Cantonale 18, 6928 Manno
Mode of Work	Remote
Languages Requested	English
Previous Field Project Atelier SA5 participation	2023

Company Description

4bases SA was founded in 2013, with the mission to design, develop, optimize and validate end-to-end diagnostic solutions based on Next Generation Sequencing. The company is ISO 13485 certified for the production of genetic test kits, which are sold in 70 countries at hospitals up to public or private laboratories and research centers. The expertise of 4bases was born in oncology, and has extended to rare diseases, focusing on precision medicine solutions.

Project Title

A MLOps implementation to enhance genomics reporting in clinical settings

Project Description

In the last years, the scientific community has put a relevant effort into the identification and prioritization of variants of interest in clinical settings to improve the management of a variety of disorders, ranging from cancer to heart and rare diseases. 4bases has been involved in this collective effort from the very start of his lifecycle by developing a bulk of CE-IVD kits which are commonly used in the EMEA region by multiple clinical and diagnostic-focused customers. In this context, 4bases has built a bioinformatic infrastructure to allow users from all over the world to focus on relevant diagnostic information only, by using the proprietary cloud platform 4eVAR and the computational tools and resources to gain specific insights from each sample analyzed thanks to the company's NGS-based kits.
The 4eVAR platform allows the bioinformatic analysis starting from the FASTQ generated by sequencers based on different technologies (Oxford Nanopore Technologies in primis), and helps users to retrieve clinically relevant information from variants sequenced in each sample. These variants are then reported in tab-delimited text files to aid the decision-making process. To facilitate this task we developed a easy-to-use dashboard to look at both technical and clinical results in a glance. The idea behind this project is to work on a MLOps implementation in order to use Machine Learning and AI algorithms to prioritize reported variants in the final step of the bioinformatic analysis. The candidate will work closely with the Bioinformatics Team and the ML expert of the group to perform training, fine-tuning and deployment of the model to production. The candidate will interrogate the internal database to find relevant features to be used in the model training, hyperparameters optimization and orchestration of the model in order to continuosly stream new data to the model, re-train it and serve this information within the bioinformatic pipeline.

Technologies to be used

Python, with a focus on libraries for Machine Learning, like scikit-learn, PyTorch or Keras, and possibly for interaction with SQL databases.

4BMC Sagl

Website	https://4bmc.ch
Contact	Carlo Vespa, carlo@4bmc.ch
Number of available positions	1
Address	Via Luganetto 4, 6962 Viganello
Mode of Work	To be defined
Languages Requested	Italian and English
Previous Field Project Atelier SA5 participation	2022, 2023

Company Description

4BMC is a Solutions Agency that helps SMEs harness the power of advanced technologies, including artificial intelligence (AI) and blockchain, to improve their operations and offerings. The agency focuses on leveraging these technologies to provide innovative solutions and services that enhance efficiency, security, and market insights. With a suite of tools ranging from AI analytics to blockchain applications, 4BMC aims to equip businesses with the capabilities to thrive in a digital landscape,

Project Title

Bandosubito

Project Description

The student will have the opportunity to engage in a dynamic and innovative environment of 4BMC by working on Bandosubito, an AI-based platform revolutionizing the way private individuals and organizations access subsidized finance opportunities. By leveraging the power of artificial intelligence, Bandosubito simplifies the complex landscape of European, national, and local grants, matching the unique characteristics and goals of users with the most suitable funding opportunities available in its extensive database.

Working on the Bandosubito project, the student could be involved in a variety of technical aspects, depending on their skills and interests. For those inclined towards front-end development, tasks might include enhancing the user interface and user experience (UI/UX) of the web application. This could involve designing and implementing intuitive and attractive interfaces, improving the navigation flow, or integrating interactive features that make the search and application process as smooth as possible for users.

Alternatively, students with a passion for back-end development might work on the infrastructure of the web application. This could involve developing and maintaining the servers, databases, and application logic that power Bandosubito. One critical task could be implementing web scrapers to continually update the grant database with the latest funding opportunities. This requires a keen eye for data extraction, transformation, and loading (ETL) processes, as well as an understanding of how to maintain data integrity and relevance.

Moreover, students may have the chance to add new features to the platform, such as personalized grant recommendations based on user profiles, automated alerts for new grants matching specific criteria, or tools to streamline the application process for grants. These enhancements would not only improve the user experience but also increase the value Bandosubito provides to its users, making it an indispensable tool in the search for subsidized financing.

Working on Bandosubito offers students a unique opportunity to apply their technical skills to real-world challenges, contributing to a product that has a tangible impact on individuals and organizations seeking financial support for their projects. Through this experience, students can gain valuable insights into the intersection of technology, finance, and public policy, while also honing their development skills in a practical setting.

Technologies to be used

python (django), html, css, javascript (vue3)

Alten Switzerland AG

Website	https://www.alten.com/
Contact	Umberto Mancino, umberto.mancino@alten.ch
Number of available positions	2
Address	Riedstrasse 11, 6330 Cham / ZG - Switzerland (Field Project Address: Corso San Gottardo 14, 6830 Chiasso)
Mode of Work	In Presence
Languages Requested	Italian and English
Previous Field Project Atelier SA5 participation	None

Company Description

Alten is a Consultancy Firm providing support with a wide range of expertise in Engineering and IT Services in order to meet the technological needs of its clients. The Skills and Offers Department brings together and coordinates at the transnational level, specialists and consultants, experts in their profession who support our clients, in more than 30 countries, in their issues of digital transformation, innovation, product development, supply chain, change management, etc.

Project Title

Test Automation in Continuous Integration

Project Description

Project Overview:

This project will create a continuous integration (CI) pipeline for a Java web application. The pipeline will use the following tools:

- GitHub for source code management
- Maven for build automation
- JUnit for unit testing
- Selenium for integration testing
- Jenkins for CI orchestration

Project Setup:

1. Create a GitHub repository for the web application.
2. Create a Maven project for the web application.
3. Add JUnit unit tests for the web application.
4. Add Selenium integration tests for the web application (this stage must be configured from an external yml file)
5. Install Jenkins and configure it to run the Maven build and the JUnit and Selenium tests.

CI Pipeline:

The CI pipeline will consist of the following stages:

1. Checkout: The code from the GitHub repository will be checked out into the Jenkins workspace.
2. Build: The Maven build will be used to build the web application.
3. Unit Test: The JUnit unit tests will be run to verify the correctness of the web application.
4. Integration Test: The Selenium integration tests will be run to verify the functionality of the web application.
5. Non Regression Test: This stage execute all the functional tests to proof that the previous functionality works fine with the new implementation.
6. Deploy: If all of the tests pass, the web application will be deployed to a staging environment.

Project Benefits:

The CI pipeline will provide the following benefits:

- Early detection of errors: Errors will be detected early in the development process, which will reduce the cost of fixing them.
- Improved quality: The CI pipeline will help to improve the quality of the web application by ensuring that it is well-tested.
- Increased productivity: The CI pipeline will help to increase the productivity of developers by automating the build and test processes.

Conclusion:

This project demonstrates how to create a CI pipeline for a Java web application. The CI pipeline can be used to improve the quality and productivity of the development process.

Technologies to be used

Java, JUnit, GitHub, Maven, Selenium, Jenkins

The working place of the Field Project will be at Corso San Gottardo 14, 6830 Chiasso

AnswerConsulting SA

Website	https://www.answerconsulting.ch/
Contact	Jacopo Malnati j.malnati@answerconsulting.ch
Number of available positions	Project 1) 2 Project 2) 2
Address	Via Penate 4, 6850, Mendrisio
Mode of Work	Hybrid (50% in presence and 50% remote)
Languages Requested	Italian and English
Previous Field Project Atelier SA5 participation	None

Company Description

We help organizations reinvent Enterprise Content Management (ECM) through agile technology, world-class technical expertise, and strategic vision (and to you it means nothing, I get it. We are a cool, young team of hardcode coders, motorbikers, and amateur astronomers having fun in the office).

Project Title

Bit Nugget - Big Data Analysis and Visualization for Improved Navigation and Insight

Project Description

This internship project focuses on the comprehensive analysis of extensive data sets, often referred to as big data, within enterprise content management instances. These repositories are replete with millions of documents in various formats, associated metadata, document versions, user data, user-assigned permissions, audit events, and more. With copious amounts of data available, there's a critical need for a holistic overview serving two primary purposes: to develop a novel system for navigating the content beyond traditional hierarchical structures and to identify issues (bad-smell detection) and trends based on the available data. The project entails the creation of 2D and 3D visualizations of the database, data relationships, and their evolution. These visualizations will potentially benefit both business users and administrators, facilitating a deeper understanding of the data landscape and enabling informed decision-making.

Technologies to be used

Groovy, JavaScript, rendition engines/frameworks to be defined

Project Title

Max q - Streamlining Unit and Stress Testing

Project Description

This internship project revolves around the development of a continuous testing framework within an existing web-based IDE framework, supplemented with scripting objects. The objective is to create a versatile framework capable of crafting unit test scripts and stress tests, defining datasets for input, and specifying post-test execution housekeeping tasks. The aim is to establish an interface and structure facilitating the execution of these tests, along with dashboards, reports, and notifications to provide developers and administrators with comprehensive visibility into test execution outcomes. This initiative aims to streamline the testing process within the IDE environment, enhancing efficiency and ensuring robust application performance.

Technologies to be used

Groovy, JavaScript, Microsoft Playwright

A POC of the project already exists

Banana.ch

Website	www.banana.ch
Contact	José Del Romano, jose@banana.ch
Number of available positions	Project 1) 2 Project 2) 1
Address	Via la Santa 7, 6962 Viganello
Mode of Work	Hybrid (50% in presence and 50% remote)
Languages Requested	Italian and English
Previous Field Project Atelier SA5 participation	2019, 2020, 2021, 2022, 2023

Company Description

Banana.ch SA was founded in Lugano in 1990. The business is focused on the production and sale of Banana Accounting+, a financial accounting software for enterprising people, small businesses, association managers and individuals. Banana is a spreadsheet-inspired accounting software, has sold more than 300000 licenses worldwide and is a leader in Switzerland. In 2002 was the first accounting software in the world to introduce blockchain technology to ensure the legal validity of accounting data.

Project Title

Software Telemetry with KUserFeedback.

Project Description

Telemetry in software, provides useful information for developers and maintainers that users are not always able to communicate. Telemetry tools are intended to collect, transform, and communicate data on performance, functionality, processing speed, errors, and security events of systems in production.

This project aims to evaluate and discover the features of the KUserFeedback telemetry framework.

The tasks are as follows:

- Install the KUserFeedback server on a dockerized system.
- Integrating the KUserFeedback library into the prototype software
- Study the telemetry possibilities and how to apply them to the prototype
- Adding telemetry to the prototype software
- Analyze telemetry results
- Briefly document each step for deployment

Technologies to be used

CMake, C++, Qt Framework, Docker, php

The company has max 2 positions available: 2 in this project OR 1 in this + 1 in the other one

Project Title

Webassembly WebApp with authentication

Project Description

This project is divided into 3 stages:

1) Compile and run a simple webapp created with c++ and Qt Framework.
2) The WebApp will then need to be published to a webserver (docker on your development machine).
3) the WebApp will then need to interface with the webserver authentication service or Microsoft Entra ID: it can only run after the user has successfully authenticated.

Technologies to be used

C++, Qt Framework, WebAssembly, Wasm, CMake, Docker, Webserver

The company has max 2 positions available: 1 in the this project + 1 in the other OR 2 positions in the other one.

Brightside Capital

Website	https://brightside-capital.com/
Contact	anxhela.vendresha@brightside-capital.com
Number of available positions	3
Address	Via Balestra 11, 6900 Lugano
Mode of Work	In Presence
Languages Requested	English
Previous Field Project Atelier SA5 participation	2020, 2021, 2022, 2023

Company Description

Family Office - A finanical advisor for Ultra High Net Worth Individuals or Families. We manage the interests of 22 italian families through investment decision and spot-on reporting. We have a mixed imprint between the american world (young motivated team, competitive environment, meritocracy and team before the individual) and latin culture, promoting, within that framework, your own creativity.

Project Title

Fintech Hub - Integration of first class finance softwares and automating the delivery of data

Project Description

We are the leadership team of a Multi Family Office based in Lugano, Switzerland. During the first 5 years in business, we saw the biggest increase in masses in the Consolidation Services which, vis a vis the Wealth Management portion of the business, generates less revenue per Asset Under Management, requires a bigger maintenance but has bigger in potential for revenue growth. The potential fast growth of the Consolidation Services, being a lower margin business and requiring skilled personnel to provide a high touch service to our clients (required when working with Ultra High Net Worth Individuals), has been identified as the bottleneck for the sustainability of our growth in the scalability of the business. To solve the problem, we built an MVP of a hub aimed to connect the wealth management custodial data into external software needed to deliver our Services, all while monitoring the data at all time to ensure top quality and applying check otherwise done manually. We developed the platform with an architecture that enable us to resell it so, while using the MVP version to ease Brightside daily operation, we are looking to enhance the platform to become a sellable version SaaS version of our back hand software. 2021 will be dedicated to the transformation of the MVP into a marketable product.

As per your role in the project, below a few ideas:
• Improve the functionalities of the central hub, responsible of managing all integrated data, by continuously monitoring the data within itself.
• Develop a new data integration in input, by taking standard files (CSV, Excel etc..) to be manipulated accordingly and to be integrated inside the Hub.
• Improve the integration workflow with already connected software, through APIs or secure file delivery.
• Develop ex-novo new processes to be added to the umbrella of services we provide.
• Improve data management by interconnect more different data source than we currently do.
• If you are willing to go the extra mile, you could collaborate to some more complex project, that can eventually lead to a Thesis Abstract. In this regard, we currently had a couple of USI Master Student researching a new innovative functionality for our software.

You will join a team of a senior software architect, and 3 other developers. Most the team is ex- USI and everybody is less than 30 years old.

Technologies to be used

Python, Django, Pandas, AWS, SFTP, API, Asynchronous/Sychronous Programming, Web Developing, Vue

We changed address. We moved now in Via Balestra 11, 6900 Lugano

Claranet

Website	https://www.claranet.ch/
Contact	Celestino Bellone, celestino.bellone@claranet.com
Number of available positions	1
Address	Via Luganetto 4, 6962 Lugano
Mode of Work	In Presence
Languages Requested	English
Previous Field Project Atelier SA5 participation	2023

Company Description

Claranet combines pioneering technologies, practices, and expertise to propel our customers' ambitions. Through a vibrant customer centric culture of collaboration, learning, and opportunity, we nurture a dynamic community of the best technology and service expertise spanning cloud, cybersecurity, networks, and unified communications. With over 3,000 employees, we are based in offices across Europe, the United States and Brazil.

Project Title

Claranet IaC Library

Project Description

Claranet Switzerland maintains an internal IaC (Infrastructure as Code) library to provide its customers with consistent and standardized components.
Maintaining a library of IaC components streamlines infrastructure provisioning by ensuring consistency and standardization across projects. Reusable components save time and effort, promoting efficiency and scalability as infrastructure needs evolve.
The library serves as a repository of knowledge and expertise, aiding in the onboarding of new team members and in sharing best practices. Additionally, it enhances security and compliance by enforcing standardized configurations and practices across all projects.
We are constantly evolving our library to stay up to date with the latest features from cloud vendors and to adhere to the latest security best practices.

Your job will be to add new components to our library and review existing ones.

Technologies to be used

- Terraform
- AWS CloudFormation
- AWS CDK (Typescript)
- Terraform CDK (Typescript)

Codelounge

Website	https://codelounge.si.usi.ch/
Contact	Davide Paolo Tua, davide.paolo.tua@usi.ch
Number of available positions	2
Address	USI, Campus Est
Mode of Work	In Presence
Languages Requested	Italian
Previous Field Project Atelier SA5 participation	2017, 2018, 2019, 2020, 2021, 2023

Company Description

CodeLounge è il centro di ricerca e sviluppo del Software Institute - USI, Lugano. CodeLounge riunisce competenze provenienti dal mondo accademico e industriale, con due obiettivi principali: spingere le idee oltre i prototipi, realizzando prodotti reali, e svolgere ricerca applicata nelle aree dello sviluppo del software, della visualizzazione, dell'evoluzione e dell'analisi. Essendo parte del Software Institute, collabora con i gruppi di ricerca e promuove progetti interdisciplinari.

Project Title

Ampliamento del Field Project Atelier Manager

Project Description

Dal 2014 la Facoltà di Scienze informatiche dell'USI coltiva rapporti con aziende del territorio per offrire la possibilità agli studenti del 3º anno di Bachelor di fare un'esperienza lavorativa durante il loro percorso di studi nel contesto del Field Project Atelier (Software Atelier 5). Il Field Project Atelier ha una durata di 12 settimane, da metà settembre a metà dicembre, per un totale di circa 200 ore e può essere svolto individualmente o in gruppo, a seconda del contesto.

Ad oggi, le aziende interessate a offrire un Field Project agli studenti devono compilare un formulario per ogni progetto che desiderano proporre entro il 31 marzo. Nel corso del mese di aprile gli studenti idonei ad affrontare un Field Project ricevono un opuscolo con tutte le proposte e vengono invitati a esprimere le loro preferenze. Successivamente, i responsabili di Software Atelier 5 effettuano le assegnazioni e gli studenti ricevono l'esito delle assegnazioni entro la fine di maggio.

L'obiettivo di questo progetto è quello di estendere un portale dedicato a Software Atelier 5 per automatizzare, questo processo.
Le aziende utilizzano al momento il portale per proporre i loro progetti. Una volta completato l'inserimento dei progetti, tramite il portale è possibile generare automaticamente un PDF da utilizzare come booklet con la lista dei progetti proposti.

L'estensione della piattaforma prevede le seguenti nuove funzionalità:
- la possibilità per gli studenti di esprimere le loro preferenze sui progetti.
- la possibilità per i responsabili di Software Atelier 5 di effettuare le assegnazioni dei progetti in maniera "automatica".
- il portale comunica agli studenti l'esito delle assegnazioni.

Technologies to be used

Il portale web è stato sviluppato utilizzando Spring Boot e Kotlin.
Spring Boot è una moderna libreria che semplifica lo sviluppo di applicazioni HTML lato server e API REST.
Kotlin è un linguaggio di programmazione di alto livello, simile a Java.

Gli studenti saranno seguiti da Davide Paolo Tua (CodeLounge) e Mauro Prevostini (co-responsabile di SA5).

CyberTel Group SAGL

Website	https://www.cybertelgroup.com/
Contact	Marco Moscini marco.moscini@cybertelgroup.com
Number of available positions	2
Address	via madonnetta 15
Mode of Work	Remote
Languages Requested	Italian and English
Previous Field Project Atelier SA5 participation	None

Company Description

Cybertel Group SAGL specializes in simplifying cybersecurity and IT challenges for small and medium-sized businesses. We offer tailored solutions that empower our clients by helping them reduce costs, and enhance efficiency. Through consultation, hardware, software, and training services in IT, power, and telecommunications, we're dedicated to helping our clientele make informed, secure, and cost-effective decisions for sustained success in the digital age.

Project Title

IoT Monitoring System

Project Description

The environment in which we live is of vital importance to our health and well-being. In this context, an IoT-based environmental monitoring system can play a crucial role in providing real-time information on temperature, humidity, and other environmental parameters.

Project Objectives:

1.Hardware and Sensor Development
At the heart of our IoT environmental monitoring system will be sensors. We will use a combination of sensors to detect various environmental parameters such as:

- Temperature and humidity sensors to monitor environmental thermal conditions.
- Brightness sensors to record ambient light intensity.
- Other types of environmental analysis sensors such as smoke detectors, etc.
- We may opt for either digital or analog sensors, depending on the specific project requirements.

2.Network Software Development
Once data is collected from the sensors, we will need to transmit it efficiently to a central server for processing and visualization. We will use communication protocols like MQTT (Message Queuing Telemetry Transport) to send data over the Internet or a local network.
Programming the network software will require knowledge of programming languages such as Python and Java. We will need to manage sensor connections, data transmission, and communication error handling.

3.Data Processing and Analysis
Once data is transmitted to the server, it needs to be processed and analyzed to extract meaningful insights.

4.User Interface and Data Visualization
Once processed and analyzed, environmental data must be made accessible to end-users in a clear and intuitive manner. We will create a web-based user interface (UI) allowing users to view real-time data and access historical data.
We will use web technologies like HTML, CSS, and JavaScript to design and develop the user interface.

5.Implementation of Advanced Features
Finally, we will implement some advanced features to enhance the utility of our IoT environmental monitoring system. These may include:

- Push notifications to alert users when anomalies are detected or certain safety limits are exceeded.
- Support for remote data access via mobile devices, allowing users to monitor the environment even when they are not physically present at the site.

6.Project Benefits
The project will offer numerous benefits both to the student and the community:

- Development of Practical Skills: The student will have the opportunity to apply their theoretical knowledge of programming, software engineering, and mathematics to a real project.
- Positive Environmental Impact: The IoT environmental monitoring system will contribute to raising awareness about air quality and addressing challenges related to air pollution.
- Interdisciplinary Experience: The project involves a variety of disciplines including programming,

engineering, mathematics, and environmental sciences, providing the student with a comprehensive interdisciplinary experience.

Technologies to be used

Arduino Microcontroller or Raspberry Pi (if available can be simulated through external software) , Sensors, Linux Os, Python or Java Developing Language, MQTT. Android App Developing Software. Apache or similar for webserver, HTML, CSS, and JavaScript for HMI. Virtualbox or Vmware.

Based on student's skills a third position can be available. The students must know networking principles and virtualizazion like Virtualbox or Vmware.

Duferco

Website	https://www.duferco.com/
Contact	Fabio Iannello, fabio.iannello@duferco.com
Number of available positions	2
Address	Via Trevano 2A, 6900 Lugano
Mode of Work	Hybrid (50% in presence and 50% remote)
Languages Requested	English
Previous Field Project Atelier SA5 participation	2021, 2022, 2023

Company Description

Duferco is an international company active in several areas, including: energy, steel, shipping and innovation. The field project will be developed together with the corporate innovation team, whose objective is to bring digital technologies, including advanced analytics, machine learning and AI, in everyday operations within Duferco.

Project Title

LLM-Based Application for Private Document Exploration and Inquiry

Project Description

This project aims to create a proof of concept (POC) for an all-encompassing application designed to explore and interrogate private documents. It will leverage Language Models (LLMs) either through a Retrieval-Augmented Generation (RAG) configuration or by interfacing with LLMs APIs. The objective is to investigate various methods for efficient data retrieval and response generation. Additionally, it may entail crafting components for a web application or a bot interface resembling that of Telegram. Objectives:

- Develop an end-to-end application that harnesses LLMs-based RAGs or APIs to explore and inquire into private documents or proprietary data.
- Assess and compare different methodologies to optimize performance and cost-effectiveness.
- Design components suitable for integration into a web application and/or a bot interface similar to Telegram.

Technologies to be used

- Python and relevant libraries (including fastAPI)
- SQL databases and data warehouses
- Technologies for ETL (Extract, Transform, Load)
- Web application frameworks (e.g., React)
- Telegram APIs
- Cloud technologies - AWS
- Team Composition

Preferably 2 students will collaborate on the project. In the case of a single student, project goals will be adjusted accordingly.

EOC - Ente Ospedaliero Cantonale, Area ICT

Website	https://www.eoc.ch/
Contact	Project 1) Team Pizzo di Claro: Vasco, Piffaretti, vasco.piffaretti@eoc.ch Project 2) Team Adula, Ermanno, Scanagatta, ermanno.scanagatta@eoc.ch
Number of available positions	Project 1) 1 Project 2) 1
Address	Via Lugano 4B, 6500 Bellinzona
Mode of Work	In Presence
Languages Requested	Project 1) Italian Project 2) Italian and English
Previous Field Project Atelier SA5 participation	2019, 2020, 2021, 2023

Company Description

The EOC is the multisite hospital in Ticino where it has a presence with its institutions throughout the entire canton with a total of 1,000 beds. Thanks to the commitment and expertise of its more than 5,000 employees and their focus on human relations, the EOC ensures quality health care for 380,000 patients a year.

Project Title

SCAN project

Project Description

create a webapp that accesses the scanner connected to the user's PC
To update our technology stack we are looking for a solution to replace the current active-x which interfaces with the Twain protocol and allows scanning of documents starting from a webapp.
We have currently found the following libraries:
- https://www.dynamsoft.com/web-twain/overview/
- http://asprise.com/document-scan-upload-image-browser/direct-to-server-php-asp.net-overview.html

Project objectives:
- analyze the proposed libraries and look for alternatives
- compare the solutions found (costs, functionality, support, ...)
- Implement POCs to evaluate their simplicity of integration into current software and performances

Technologies to be used

React, typescript

1 student would be enough, if 2 students want to work in pair on this project for us it is ok.

Project Title

PDF Filler project

Project Description

Many partners of the hospital don't offer (yet) B2B webservices but expect our doctors to use some PDF templates (from the partner website) to get access to their services. As an example EOC often relies on Inselspital in Bern for some special analyzes. To reduce burocracy and automate repetitive manual tasks, we would like to get the structured data from GECO (our internal HIS) and prefill them in the PDF.
There are 2 types of PDF we may want to support:
- PDFs with PDF Form (example https://hzl.insel.ch/fileadmin/HZL/Dokumente/Auftragsformulare/Formulaire_Demande_d_analyse_pour_l)
- PDFs without form fields (example https://zlm.insel.ch/fileadmin/Zentrum_f%C3%BCr_Labormedizin/Dokumente/Auftragsformulare/Auftrag)

We have found some PDF libraries able to manipulate both types of PDFs (example https://kb.itextpdf.com/itext/filling-out-forms)

Project objectives:
- analyze the proposed libraries and look for alternatives
- estimate the complexity and costs of filling PDFs without form fields
- Implement POCs to evaluate their simplicity of integration into current software and performances

Technologies to be used

Java, Spring, iText

Ex Machina Sagl

Website	https://exmachina.ch/
Contact	Marco Celeri, marco.celeri@exmachina.ch
Number of available positions	1
Address	Quartiere Maghetti 20, 6900 Lugano
Mode of Work	In Presence
Languages Requested	Italian
Previous Field Project Atelier SA5 participation	2014, 2016, 2017, 2018, 2019, 2020, 2021, 2023

Company Description

Centro di competenza per le tecnologie open source, cloud computing, blockchain. Dal 2005 serviamo aziende multinazionali e pubbliche amministrazioni in Svizzera e all'estero.

Project Title

AI.lab

Project Description

- automatizzazione delle procedure di calcolo accuratezza dei modelli LLM, anche per confrontare tra loro diverse opzioni
- selezione modelli LLM pre-trained per scopi specifici (audio-to-text, embedding, video-to-text, doc-QA, etc)
- sviluppo processi per esporre tramite API REST le funzionalità dei modelli pre-trained.
- fine-tuning modelli per scopi specifici

Technologies to be used

python, java, LLM

the project objective could change over time

Likex Ltd (UK)

Website	www.likex.io
Contact	Alfredo Villa, Marco Caputo
Number of available positions	2
Address	128 City Road, London (Field Project Address: Piazza della Riscossa 16, 6900 Lugano)
Mode of Work	To be defined
Languages Requested	English
Previous Field Project Atelier SA5 participation	None

Company Description

The company owns a Crypto Exchange, a Wallet and payment Card. So, like anyone else. But he has created the LIKEX index, that allows to give a dollar value to intangible assets, like reputation, following, feeling. Based on that the company has created a set of new asset classes to be traded. The Mirror Token, The Versus Pair, the Long bet We are now at the stage to develop this innovative asset classes and we are looking to one of your student to help us in this venture

Project Title

New Asset Classes in Crypto Trading

Project Description

Likex Ltd is a UK company just formed to develop a Crypto Exchange, a Wallet and a Visa payment card.
All the above, that's quite usual in the market, is already done.
Likex was formed to offer to anyone new trading opportunities, in creating new asset classes to be offered to anyone that have an opinion on something.
Likex has then created a Financial Index (called the Likex Index) that allows to give a dollar value to any intangible asset as reputation, following, pleasure, liking, etc, etc.
Having a dollar value will consent, using a blockchain technology, to create innovative asset classes that allows people to trade on Likex Exchange any kind of assets.
We have developed 3 new asset classes:

The Mirror Token (that allows to shorting any token)
The Versus Pair (that allows to trade the competition between to comparable assets i.e. Apple Vs Android, Mc Donal Vs Burger King, etc, etc)
The Long bet Pair (that allows to trade any future event with pricing estabilished by the traders themselves)

All the above is really innovative and we are looking to have up to 2 student to help developing this new trading opportunities.

Technologies to be used

we are using in white lable Hollaex technology. Here you find more information about it https://docs.hollaex.com/

You can start looking to the drafted website. Everiting wil be online (exchange included) in the next 30 days. https://dpalladino1990.wixsite.com/likex

Mondo Software

Website	https://www.mondosoftware.info/
Contact	Gualtiero Bramati gbramati@mondosoftware.ch
Number of available positions	2
Address	Via Vincenzo D'Alberti 4, 6830 Chiasso
Mode of Work	Hybrid (50% in presence and 50% remote)
Languages Requested	Italian and English
Previous Field Project Atelier SA5 participation	None

Company Description

We are an IT consulting company that follows both projects at clients' premises and customizations of our products.

Project Title

Uso di strumenti intelligenti a supporto della logistica

Project Description

Utilizzare strumenti e tecniche di intelligenza artificiale e sistemi esperti per il miglioramento delle performance nell'organizzazione del magazzino logistico e nell'ottimizzazione delle distribuzioni.
I processi coinvolti in ambito di gestione del magazzino logistico (WMS) sono la gestione dinamica delle ubicazioni in fase di ricevimento, stock e rifill e l'ottimizzazione dei processi di prelievo.
I processi coinvolti in ambito distributivo (TMS) sono l'ottimizzazione del routing di raccolta/consegna e ottimizzazione del carico mezzo.

Technologies to be used

IBM i, .net, web application

Tecnologie AI da definire

Purest Ltd

Website	www.purest.com
Contact	Patrick Garbini, Founder & Managing Director, patrick.garbini@purest.com
Number of available positions	2
Address	Via Pietro Capelli 2
Mode of Work	Hybrid (50% in presence and 50% remote)
Languages Requested	English
Previous Field Project Atelier SA5 participation	None

Company Description

Purest is a luxury fashion label established in Switzerland in 2011 as a family company dedicated to high quality cashmere accessories. We specialize in Private Labels and Luxury Corporate Gifts, providing bespoke collections to top-class clients around the world. PUREST's items are also available in selected stores and on our digital flagship boutique at www.purest.com .

Project Title

Development of an Agile and AI-Enhanced Pricing and Cost Optimization Tool with Natural Language Interactivity

Project Description

We are initiating a university project aimed at developing a dynamic and strategic tool designed for the efficient calculation, assessment, and comparison of our product costs and pricing strategies. This tool will empower our company to streamline the pricing process for new products, enhancing our responsiveness to market opportunities and bolstering our competitive edge.

Key Features and Expectations:

- User-Centric Design: The tool should feature an intuitive and visually appealing interface, ensuring ease of use and accessibility.

- Technological Innovation: Students will be responsible for selecting and implementing the most suitable backend technologies that align with the project's objectives. This includes the development of a robust database capable of interfacing seamlessly with generative AI technologies to support natural language querying, enhancing the tool's interactivity and user engagement.

- Advanced Analytics: In its subsequent phase, the tool should incorporate a comprehensive dashboard to facilitate detailed comparisons of costs and pricing, drawing on historical data, product types, customer profiles, and distribution channels and markets.

- AI-Enhanced Interactivity: The database should be developed to work in conjunction with generative AI, enabling the system to raise and answer questions in natural language. This will facilitate a more intuitive interaction, allowing users to make complex queries and receive insights in an easily understandable format.

- Collaborative Development: Participants will engage closely with the company's Managing Director, ensuring the tool's functionality and user experience meet our high standards.

Student Profile:

We are seeking one or two highly motivated students, regardless of gender, who embody a keen analytical mind, a robust entrepreneurial spirit, and a positive, can-do attitude. Ideal candidates should be adept at navigating complex challenges, driving innovation, and approaching tasks with enthusiasm and a solution-oriented mindset.

Rewards:

Successful completion of the project, delivered on time and to our quality standards, will be rewarded with a monetary prize of 1'000 CHF and a select item from our product range.

This project offers a unique opportunity to contribute to a tangible business solution for a small and dynamic family company with real-world impact, providing invaluable experience in the intersection of technology, business, and innovation.

Technologies to be used

Students will be responsible for selecting and implementing the most suitable backend technologies that align with the project's objectives, with a specific focus on ensuring compatibility with generative AI for enhanced natural language processing capabilities.

For more information contact Patrick Garbini (091 970 16 30 or patrick.garbini@purest.com)

RR Engineering SA

Website	https://www.norsital.com
Contact	Paolo Bellezza Quater paolo.bellezza@protonmail.ch
Number of available positions	1
Address	Via Aeroporto 4 6527 Lodrino
Mode of Work	To be defined
Languages Requested	Italian and English
Previous Field Project Atelier SA5 participation	None

Company Description

Innovative Leader in UAS Solutions Specializing in 360° integrated UAS Working closely with clients across various sectors to develop products, services, and international cooperations. Our team's 20 years track record of excellence in the UAS industry. Multi-Domain Expertise to meet specific customer needs in challenging scenarios

Project Title

development of HMI application for UAV

Project Description

The student at RREngineering SA will study and start to develop a ground HMI application for UAV.
The application should be user friendly and should follow the client and EASA requirements.
The purpose is to identify the functions needed and develop a prototype, an initial kernel, of such an App to be used in real applications.
The student will be guided in order to interact with experts and with the UAV manufacturer to examine the useful monitoring and information functions to be included in the App.
For instance on the App, similarly as on Ground Control Station, user should be able to switch from one sensor to another and verify the data acquisition by each sensor, to monitor the UAV flight status and perform a pre-flight check list. Moreover, the user will be able to download the log files from the performed flights.

The student will be able to test the application by remotely connecting with the UAV manufacturer and/or at Lodrino airport.

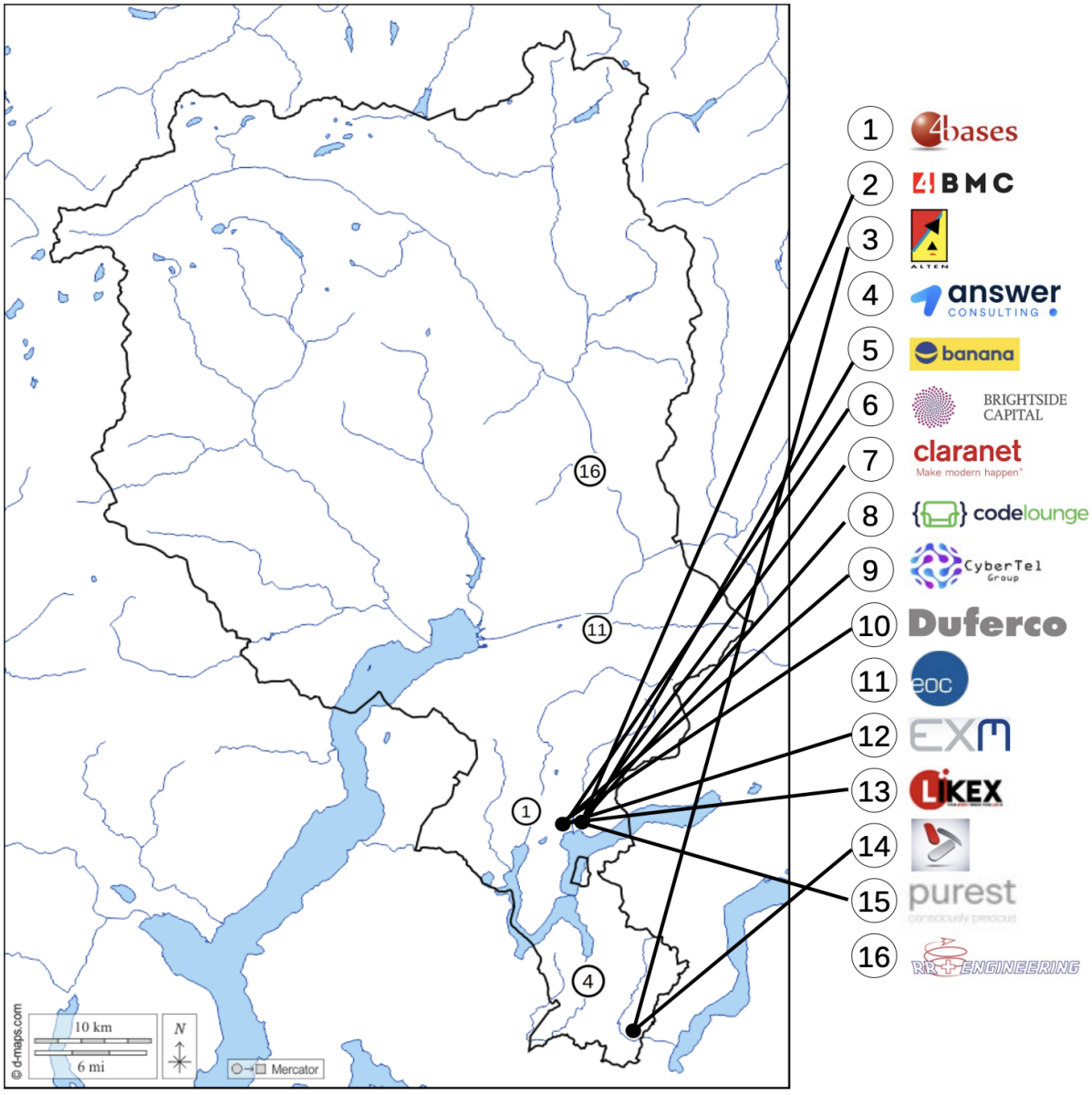
Expected output from the HMI application:
Shows the radio link connection between the UAV and ground control station
Shows the position of the UAV on the map when armed and disarmed
• Shows different UAV data
• Allows to choose between different payload
• Outputs payload data (video stream or measurements)
• Ability to download log files
Ability to change parameters
Interact with remote pilot Ground Control Station (i.e. preflight check , payload situation, landing area status …)

Technologies to be used

Required programming skills:
C/C++
Python
HMI design
HTML
Java Script

Nice to have:
• QGroundControl knowlegde
• PX4 knowlegde
Willing to work with UAVs

Companies Location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codelounge
CyberTel
Group
Duferco
eoc
EXM
LIKEX
purest
ENGINEERING