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DeCAIR NEWSLETTER

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Developing Curricula for Artificial Intelligence and Robotics

2021- 2024

Project Facts

Type: Erasmus+ Programme

Grant Holder: The University of Jordan (UJ)

Duration: Three Years

Start Date: 15th January 2021

UNDER "ERASMUS+ CAPACITY BUILDING IN THE FIELD OF HIGHER EDUCATION"

Project Profile

DeCAIR is a three-years project that started on the 15th of January 2021 and is co-funded by the Erasmus+ programme of the European Union. It is coordinated by The University of Jordan (UJ) with 10 Jordanian, Lebanese, and European partners. The DeCAIR project aims to develop a new MSc program in artificial intelligence and robotics (AIR) at the University of Jordan, a new BSc program in Intelligent Systems Engineering at Tafila Technical University (TTU) and introduce and upgrade AIR courses in the current BSc and MSc programs at the partner Jordanian and Lebanese universities.

The project builds capacities in AIR through transfer of European expertise, academia and industry networking, development of new laboratories in AIR, and strengthening cooperation with local, regional, and European companies to apply AIR technologies.

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Aims and Specific Objectives of the Project

Recently, artificial intelligence and robotics (AIR) have been making huge advances enabling them to enter new applications, constituting disruptive forces to various aspects of our lives. Developing countries such as Jordan and Lebanon suffer from slowing economies and high unemployment rates. These problems will worsen as AIR technologies succeed in automating more jobs and shifting production and jobs to the countries that employ these technologies to efficiently offer better services and products. Therefore, it is essential for all countries to engage in using and developing these technologies to create new businesses, improve existing products and services, and foster human prosperity. The consortium of this proposal is taking the initiative of "*Developing Curricula for Artificial Intelligence and Robotics (DeCAIR)*"; a project that intends to develop curricula in the areas of AIR through new master's and bachelor programs. These programs will give students opportunities to specialize in AI technologies, Robotics technologies, or using AI solutions to develop smart and autonomous robots that can solve unconventional problems. Additionally, DeCAIR will improve the curricula of existing masters and bachelor programs in the areas of AIR, establish relevant modern laboratories, and implement modern teaching methods such as flipped learning and project-based learning. All this will improve the graduates' practical skills and enable them to exploit these revolutionary technologies to solve local and regional problems, create new jobs, and to start new ventures. Other project aims are to improve the teaching capacity at universities of the partner countries, build a network of highly qualified professionals in these areas among partner universities, and improve collaboration with local and regional industries and community for applying AIR technologies in solving industry and community problems.

Partners

P1	 <p>The University of Jordan (UJ), Jordan (Project General Coordinator)</p> <p>Contact Person: Prof. Gheith Abandah</p>	P6	 <p>Università di Pisa (UNIPI), Italy</p> <p>Contact Person: Dr. Lucia Pallottino</p>
P2	 <p>Jordan University of Science and Technology (JUST), Jordan</p> <p>Contact Person: Prof. Wafa Batayneh</p>	P7	 <p>Università degli Studi di Genova (UNIGE), Italy</p> <p>Contact Person: Prof. Francesco Masulli</p>
P3	 <p>Tafila Technical University (TTU), Jordan</p> <p>Contact Person: Dr. Murad Alaqtash</p>	P8	 <p>Universidad de Granada (UGR), Spain</p> <p>Contact Person: Prof. Jorge Casillas</p>
P4	 <p>Lebanese University (LU), Lebanon</p> <p>Contact Person: Prof. Clovis Francis</p>	P9	 <p>University of Stuttgart (UST), Germany</p> <p>Contact Person: Dr. Peter Eberhard</p>
P5	 <p>Beirut Arab University (BAU), Lebanon</p> <p>Contact Person: Prof. Soubhi Abou-Chahine</p>	P10	 <p>Creative Thinking Development (CRE.THI.DEV), Greece</p> <p>Contact Person: Dimos Papakonstantinou</p>

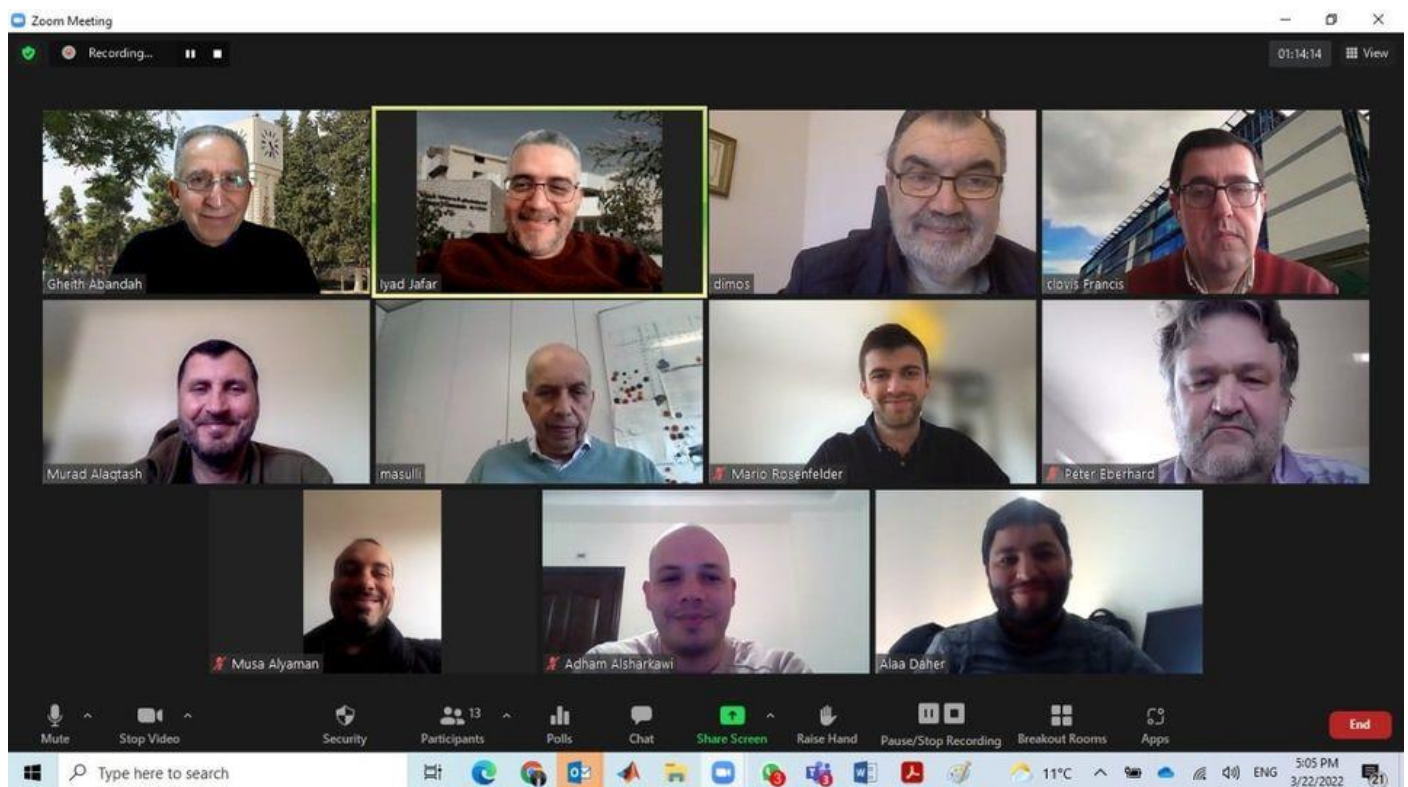
DeCAIR Steering Committee Meetings

As part of WP13, the steering committee meets almost monthly or bimonthly. Since the project start, there has been 13 steering committee meetings. The majority of which were held online, and after COVID19 travel restrictions were lifted, the most recent meetings were held in hybrid mode (in-person and online). The following are some highlights of these recent meetings.

Eleventh Meeting (March 22nd, 2022)

On Tuesday 22/3/2022, the 11th DeCAIR Steering Committee meeting was held virtually via Zoom. The following topics were discussed during this meeting:

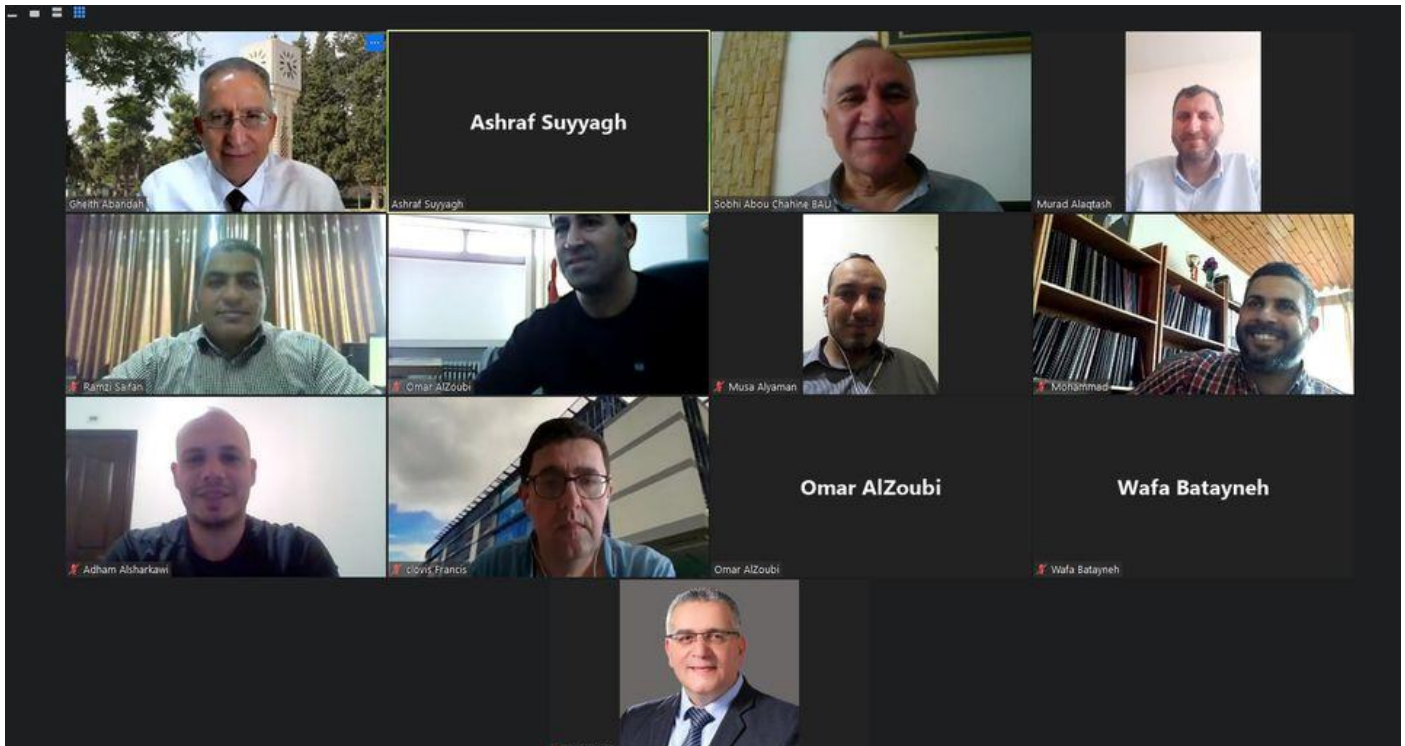
- Status review and planning for the following work packages:
 - * WP7: Building capacity in AIR in universities of Partner Countries
 - * WP8: Establishing and developing AIR labs
 - * WP10: Quality Assurance
 - * WP11: Collaboration with industry and community
- Status of approving changes of updated MSc and BSc programs
- Scheduling the next SC meeting



DeCAIR Joint Meeting between Jordanian and Lebanese Partners

On Tuesday 26/4/2022, the DeCAIR partners from Jordan and Lebanon held a virtual meeting via Zoom. The following topics were discussed during this meeting:

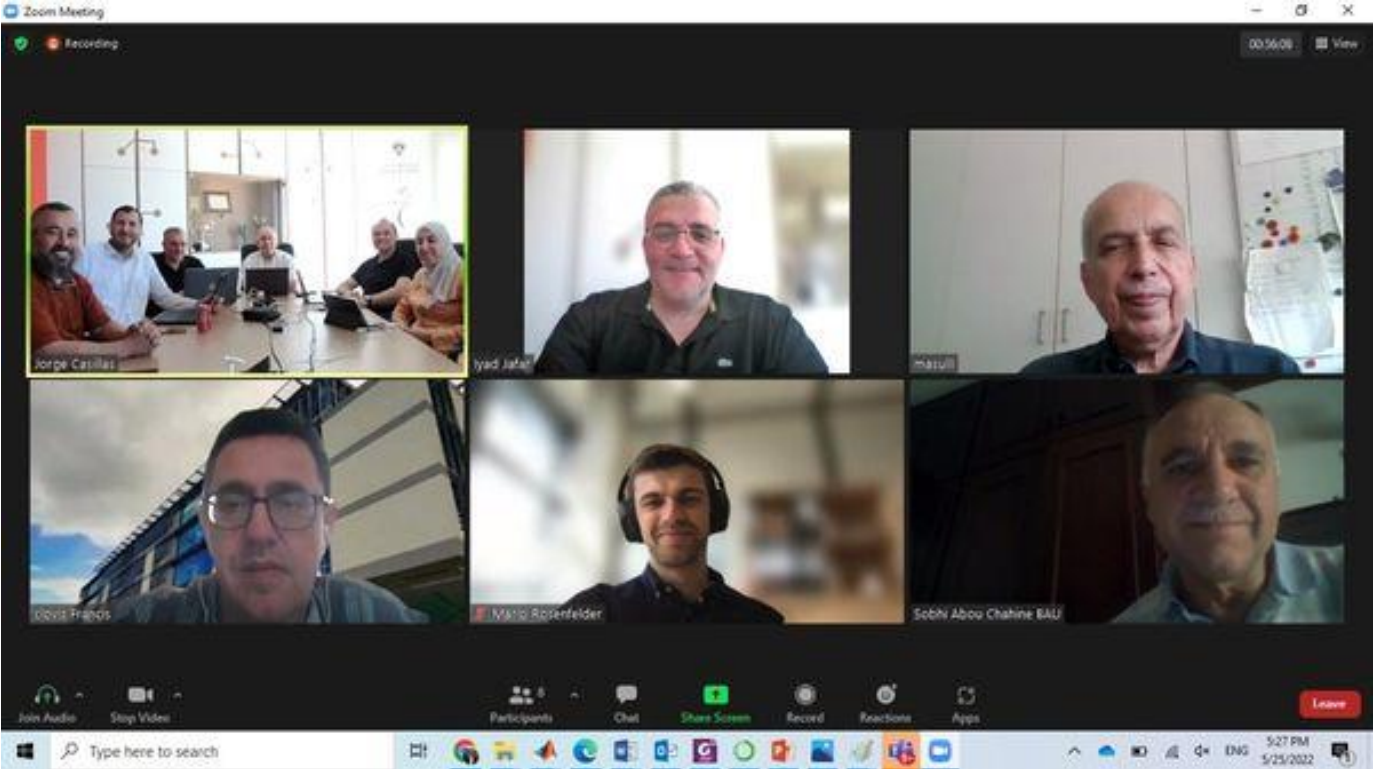
- Status review and planning for the following work packages:
 - * WP7: Building capacity in AIR in universities of Partner Countries and organizing the next set of technical workshops in the field of AI and Robotics
 - * WP8: Establishing and developing AIR labs and the status of each tender and procurement of equipment.
- Status of approving changes of updated MSc and BSc programs



Twelfth Meeting (May 25th, 2022)

On Tuesday 25/5/2022, the 12th DeCAIR Steering Committee Meeting was held in-person at the University of Granada / Spain during the DeCAIR Team visit, and also it was held virtually via Zoom. The following topics were discussed during this meeting:

- Status review and planning for the following work packages:
 - * WP7: Building capacity in AIR in universities of Partner Countries
 - * WP10: Quality Assurance
 - * WP11: Collaboration with industry and community
- Scheduling the next SC meeting



Thirteenth Meeting (July 7th, 2022)

On Wednesday 13/7/2022, the 13th DeCAIR Steering Committee Meeting was held in person at the University of Genoa / Italy during the DeCAIR Team visit, and it was also held virtually via Zoom. The following topics were discussed during this meeting:

- Status review and planning for the following work packages:
 - * WP3: Implementing the new MSc program in UJ which was recently approved, accredited, and set to start in Fall 2022.
 - * WP4: Implementing the new BSc program in TTU
 - * WP5: Improving curricula of current MSc programs in JO and LB
 - * WP6: Improving curricula of current BSc programs in JO and LB
 - * WP7: Building capacity in AIR in universities of Partner Countries
 - * WP8: Establishing and developing AIR labs
 - * WP10: Quality Assurance
 - * WP12: Results dissemination
- Scheduling the next SC meeting in Stuttgart, Germany.



DeCAIR Activity Highlights

DeCAIR Gives a Presentation for Jordan Design and Development Bureau (JODDB)

Sunday March 20th, 2022: As part of the DeCAIR project dissemination program, Prof. Gheith Abandah was invited by Jordan Design and Development Bureau (JODDB) to give a presentation titled “Modern Artificial Intelligence and Machine Learning.” This 2-hour presentation was delivered in the JODDB offices in Al-Dlail for more than 20 JODDB engineers. The presentation covered the following topics:

- Introduction to Artificial Intelligence and Machine Learning
- Artificial Neural Networks
- Achievements of Contemporary Artificial Intelligence
- Deep Learning for Serving the Arabic Language
- Limitations of Contemporary Artificial Intelligence
- AI Future
- DeCAIR Project: Developing Curricula for Artificial Intelligence and Robotics



Establishing and Reinforcing the Collaboration between Industry and Academia Workshop

Thursday March 31st, 2022: The International Affairs Unit (IAU) and the School of Engineering at the University of Jordan organized a workshop entitled “Establishing and Reinforcing the Collaboration between Industry and Academia” as part of the activities of the project to develop curricula for artificial intelligence and robotics (DeCAIR) funded by the European Union within the Erasmus Plus programme.

The one-day workshop, which was inaugurated by the Vice President for Academic Colleges Affairs, Prof. Inam Khalaf, included topics related to establishing and strengthening cooperation between industry and academia in the field of artificial intelligence and robotics, in which academics, company owners and experts from Jordan, Lebanon and European countries participated.

During the inauguration of the workshop, Khalaf affirmed the university's support, as part of its strategy, for the efforts to develop relations with external parties that support scientific research and capacity-building, offering joint graduate programs with international universities and international institutions, and exchanging experiences and knowledge globally, stressing the importance of strengthening the relationship between industry and academia.

The founder of the Italian company "Joint", Dr. Manuel Catano, spoke about soft robotics technologies, and the CEO of Al-Jawdah Company for Business Solutions, Mr. Ahmed Abu Qaoud, pointed out the role of skills development in providing job opportunities, while the Director of the Faculty for Factory (FFF) project at the university, Prof. Youssef Al-Abdallat, talked about ongoing efforts to link educational institutions with the industry sector.

According to the project's general coordinator, Prof. Gheith Abandah, the (DeCAIR) project is implemented under the leadership of the University of Jordan and aims to develop a new master's program in artificial intelligence and robotics (AIR - Artificial Intelligence and Robotics) at the University of Jordan, and a new bachelor's program in intelligent systems engineering at Tafila Technical University. It also introduces new AIR courses for current bachelor's and master's programs at Jordanian and Lebanese partner universities. The project is based on building AIR capabilities by transferring European expertise, academia and industrial networks, developing new AIR laboratories, and enhancing cooperation with local, regional and European companies to implement AIR technically.



DeCAIR at the Robottia Event (University of Jordan)

Monday March 28th, 2022: The IEEE Robotics and Automation Society - University of Jordan Section (IEEE RAS-UJ) held the Robottia event at the School of Engineering. The event featured talks from the local industry developing UAVs and Vehicular robots, as well as students sharing their experience in building up their own robots, the international robot competitions they competed in and their achievements. During the event, and as part of the DeCAIR project dissemination, Dr. Mohammad Mashagbeh (Mechatronics Department) and Dr. Ashraf Suyyagh (Computer Engineering Department) talked about the recent changes to the B.Sc. curricula in both departments and the courses that will help students start with designing and working with robots. Dr. Mashagbeh also talked about the new joint Master's program in Artificial Intelligence and Robotics between the Mechatronics and Computer Departments. Dr. Suyyagh also briefly spoke about and introduced the DeCAIR program, its goals, partners, and recent achievements.



DeCAIR at Orange Digital Village

Tuesday April 12th, 2022: The DeCAIR project visited Orange Digital Village to discuss possible cooperation between the project and the units within this village. The Digital Village, a hub for innovation and creativity, includes the Orange Coding Academy, Fablab, the Innovation Space, a joint project with the European Union, and FATE eSports, a facility for e-games training. The Digital Village is home to the Orange programs that provide financial, technical, marketing support, mentorship, and training to prepare qualified young entrepreneurs and future leaders that make a positive impact on their community.

The visit included briefing by Prof. Gheith Abandah about the DeCAIR project and presentations by teams of Orange AI Incubator. The visit also included a tour in Orange AI Incubator, Orange Business Innovation Growth accelerator, and Orange Foundation FabLab.



DeCAIR Meeting UJ President

Thursday 28th April, 2022: The DeCAIR project represented by the project head Prof. Gheith Abandah met the University of Jordan's President (Prof. Nathir Obeidat), Vice President for Scientific Schools (Prof. Inaam Khalaf), Dean of the School of Engineering (Prof. Naser Al-Huniti), Deputy Dean of the School of Engineering for Academic Affairs (Prof. Bashar Tarawneh), Chair of the Computer Engineering Department (Dr. Mohammad Abdel-Majeed), and Chair of the Mechatronics Engineering Department (Dr. Osama Al-Habahbeh).

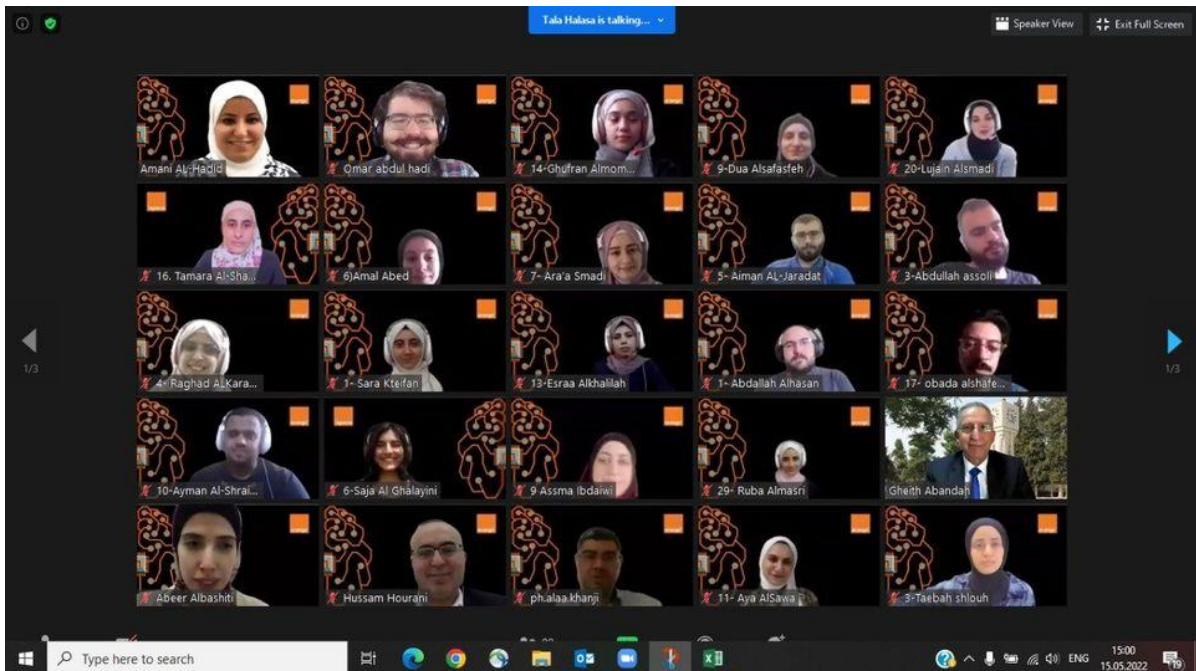
Prof. Gheith Abandah started by giving an overview of the DeCAIR project, its objectives, main results, and status. The meeting included a thorough discussion about the project challenges by the entire meeting participants. The President emphasized the importance of this project for the University of Jordan and assured that the university gives it its full support. The President also suggested ideas to increase the project's impact in the University of Jordan.



DeCAIR Gives a Presentation in Jordan Orange's "Day of AI"

Sunday 15/5/2022: As part of the DeCAIR project dissemination program, Prof. Gheith Abandah was invited by Orange AI Incubator of Orange – Jordan to give a presentation titled "AI: History and Modern Applications" as part of their 2-hour event titled "Day of AI." This 45-minute presentation was delivered through Zoom platform for more than 90 participants. The presentation covered the following topics:

- Introduction to Artificial Intelligence and Machine Learning
- History
- Computer Vision
- Natural Languages Processing
- DeCAIR Project



DeCAIR Training Workshop on Advanced Data Science at the University of Granada

May 23 – May 27, 2022: The University of Granada / School of Technology and Telecommunications Engineering, a leading world university in data science and artificial Intelligence, and a key partner of the DeCAIR project held an extensive training workshop on advanced data science topics at the university campus in Granada, Spain. The training workshop was specifically held for faculty members who attended from the University of Jordan (UJ), Jordan University of Science and Technology (JUST), Tafila Technical University (TTU), Beirut Arab University (BAU), and the Lebanese University (LE) . The workshop was concurrently held online via Zoom to allow other faculty members to attend. The hands-on training included sessions presented by leading scientists in their field covering the following topics:

- Time Series with Python by Prof. Manuel Pegalajar-Cuellar
- Supervised and Unsupervised learning with Python by Prof. Daniel Molina Cabrera
- Learning from imbalanced data with Python by Prof. Alberto Fernández
- Singular learning problems with Python (3h) by Prof. Salvador García
- Data Pre-processing with Python by Mr. Germán González

The workshop focused on hands-on examples and some teaching strategies to transfer knowledge to students.



The DeCAIR Team Visit to CITIC- UGR

Wednesday May 25th, 2022: During the DeCAIR team visit to the University of Granada, the team was invited to visit the Center for Research in Information and Communication Technologies of the University of Granada (CITIC- UGR). The center is a leading research facility where researchers tackle relevant scientific-technological challenges; transfer knowledge to the industrial sector, and train researchers who are engines of socio-economic growth around new technologies. The center is directly connected to incubators and the local industry.

During the visit, Mr. Germán González invited the team to see the advanced computer and server clusters where most AI and machine learning research is conducted, offering explanation about their capacity, technical specifications, and the type of research conducted using these servers.



Social activities during the DeCAIR team visit to the University of Granada

Thursday April 26th, 2022: The University of Granada hosted the DeCAIR Team at the garden of the Carmen de la Victoria. The gardens are owned and managed by the University of Granada, and they are situated on a hill overlooking the Al-Hambra Palace Complex. The soiree was organized by Prof. Jorge Casillas where the DeCAIR team members met their peers and workshop instructors. During this social event, attendees got to know more about the research they conduct, and exchanged info about Spain, Jordan, Lebanon, the similarities and differences between their cultures, customs, and history.

Also, Prof. Jorge Casillas organized a one-day guided tour and visit to the Al-Hambra Palace complex for the DeCAIR team visiting Granada and some UGR faculty members.



Joint DeCAIR, NVIDIA Deep Learning Institute, and IEEE Jordan Workshop

Monday May 30th, 2022: The DeCAIR Project in cooperation with NVIDIA Deep Learning Institute, and Jordan Joint Chapter of the IEEE Computer Society and Computational Intelligence Society held a workshop entitled Fundamentals of Deep Learning. The workshop was given by NVIDIA Learning Institute Ambassador Dr. Manal Jalloul (American University of Beirut "AUB") where the following topics were covered:

- Fundamental techniques and tools required to train a deep learning model,
- Common deep learning data types and model architectures,
- Enhancing datasets through data augmentation to improve model accuracy
- Leveraging transfer learning between models to achieve efficient results with less data and computation.

The training workshop took place at the School of Engineering Labs / University of Jordan and it was also available online through Zoom for both students and faculty.



First IEEE CS-DeCAIR Workshop on AI: Hardware Acceleration

Monday May 30th, 2022: DeCAIR in partnership with IEEE - Jordan Section and Jordan Joint Chapter of the IEEE Computer Society and Computational Intelligence Society held a workshop on hardware acceleration for artificial intelligence applications. The main purpose of the event was to raise the awareness of AI-related research and applications among the IEEE Computer Society members and the academic community.

During the event, Prof. Gheith Abandah gave a presentation about the DeCAIR project, its aims, goals, partners, programs, and activities. Dr. Manal Jalloul was a guest keynote speaker from the American University of Beirut (AUB) and an NVIDIA Learning Institute ambassador who presented an exciting talk entitled "NVIDIA's AI Ecosystem: How AI is Brought to Life by NVIDIA". In her talk, Dr. Jalloul presented NVIDIA 's ecosystem of hardware and software tools in artificial intelligence.



DeCAIR gives a Presentation at the 14th Conference of the School of Dentistry at the University of Jordan

Thursday 23/6/2022: As part of the DeCAIR project dissemination program, Dr. Mohammad Abdel-Majeed was invited by the school of dentistry at the University of Jordan to give a presentation titled “Artificial Intelligence in Dentistry” as part of their 2-Day event. The presentation covered the following topics:

- Introduction to Artificial Intelligence and Machine Learning
- How to apply AI in Dentistry
- Brief overview about three joint projects between faculty members at the Computer Engineering Department and the school of Dentistry.
- Overview of the most recent changes in the study plan to foster the AI component as part of the DeCAIR Project.



DeCAIR Training Workshops on Deep Learning and Computer Vision

July 12 – July 20, 2022: The University of Genoa / Department of Informatics, Bioengineering, Robotics, and Systems Engineering - a key partner of the DeCAIR project - held two training workshops on deep learning and computer vision at the university campus in Genoa, Italy. The training workshops were held for the DeCAIR team as well as PhD students hailing from many universities across Italy and abroad. Members of the DeCAIR team from the University of Jordan (UJ), Jordan University of Science and Technology (JUST), Tafila Technical University (TTU), Beirut Arab University (BAU), and the Lebanese University (LE) were in attendance. The workshop was concurrently held online via Zoom to allow other faculty members and students to attend. The hands-on training included sessions presented by leading scientists in their field covering the following topics:

- Introduction to NNs, CNNs, Autoencoders, GANs, RNNs, and Transformers given by Nicoletta Noceti.
- Introduction to computer vision, digital signals and images, image filters and features, CNNs for image classification, and motion/depth estimation given by Prof. Francesca Odone.

The workshop focused on hands-on examples and exercises with dedicated daily lab sessions.



DeCAIR general project coordinator visit to the University of Pisa

July 25, 2022: As part of the DeCAIR project activities, the general project coordinator, Prof. Gheith Abandah, visited the University of Pisa. Prof. Lucia Pallottino led a tour in the labs of Centro di Ricerca "E. Piaggio" Dipartimento di Ingegneria dell'Informazione.

Prof. Lucia Pallottino and her team demonstrated their achievements and research in developing soft robots. Prof. Abandah and Dr. Pallottino also discussed the plans for the capacity building work package of the project and future training courses in Jordan and Lebanon.



Upcoming Events

September 2022

DeCAIR Info Day at Tafilah Technical University

Tuesday September 6th, 2022: the Tafila Technical University (TTU), a key local partner in the DeCAIR project will hold an Information Day about the DeCAIR project at TTU campus in Al-Tafila, Jordan.

Opening Ceremony of the New MSc program in AIR at UJ

Thursday September 8th, 2022: Under the patronage of HE Prof. Nathir Obeidat, the new MSc program in Artificial Intelligence and Robotics at the University of Jordan will be officially launched, in an opening ceremony that will be covered by local media and news outlets.

Robotics Training Course in Stuttgart, Germany

September 21st to September 23rd : A practical training course on various robotics topics is scheduled to take place at the University of Stuttgart. The training course comprises multiple modules related to 'Mobile Robot Motion Control', 'Robot Kinematics (Articulated Robot)', 'Balanced Ball on Rim' and 'Regulation of a Spherical Pendulum'.

Steering Committee Meeting

Wednesday September 21st, 2022: DeCAIR will hold its fourteenth steering committee meeting, in Stuttgart, Germany.

October 2022

The new MSc program in Artificial Intelligence and Robotics Accepts its First Students

Sunday October 9th, 2022: The newly developed MSc program in Artificial Intelligence and Robotics at the School of Engineering / UJ will accept its first students in Fall of the academic year 2022 / 2023. The program will initially accept 15 students and has been developed through the DeCAIR project with partnership with various European universities. The new master's program provides high-quality academic courses and labs that enable students to get a hold on the rapid technological developments. The students benefit from the advancing computer capabilities in designing and developing innovative, reliable, and sustainable technical solutions for practical problems facing all aspects of today's world. The program provides the various sectors of the regional and global markets with qualified graduates in these fields.

New updated BSc courses related to AI and Robotics Offered

Sunday October 9th, 2022: The new updated BSc courses related to AI and Robotics that have been developed, revised, and updated will be offered in all partner universities in Jordan and Lebanon.

February 2023

Robotics Training Course in Amman, Jordan given by University of Pisa Instructors

Sunday February 19th: 2023: Dr. Lucia and Eng. Manuel Catalano from the University of Pisa will deliver a course titled "*Fundamentals of Robotics*" in Jordan. The course topics include kinematics and dynamics (manipulators, parallel robots, and vehicles), inverse kinematics and numerical aspects, sensors and actuators, and principles of robot design.

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