



DSSE NEWSLETTER

UPDATES ON THE YEAR AUG 2021- DEC 2022

DHANANI SCHOOL OF SCIENCE AND ENGINEERING

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Picture by: Marium Jamal

ASSISTANT DEAN'S MESSAGE

I am delighted to share with you some not-very-latest-but-definitely-greatest activities at the Dhanani School of Science and Engineering in this edition of the DSSE newsletter that covers the period of August 2021-December 2022. The intention of the newsletter is threefold:

- To share updates within the HU community
- To highlight achievements and areas of collaboration with the industry
- To demonstrate exciting developments showcasing the commitment to excellence to donors and the international community



As we approach the end of this cycle, I want to take a moment to reflect on the incredible achievements of our community. Despite the unprecedented challenges we have faced over the past year and a half, with partial online and on campus classes to finally being back in-person completely, I am glad we have continued to demonstrate our resilience, creativity, and commitment to Yohsin. Our faculty members and staff are among the best and brightest in their respective fields, and they are dedicated to providing our students with an exceptional learning experience. We are also proud of our students, who are the lifeblood of our school. They are creative, ambitious, and driven, and they bring a diversity of perspectives and experiences that enrich our community.

In this issue, you will find articles highlighting some of the happenings across our university, including innovative final year research projects, inspiring student success stories, the introduction of the Bioscience minor and - as the first female Assistant Dean - some new initiatives directed at promoting Women in STEM through outreach activities and panel discussions.

I encourage you to look for some new ventures that are planned for the near future in the next issue, such as, the first Dhahani School of Science and Engineering - Undergraduate Research Symposium (DURS2023) which is planned for 16th May 2023 AND the finals of Invent for the Planet (IFTP) at Texas A&M on 20th April 2023 where our very own HU team has made it to the top 6 finalists.

My special thanks to **Dr. Waqar Saleem** for his guidance with the newsletter and to **Muhammad Shoaib Khurshed** who singlehandedly and diligently put everything together with a bright smile. Thank you to all of DSSE for your continued support, and we look forward to celebrating our many successes together in the coming years.

Dr. Humaira Qureshi,
Assistant Dean, Associate Professor, DSSE



A representation of community spirit, the DSSE Annual Dinner held in May 2022

EDITOR'S NOTE

I started working for this newsletter as a means to put my creative skills to use, but little did I know I would be completely immersed and obsessed with it. This obsession lies not with the words and pictures on these pages, but the wholeheartedness of our DSSE community that played an integral part in helping me put together this newsletter. The most astounding aspect of my work came with the realization of empathy and kindness. How my professors came through, never second questioned me and were actually really excited to help me get the relevant information required for this project.

This Newsletter is dedicated to the entire DSSE community. From the Lab Assistants that worked hard to get me pictures for events, the professors who worked tirelessly with me to provide me content and counsel me at every turn, the TCT staff that was kind to me every time I wanted to be cared for and the student body who gave me all they could in their expertise to help complete my work. I genuinely hope you have as much fun reading this newsletter as I had making it.

**- Muhammad Shoaib Khursheed
(CS, Batch of 2025)**



FACULTY PROMOTIONS



Dr. Sameena Shah Zaman, Promoted from Assistant Professor to Associate Professor, Integrated Sciences and Mathematics, Dhanani School of Science and Engineering

Dr. Shah Zaman is a Physicist with excellent research credentials. As a teacher, she constantly explores new pedagogical methods to make student learning at the center of her teaching. She is recognized by colleagues for teaching a wide range of courses.



Dr. Syeda Saleha Raza, Promoted from Assistant Professor to Associate Professor, Computer Science, Dhanani School of Science and Engineering

Dr. Raza has been associated with the Computer Science Program for almost six years and has been an inspiring teacher, and a role model for many female students aspiring a career in STEM in general



Dr. Ishtiyaq Makda, Promoted from Assistant Professor to Associate Professor, Electrical and Computer Engineering, Dhanani School of Science and Engineering

Since his joining five years ago, Dr. Makda, has been an exceptional teacher and a very committed community member. He manages the Engineering lab facilities for the university. He also chairs the Laboratory Committee for the ECE program.



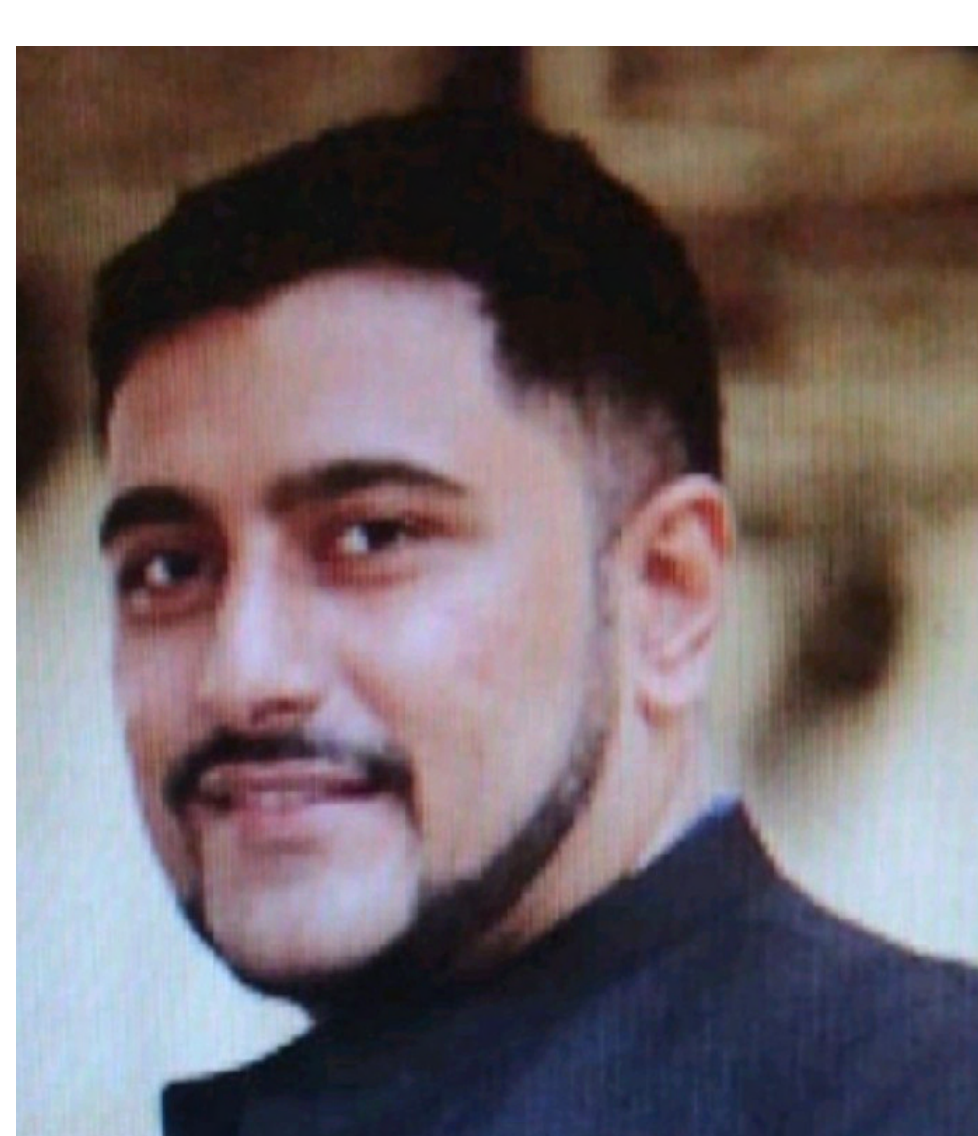
Mr. Tariq Mumtaz, Promoted from Lecturer I to Lecturer II and then to Assistant Professor, Electrical and Computer Engineering, Dhanani School of Science and Engineering

Mr. Mumtaz joined Habib University in 2016. He is an outstanding teacher and brings his wealth of industry experience in the classroom. He has played an active role in the ECE Capstone Committee, which he has chaired for two years.



Mr. Yousuf Kerai, Promoted from Lecturer to Senior Lecturer, Comparative Humanities and Integrated Sciences and Mathematics

An excellent Math teacher, and with exceptional talent in music, Mr. Kerai has been instrumental in developing inter disciplinary courses at Habib University. He is the founding Director of the Center for South Asian Music and has led the development of South Asian Music minor.



Dr. Mohammad Moiz Anis, Promoted from Assistant Professor to Associate Professor, Computer Sciences, Dhanani School of Science and Engineering

Dr. Anis has been associated with the University since 2017 and has demonstrated exceptional service to the institution. He has led the DSSE Public Lecture Series for two years – organizing over 40 lectures, both in-person and online.

JOINING MEMBERS:

DSSE WELCOMED THE FOLLOWING NEW FACULTY MEMBERS:

Dr. Muhammad Nadeem

Assistant Professor,
Computer Science

Dr. Sohaib Ali

Assistant Professor,
Computer Science

Dr. Neelma Bhatti

Assistant Professor,
Computer Science

Dr. Farhan Khan

Assistant Professor,
Electrical And Computer
Engineering

Dr. Tariq Kamal

Assistant Professor,
Electrical And Computer
Engineering

Dr. Faisal Alvi

Assistant Professor,
Computer Science

FACULTY PROMOTIONS



**Dr. Humaira Qureshi, Associate Professor,
Integrated Sciences and Mathematics (iSciM),
Dhanani School of Science and Engineering**

Dr. Qureshi has been associated with Habib University since 2016 and has been instrumental in setting up the Biology and Chemistry labs at Habib University. Dr. Qureshi is a Microbiologist and contributes immensely in offering a variety of Scientific methods courses.



**Dr. Abdul Samad, Associate Professor,
Computer Science, Dhanani School of Science
and Engineering**

Dr. Samad had joined Habib University after completing his Fulbright Program in 2018. Dr. Samad teaches a wide range of courses, including some of most sought courses in the fields of Artificial Intelligence and Machine Learning. He integrates research in his courses and encourages students to continue working on their course projects and extend it to publications as a poster or paper.



**Dr. Muhammad Farhan, Associate Professor,
Electrical and Computer Engineering (ECE),
Dhanani School of Science and Engineering**

Dr. Muhammad Farhan had joined Habib University in 2017 and has been an integral part of the ECE program since then. Dr. Farhan is an exceptional teacher and was a winner of the inaugural teaching award at Habib University in 2021. Dr. Farhan also has an admirable record of creating opportunities for undergraduate students to publish their design projects.



**Dr. Muhammad Mobeen Movania, Associate
Professor, Computer Science, Dhanani School
of Science and Engineering**

Prior to joining Habib University in 2020, Dr. Movania had worked with DHA Suffa University for seven years. Dr. Movania has been an exceptional teacher and a very committed community member. He possesses a strong research portfolio with several conference papers, journal publications and book chapters.



**Mr. Junaid Ahmed Memon, Lecturer II,
Electrical and Computer Engineering, Dhanani
School of Science and Engineering**

Mr. Junaid Ahmed Memon joined Habib University as a Lecturer in 2018. He is an outstanding teacher and was also a winner of the inaugural teaching awards in 2021. Mr. Memon has an excellent service record, as part of which he led the ECE lab Committee that reimagined various labs especially during the pandemic.

JOINING MEMBERS:

Dr. Qasim Pasta

Assistant Professor,
Computer Science

Ms. Aatyka Fatima

Dean's Fellows,
Integrated Sciences And
Mathematics

Mr. Haseeb Shaikh

Dean's Fellows,
Electrical And Computer
Engineering

Mr. Mohammad Salman

Dean's Fellow,
Computer Science

Mr. Abdullah Zafar

Dean's Fellow,
Computer Science

Ms. Areeba Rajput

Dean's Fellow,
Electrical And Computer
Engineering



The COVID-19 pandemic had forced Habib University, like many other educational institutions around the world, to switch to online semesters, causing a lot of difficulties for the students. Many found it hard to adjust to the new mode of instruction and the absence of the usual university life experience, which was particularly challenging for the Batch of 2024 and 2025.

In Fall 2021, the university had allowed campus access only to the Batch of 2025 in order to elevate their first-year experience. However, most classes were still held online, which made it difficult for the students to learn effectively. The absence of in-person classes had increased their yearning for campus life and the opportunities it offered.

The arrival of Spring 2022 brought hope for the students as the university announced that 'in person' classes would be resumed. This news was greeted with delight by the students, who were excited to finally be able to study and work in a physical classroom environment again. The campus officially reopened, and students had access to the labs and studios to complete their projects, resulting in better communication, coordination, and efficient working.

For the senior students in the Class of 2022, the reopening was a game-changer as they were able to work more efficiently on their Final Year Projects (FYP). As a result, the Habib community witnessed some of the most exciting and amazing projects, films, and thesis statements produced by the students.

The freshmen in the Class of 2025 and sophomores in the Class of 2024 also had the opportunity to experience their first proper on-campus classes. The DSSE community was back in full throttle, organizing exciting new activities, competitions, and events, including Habib University's first intra-university singing/music competition 'Groove-22' and 'Bayaan's' concert, which drew a huge audience who had a lot of fun participating and spectating.

In Fall 2022, the university welcomed the new Class of 2026, and all classes were finally held fully on campus for the first time since the reopening of the institute after the pandemic. The university had reinstated the biometric attendance system, and lessons continued as per schedule.

The students had learned that learning must continue in every situation and that no circumstance should act as an excuse to derail them from their responsibilities. Although the pandemic had been tough, life had still moved on, and the university community was enthusiastic and passionate about learning and achieving new heights.

Overall, Habib University's campus reopening had brought back the much-needed sense of normalcy and excitement to the student life, allowing them to pursue their academic and extracurricular goals with renewed vigor and enthusiasm.

-By Athar Hashmi (CS, Batch of 2025)

RESEARCH COLLABORATION MEETING WITH KE TEAM

On 18th October 2022, our DSSE faculty (lead by Dr. Tariq Mumtaz) met with KE team members (lead by Head of Network Engineering: Rizwan Ahmed Ansari) to hold a meeting over research collaboration. During the meeting Dr. Tariq Mumtaz gave a brief intro about HU aims and goals towards the research collaboration, explaining how HU wants strong and continuous industry liaisons.

Mr. Rizwan elaborated that in old era academia, industrial liaisons and industry engagements were meant as conventional events (for example: students visit industrial plants to help them make their final year projects) But now industries want to get in touch with faculty members so they can help collaborate with students and come up with real-time solutions to solve industrial problems. He went on to explain how there is a triangle consisting of: the academia, industry and government. He was anticipating NEBRA and their work with COMSAT to develop a software through which industries could be directly linked with academia.

The meeting ended on the conclusion that academic faculties should identify problems for their students to solve. This would help students get their hands on real-time solutions, and help industries have long lasting solutions to problems. KE will support HU in organizing seminars and lectures for students where KE experts will share their experience with the students encouraging a friendly ecosystem where both parties could benefit.

AN INTERACTIVE SESSION ON FINANCIAL WELLBING

YPay, a fintech startup co-founded by Furqan Kidwai that aims to make investing and saving simpler, visited Habib University during golden hour on Nov 10th 2022 at Tariq Rafi Hall for their Financial Wellbeing Program to educate students on how to manage their finances and invest in safer and wiser options during these challenging times using YPay's investing platform.



INDUSTRY EVENTS



SUPARCO EVENT

Habib's DSSE Industry Liaison Team explored potential collaboration with Industries, the objective was to form strong working groups for Industry personnel and Habib University (Faculty & Students). Throughout the year they finalized interesting projects with diverse industries. In this context, SUPARCO technical team (GNSS Group, Satellite Navigation | SUPARCO) visited Habib Campus on 8th Nov 2022 for a project demonstration of "Satellite Navigation and Allied Technologies". They identified different interesting avenues in this project where Habib University & SUPARCO could work together.



INDUSTRY EVENTS

KAAVISH PANEL TALK FOR INDUSTRY ENGAGEMENT

The Kaavish Faculty Committee of the Department of Computer Science at Habib University held a panel discussion on Friday 18 November 2022 from 11:30am-12:45pm at the Tariq Rafi Lecture Hall. The panelists were :

1. Mr. Syed Zeeshan Haider, CEO & Founder - Technology, Services & Digital Management, V8 Digital Solutions
2. Mr. Shoaib-ur-Rehman, Data Science/Big Data Consultant, Virtuosoftware.pk



The talk was moderated by Dr. Mobeen Movania. The title of the discussion was “Taking Your Final Year Project from Project to Product”. The audience of this discussion were final year students who had started their final year project in Fall 2022 semester. Students usually are curious to know more about how to get going with their final year projects, on how to get assistance in terms of incubation to take their project idea forward into a product and how to make a financial model for their product idea. The panel discussion was held to answer student queries

STUDENT COMPETITIONS

INVENT FOR THE PLANET 2022



Invent for the Planet 2022 (IFTP'22) took place from Friday, 18th February 2022, to Sunday, 20th February 2022.

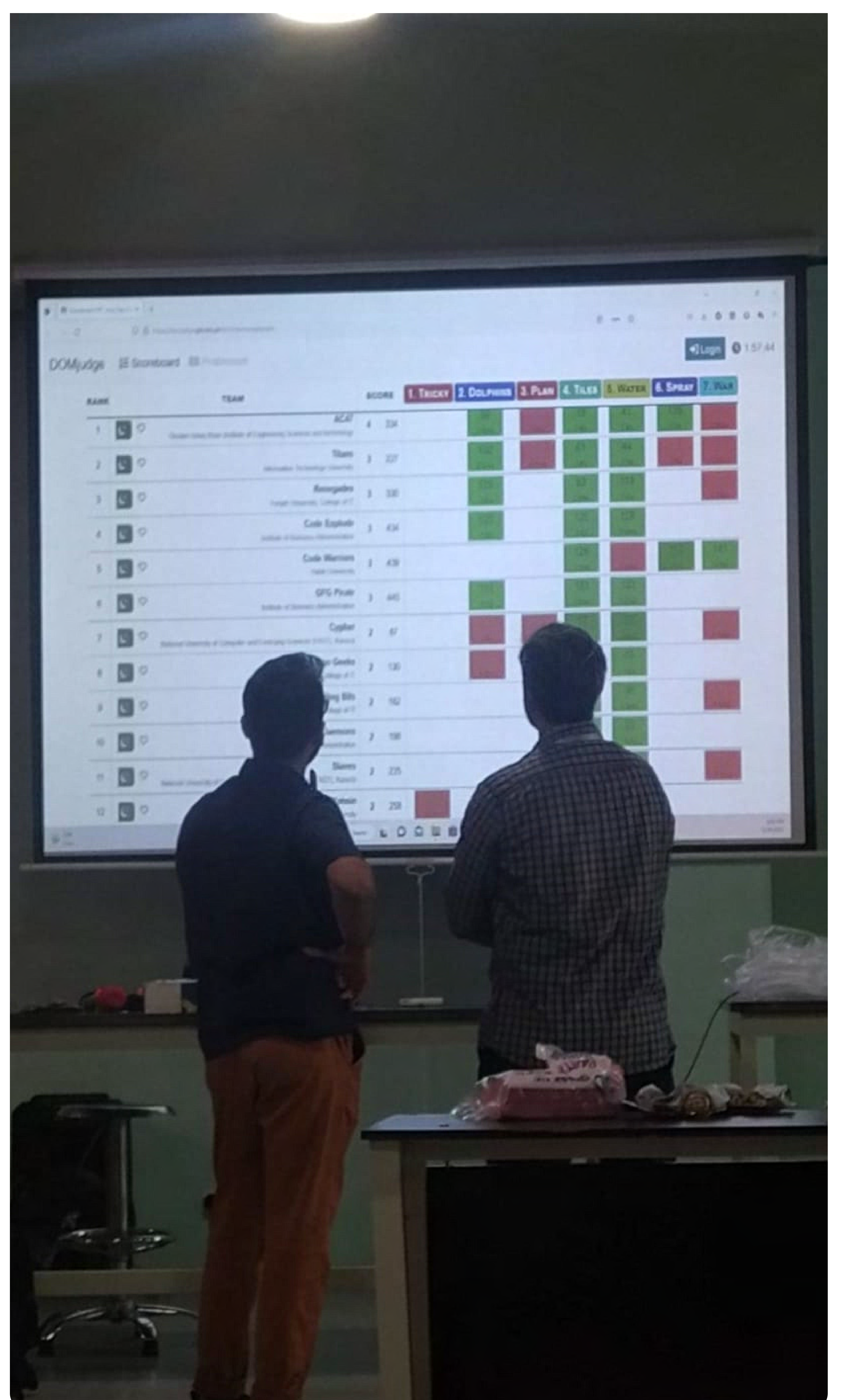
IFTP is a 48-hour intensive design experience in which students throughout the world work to solve some of the most pressing concerns facing the planet today. During this event, put together by Texas A&M, students from 37 different universities work around the clock to use multidisciplinary thinking, creativity, and technological innovation to work on their chosen need statement (or challenge).



Thanks to our enthusiastic volunteers, passionate students and supportive mentors, the event in 2020 went exceedingly well. We witnessed 48 hours of not just creative thinking and innovative problem solving, but also empathetic teamwork, fun, and a golden opportunity to create new memories with other peers.

INTERNATIONAL COLLEGIATE PROGRAMMING CONTEST QUALIFIERS

Habib University has been conducting the qualifiers for 'The International Collegiate Programming Contest' for the past three years. In the competition, teams have to solve given programming problems in a limited amount of time. The team with the least amount of tries (each submission equals one try) and the least amount of time taken to solve the problem wins the competition. The top fifty teams from the qualifiers go to GIK to participate in the regionals. Student teams from Habib University have consistently secured positions in the top 10 in the regional round, including 2nd position in 20-21. Over 50 universities participate in the competition annually with the hope of making it to the International finals. The five hour rigorous competition had a lot of female representation this year as well! Be sure to check <https://icpc.global/> and support our teams this year!



STUDENT COMPETITIONS

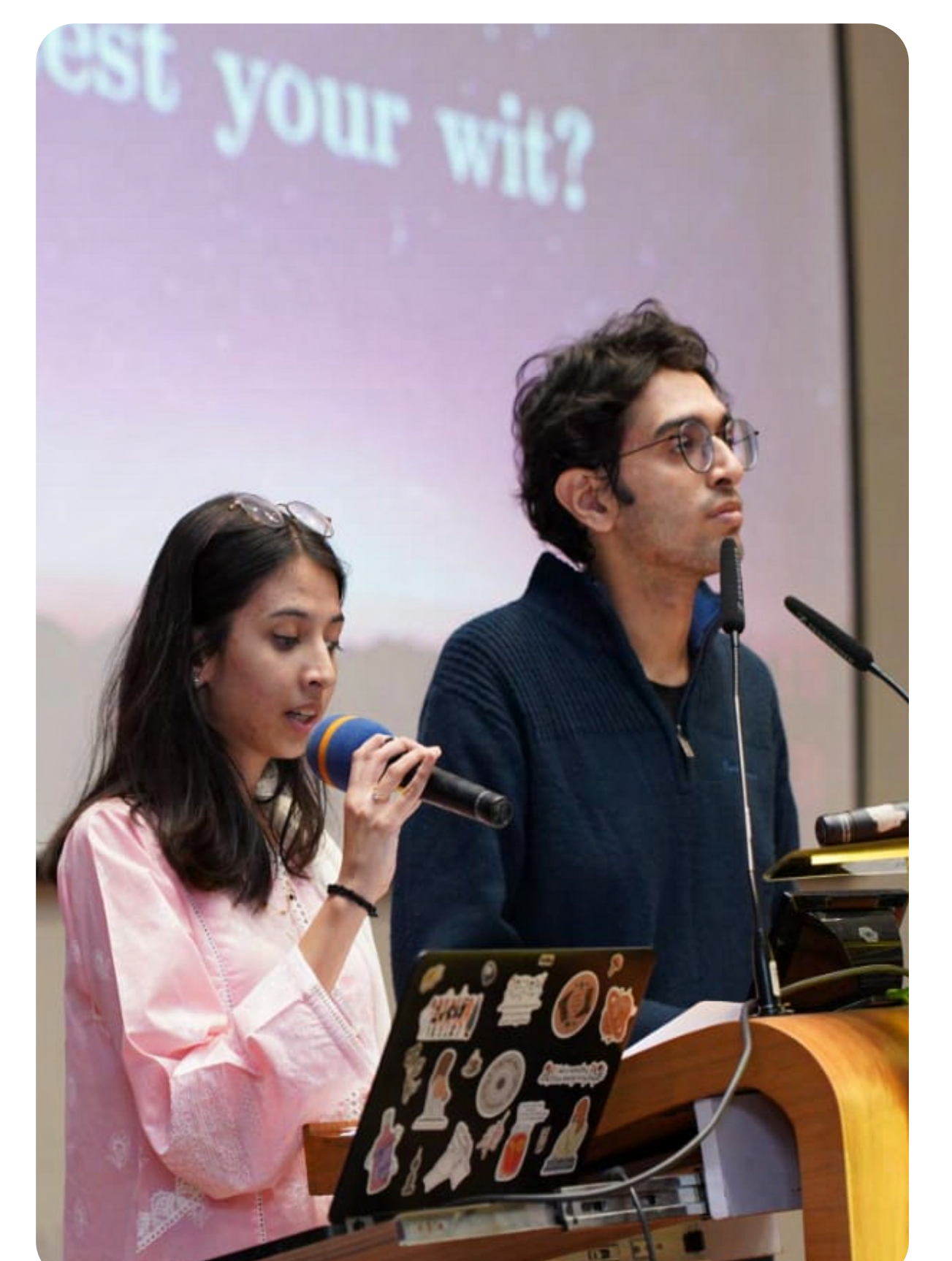
CHESS COMPETITION

Math club held their annual chess competition which included both students and faculty. Adding another notch on his belt Aneeq Akhtar (SDP 2023) won the competition once again.



MATHEMA 2022

Mathema is Habib University's very own math Olympiad. The year saw the inauguration of the event, with 60 teams (180 students) participating in the event. Ailiya Fatima (CS 2025) and Shameer Masroor (EE 2025) hosted the event with vigour. The 135 minutes rigorous competition was filled with passion and determination. Students were given eight problems to solve in the limited time. Professor Rameez Raghieb supervised the event, pitching in his well known 'mathematical proof' problems in the competition. The competition was followed by a refreshment session and then a class on Music and Math by Professor Yousuf Kerai. Sir Yousuf taught students the concept of four beats. The class conducted a great activity that lead students synchronously make a four step beat supervised by the professors iconic Tabla.

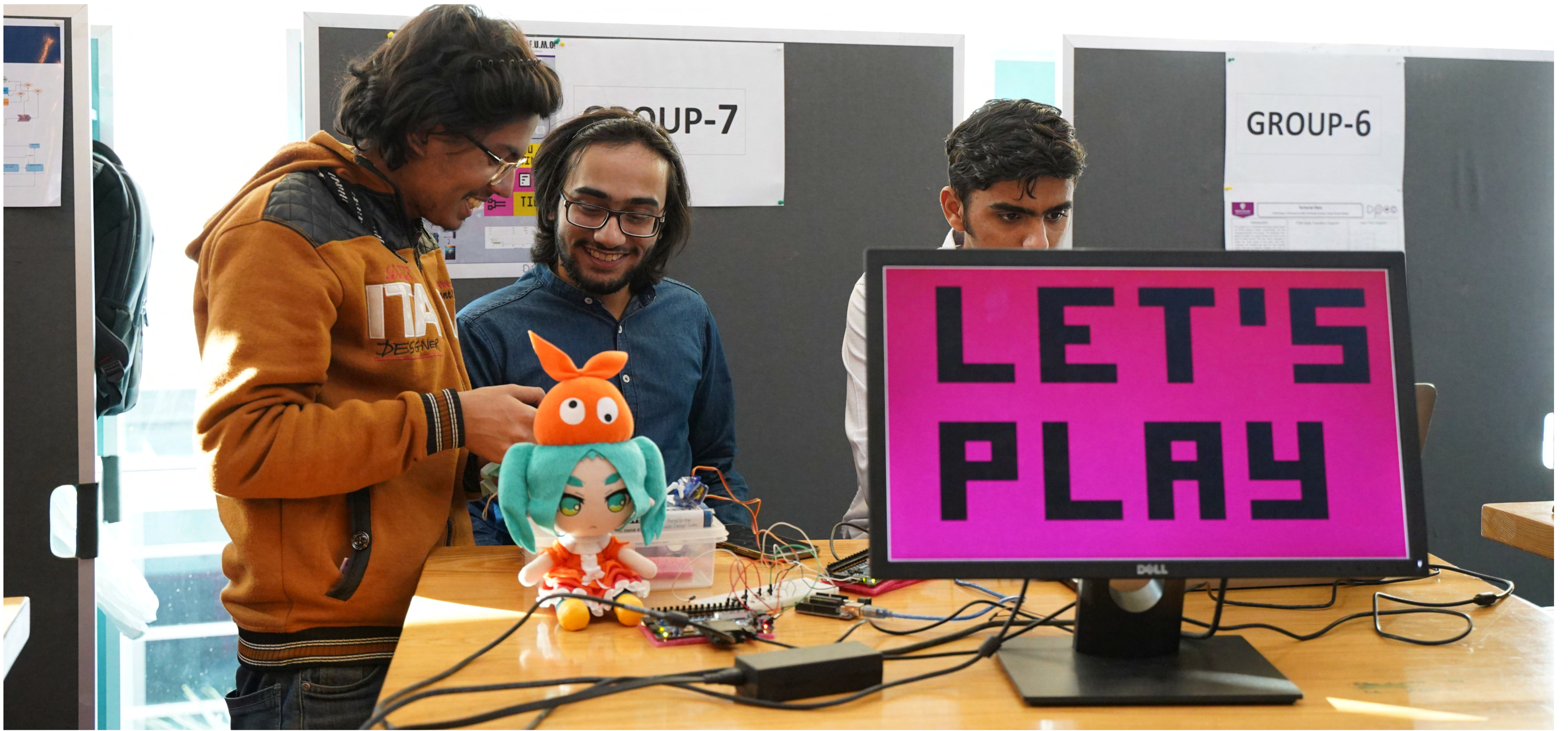




INTERNATIONAL MASTER CLASS: HANDS ON PARTICLE PHYSICS

International Master Class on Particle Physics was a one-day event held on 28th March 2022. This event was attended by about fifty students. It involved discussions and talks on the cutting-edge research undergoing in particle physics. A short activity was planned for the participants in which they worked on the analysis of real data obtained from the Compact Muon Solenoid – CMS experiment, one of the largest international collaboration works at CERN in New Geneva. Not only that the participants get hand-on experience working on data that can unravel the mysteries of phenomena like dark matter and dark energies but they also got the opportunity to have a virtual tour of a huge research facility like CMS detector. Lead by Dr. Sameena Shah Zaman this was a chance for students to meet with physicists all the way from CERN and be a physicist for a day.





DPEC: DLD PROJECT EXHIBITION AND COMPETITION

DPEC (DLD Project Exhibition and Competition) is an annually held exhibition for the students enrolled in the Digital Logic & Design (Course Code: EE 172) course at Habib University. In this event, students exhibit their course projects and the skills they acquire during the entire semester. DLD is one of the competitive, challenging and demanding courses offered at Habib University which not only educates students about the digital logic hardware designing but also prepares them to be able to design, develop and test hardware on chips. The event DPEC not only serves as an opportunity for students to showcase Design & Development skills instilled through the course but also an opportunity for Industry and Practicing Professionals to interact with students for collaboration through internships and projects. This year project 'Jam 'N Dance' won first prize with their exhilarating dance floor!





WOMEN IN STEM PANEL DISCUSSION

Globally, women hold only 28% of STEM (science, technology, engineering, and math) jobs and are outnumbered by men in most STEM undergraduate majors. The gender pay gap is pronounced in some of the fastest-growing and highest-paying STEM fields, such as Computer Science and Engineering. Habib University, as a premier Liberal Arts and Sciences institution, aims to address this gender gap in STEM through its educational model.

Recently, Habib University organized a session at the Adab Festival at Frere Hall, Karachi, called "Women in STEM – Inspiring Stories from Habib University." Dr. Sameena Shah Zaman, Associate Professor, Integrated Science and Mathematics at Habib University, moderated the session, and Dr. Haleema Qamar, Associate Professor of Electrical and Computer Engineering at Habib University, and several Habib University alumnae, including Fariha Farooq (EE 2019), Anumtah Aijaz (EE 2020), Areeba Aziz Rajput (EE 2018), Binish Fatima (EE 2022), and Swaleha Muhammad Saleem (CS 2022), and Ms. Swaleha Muhammad Saleem, were speakers at the event.

During the session, Dr. Sameena emphasized that Habib University focuses on nurturing informed citizens and ensures women's participation in STEM. Dr. Haleema Qamar encouraged parents to support their daughters in pursuing STEM and mentioned that Habib University offers a variety of scholarships to foster women in STEM.

PUBLIC LECTURE SERIES

PG - 12

SEEING THE FUTURE FROM AN AI LENS

-Talk by Zayd Enam



AI is commonly associated with automation. But rather than using AI as a force for automation, the world's leading brands are using AI to enhance employees' abilities, leading to a happier and more productive workforce. Leaning on his experience as co-founder and CEO of Cresta, Zayd shared how Expertise AI is helping global businesses upskill their workforce and develop a radically more profitable and productive business.

CYBER-SECURITY: CHALLENGES AND OPPORTUNITIES FOR GROWTH

-Talk by Shahmeer Amir

Shahmeer Amir is ranked as the third most accomplished bug hunter



worldwide and has helped more than 400 organizations, including Facebook, Microsoft, Yahoo, and Twitter, resolve critical security issues in their systems. Following his vision of a safer internet, Shahmeer Amir is the founder and CEO of a cyber

security start-up in Pakistan, Veiliux, aiming to secure all kinds of organizations. Shahmeer also holds relevant certifications in the field of cyber security from renowned organizations such as EC-Council, Mile2, and ELearn Security.

REMOTE SOCIAL SENSING

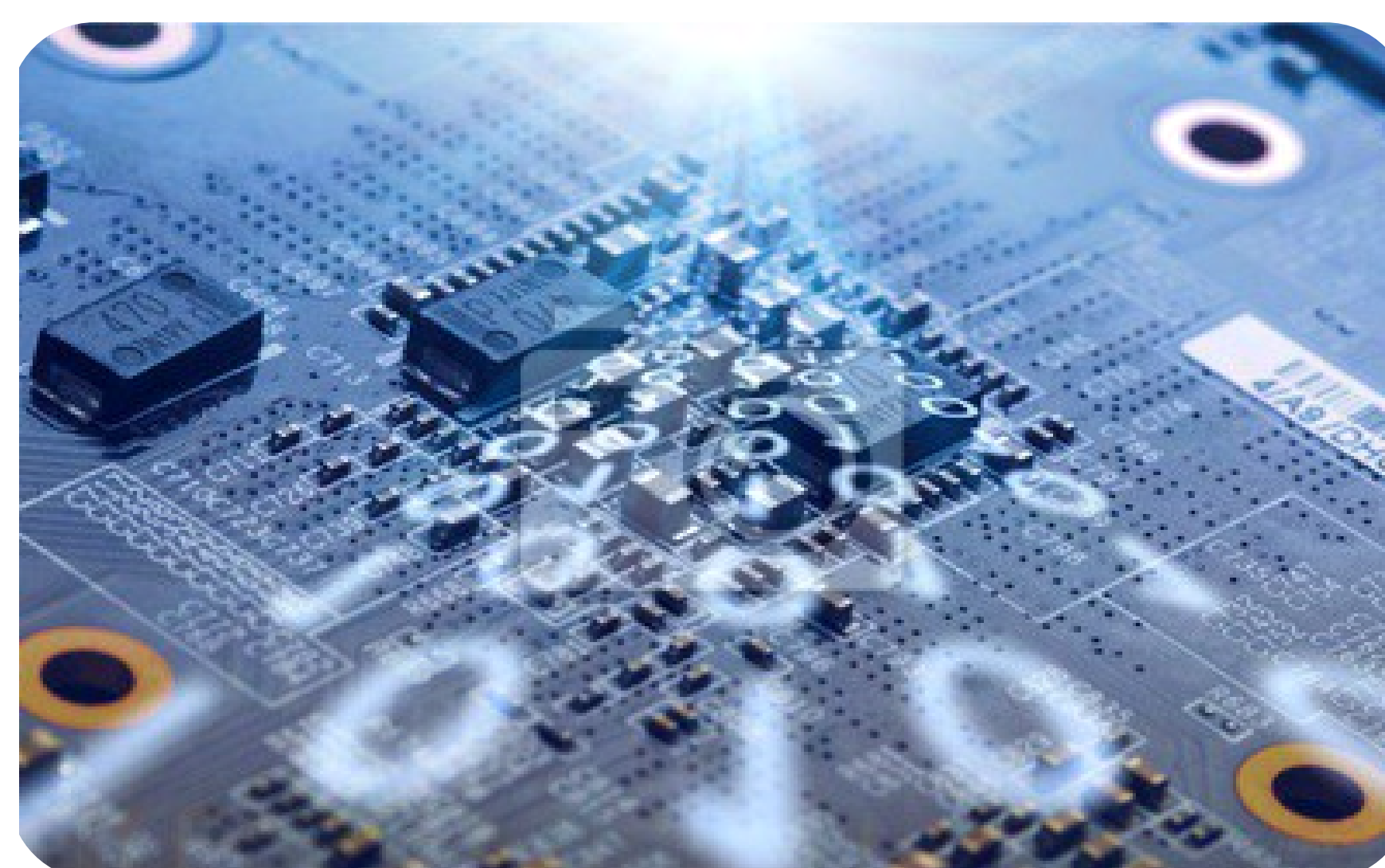
-Talk by Ingmar Weber



Big Internet companies build detailed user profiles to provide advanced targeting capabilities to advertisers. This talk described his team's work with different UN agencies to tap into audience estimates and overcome the challenges posed by fake profiles and noise in the inference algorithms in order to monitor international migration, track digital gender gaps, and map wealth inequalities.

OPEN HARDWARE: ENGINEERING THE COMPUTER OF THE FUTURE

-Talk by Dr. Naveed Sherwani



In this three-part talk, Dr. Sherwani talked about what the future holds for semiconductors and computer architecture, with particular reference to Moore's Law. He also talked about current trends in the industry and his contribution to the RISC-V revolution. He ended the lecture by talking about career development in general.

SOLVING OUR WATER CRISES THROUGH TECHNOLOGY: CHALLENGES AND OPPORTUNITIES

-Talk by Dr. Abubakr Muhammad & Junaid Ahmed Memon



Water challenges surround us, from farms to households. Technological interventions can potentially mitigate some of these challenges. In this event, we heard from two speakers who are working on designing technology based solutions to help improve water management in farms and households across Pakistan.

PAKISTAN'S CASE FOR THE ELECTRIC VEHICLES - A LOCAL AND GLOBAL PERSPECTIVE

-Talk by Dr. Haleema Qamar



Electric Vehicles (EVs) are considered as one of the most effective alternatives to the conventional internal combustion engines to alleviate the greenhouse emissions. In this event, Dr. Haleema Qamar discussed the advantages and the challenges associated with the adoption of the EVs globally. She also discussed the challenges from Pakistan's perspective.



Dr. Junaid Ahmed Memon presented his design of 'Smart Device' that he developed to measure water consumption of households to estimate the water demand of Karachi as part of Karachi Water Project at IECON 2022 held at Brussels, Belgium.

KARACHI WATER PROJECT

Karachi Water Project (KWP) is an interdisciplinary research project that seeks to develop innovative and indigenous solutions to Karachi's water problems. This project is headed by Dr. Hassaan F. Khan, Assistant Professor of Environmental Sciences at Habib University. This research initiative is currently funded through the largest external research grant received by Habib University (PKR 18.2 million) from the Higher Education Commission, as part of HEC's National Research Program for Universities (NRPU) funding call for 2020. KWP's diverse research team includes Water Scientists, Electrical Engineers, Economists, Urban Planners, Sociologists and Computer Scientists. Additionally, the project has collaborations with researchers from other universities, most notably IBA and LUMS.

The team is engaged in four ongoing studies to address Karachi's water challenges:

- Development of a smart device.
- Economics of water in Karachi, assessing willingness to pay (WTP).
- Quantifying factors that limit access to water for vulnerable communities.
- Quantifying water use and its determinants in low-income, water-scarce households.



WWF WETLAND CENTRE

WWF-Pakistan's Wetlands team supervised Habib University's students as they took part in Mangrove Plantation at Wetlands Centre in Fall 2022. The exposure trip was part of the course 'Introduction to Environmental Systems'. The exposure visit was a hands-on-mangrove plantation opportunity to the participants. To inculcate the sense of civic responsibility and responsible consumer behaviour, the students engaged in a beach clean-up activity, clearing out plastic and other garbage from the beach.



TDF MAGNIFICENCE CENTER

Students went on a field trip to TDF Magnificence Centre on November 5, 2022 as part of their Scientific Methods course. The trip was arranged by The Natural Science Club. The centre hosts a number of scientific fields like Physics, Mathematics, Biology, and other interesting phenomena. Students explored all of the various science themes available, which were nothing short of a delight for their minds.

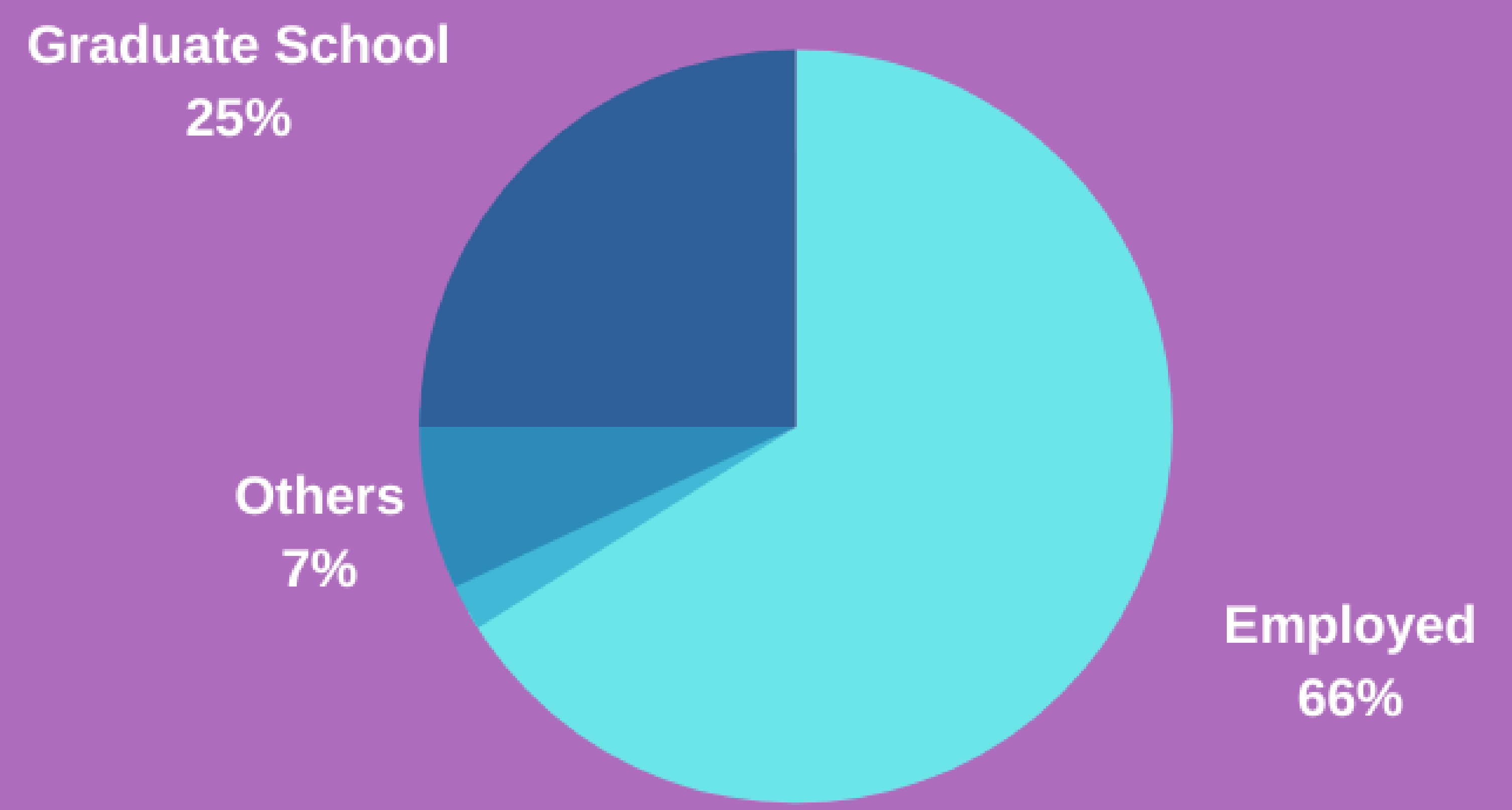
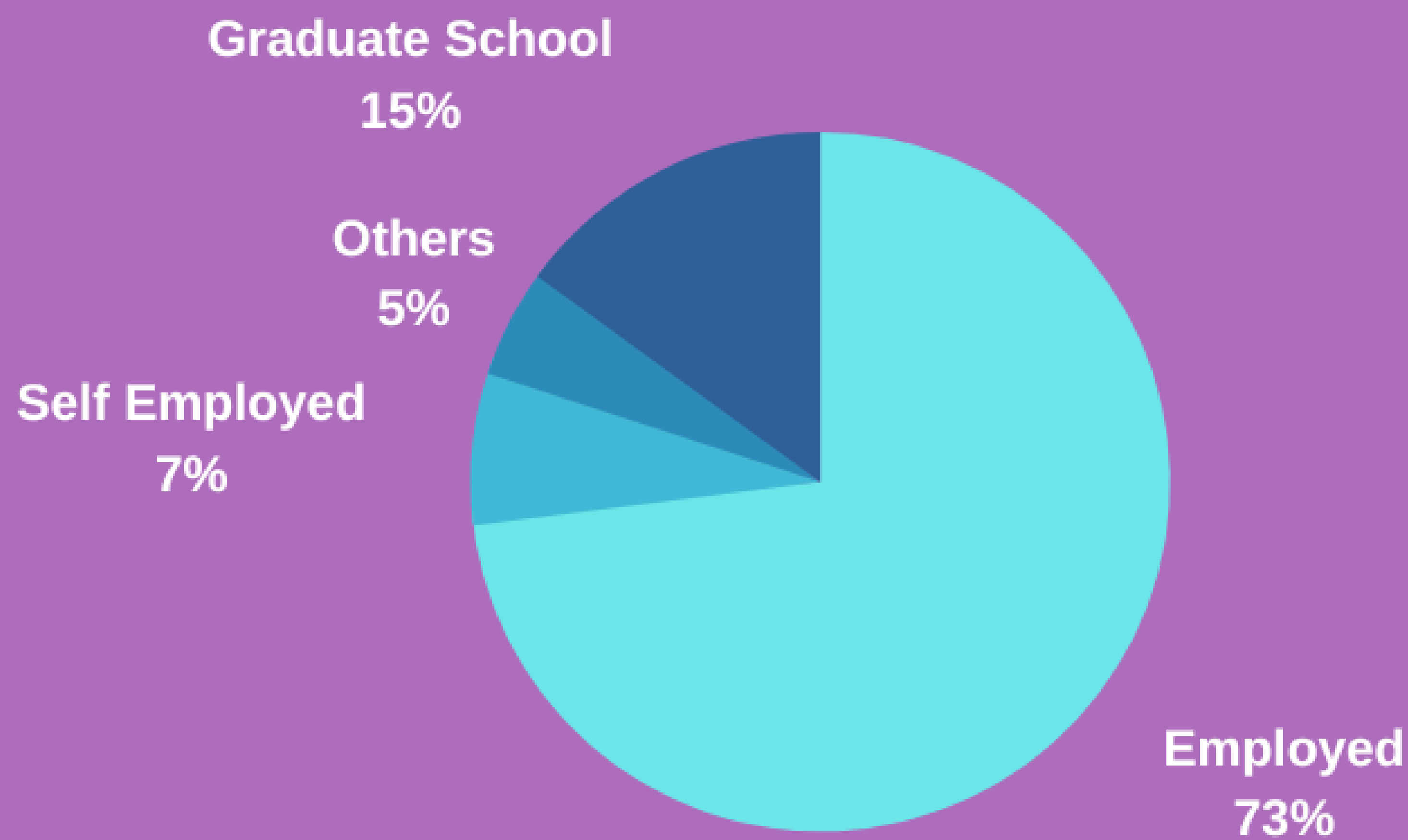
Students had a tour guide on hand to answer any questions they may have. At the end of the trip, the entire HU community also engaged in meaningful scientific or philosophical discussions while munching on their favorite food at Foodology.



ALUMNI SNAPSHOT

COMPUTER SCIENCE ALUMNI STATISTICS:

ELECTRICAL ENGINEERING ALUMNI STATISTICS:



PLACES OUR DSSE ALUMNI WORK AT:

Engineering & Technology
Folio 3
Afiniti Software Solutions
Astera Software
10Pearls
Systems Limited
Securiti.AI
Dastgvr technologies
Stellic
Elphinstone
Liquid Technologies
ABTACH Ltd
Salesflo
Cloud Premiro
Careem

Engineering & Technology
Salesflo
Procheck
NavaPav
SadaPav
Bazaar Technologies
Credit Book
YPav
Indus Motors
K-Electric
Air Lift Technologies
German Aerospace Centre
NRF Engineering
Neura Robotics, Germany
Wavetec Ltd.

Financial Sector
JS Bank
Habib Bank Limited
United Bank Limited
Bank Al-Habib
Faysal Bank Limited
Habib Metropolitan Bank
BMA Capital Management Ltd.
KPMG
Telenor Microfinance Bank - Easyvpaia
ABHI Private Limited
Central Depository Company
Faisal Khan LLC
Tbank

POPULAR COURSES

DSSE COURSES POPULAR AMONGST AHSS STUDENTS

-By Uraib Chamdia

At Habib University, students have the unique opportunity to take courses from different schools. Every year, many students from the School of Arts, Humanities, and Social Sciences (AHSS) take courses from the Dhanani School of Science and Engineering (DSSE) to enhance their skills. The following courses are among the most popular:

Renewable Energy

COURSE CODE: ENER 104

It was a great informative course. You get to study about all sorts of renewable energy, and their uses around the globe focusing specifically on Pakistan. Considering the fact that it was a 100 level course, I would definitely recommend it to other people, because the instructor is amazing! Ms. Sameena Shahzaman puts in a lot of efforts in making the course fun and interactive.

-Heba Kashif, SDP'23

Calculus I

COURSE CODE: MATH 101

I took calculus 1 being an SDP student. Even though I had taken Maths till A-levels what was a bit different was that the no other SDP student was taking math courses with me. I felt as if I was representative of the whole SDP batch in that class, so wanted to do well. I never thought I could enjoy Zoom Based Math Equations but I did. The teacher was so organized and I actually had fun solving questions

-Laiba Farid, SDP'23

Cell Biology and Public Health

COURSE CODE: BIO 101

I got to take Cell Biology and Public Health by Dr Humaira Qureshi in my very first semester. A phenomenal Teacher and an absolutely amazing human. The Labs were equally fun yet challenging as well. The course not only helped me become more aware of the Health Sector but allowed me to express the true Grey's Anatomy Fandom of mine.

-Uraib Chamdia, SDP'26

Understanding the Human Body

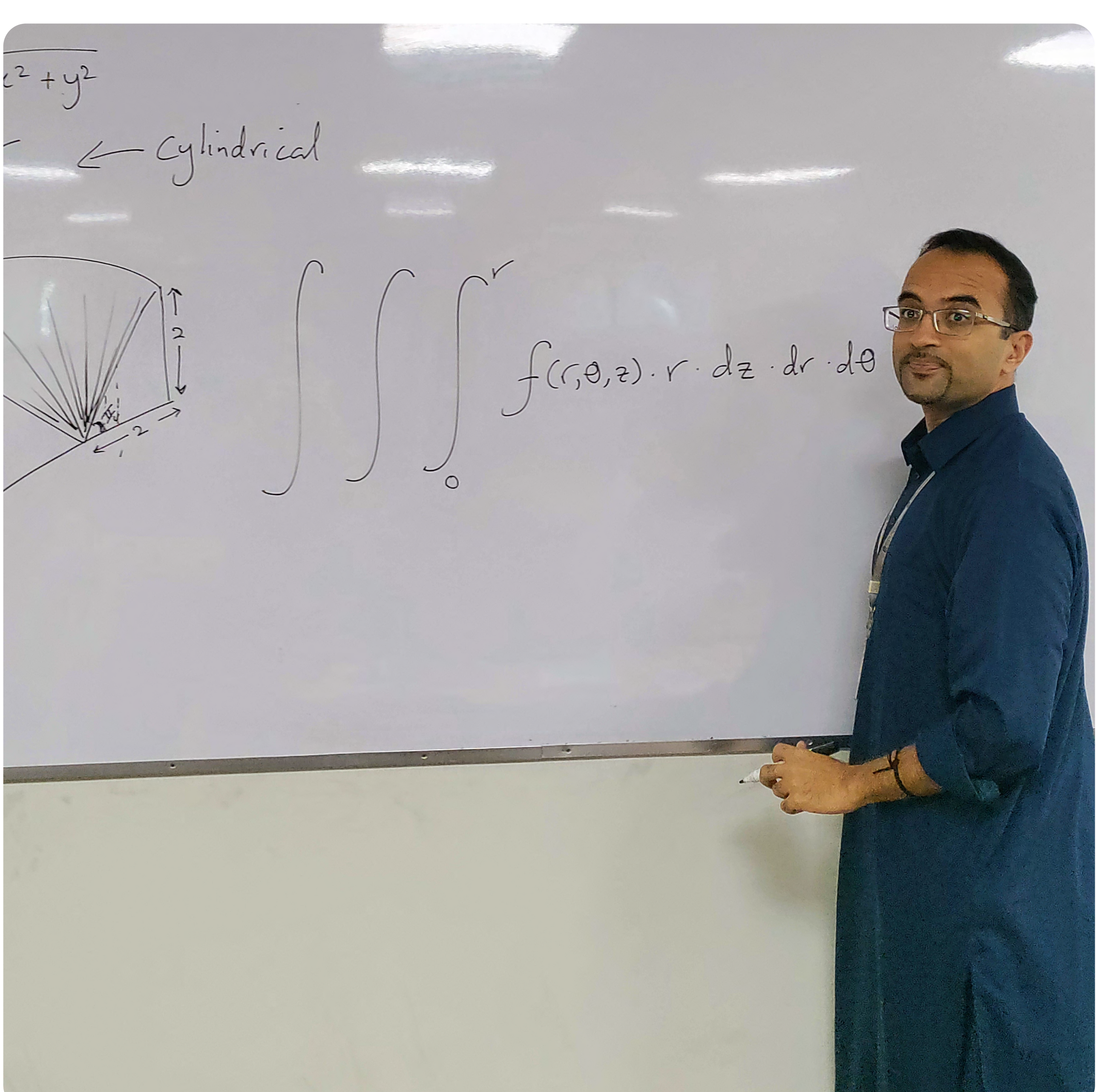
COURSE CODE: BIO 201

I feel that the course answers and adds perspective to a lot of basic yet interesting questions or thoughts that we may have about the functioning of our body. It includes topics which are quite relevant to us students as it helps you learn about why you're experiencing a certain emotion or how your brain responds to a stressful situation.

-Zubia Zubia, CND'24

DSSE SENIOR LECTURER YOUSUF KERAJ

Senior Instructor Yousuf Kerai forms the heart of the DSSE Community. You can often find him with his 'infamous' Tabla in the Music room. Mr. Yousuf is responsible for the freshman maths experience. His approach of giving out 'handouts' has diversified the freshman induction to Calculus I & II. He is a versatile musician and an expert in South Asian Music. Through this art and passion of music, he forms the bridge between the two different (DSSE and AHSS) schools in Habib university. He is a senior instructor in the 'Comparative Humanities' department and a passionate mathematician. As a professor, he encourages students to be curious and fosters a strong connection with them by mentoring them to make the most of their university experience.



WORK IN MUSIC

Mr. Kerai is the founding director for the Center of South Asian Music at Habib University. He oversaw and curated the musical proceedings in the 'Khawaja Munir Mashooquallah' music room. He has also created and implemented the framework of the South Asian Music minor. Mr. Yousuf is also responsible for directing and overseeing the formation of the Habib orchestra and anthem.

Mr. Yousuf is widely known to host and participate in major music events throughout Pakistan, some of the most recent major events are as follows:

- Concert in memory of late Ustaad Khursheed Hussain,
- Kathak dance performance by Farah Yasmeen Sheikh &
- Nazakat Aur Taakat

Q AND A WITH MR. YOUSUF

To learn more about his thoughts on his work on music and as a professor, we held a small question and answer session with Mr. Yousuf

Q. What would you like to achieve as a Professor?

I would like my students to leave the classroom with more questions in mind than answers. Curiosity is what influences all of us. If I could somehow spark this sense of wanting to know the 'how and why's' in a student, then I think I have done my work as a professor. For a curious student will eventually always find a way.

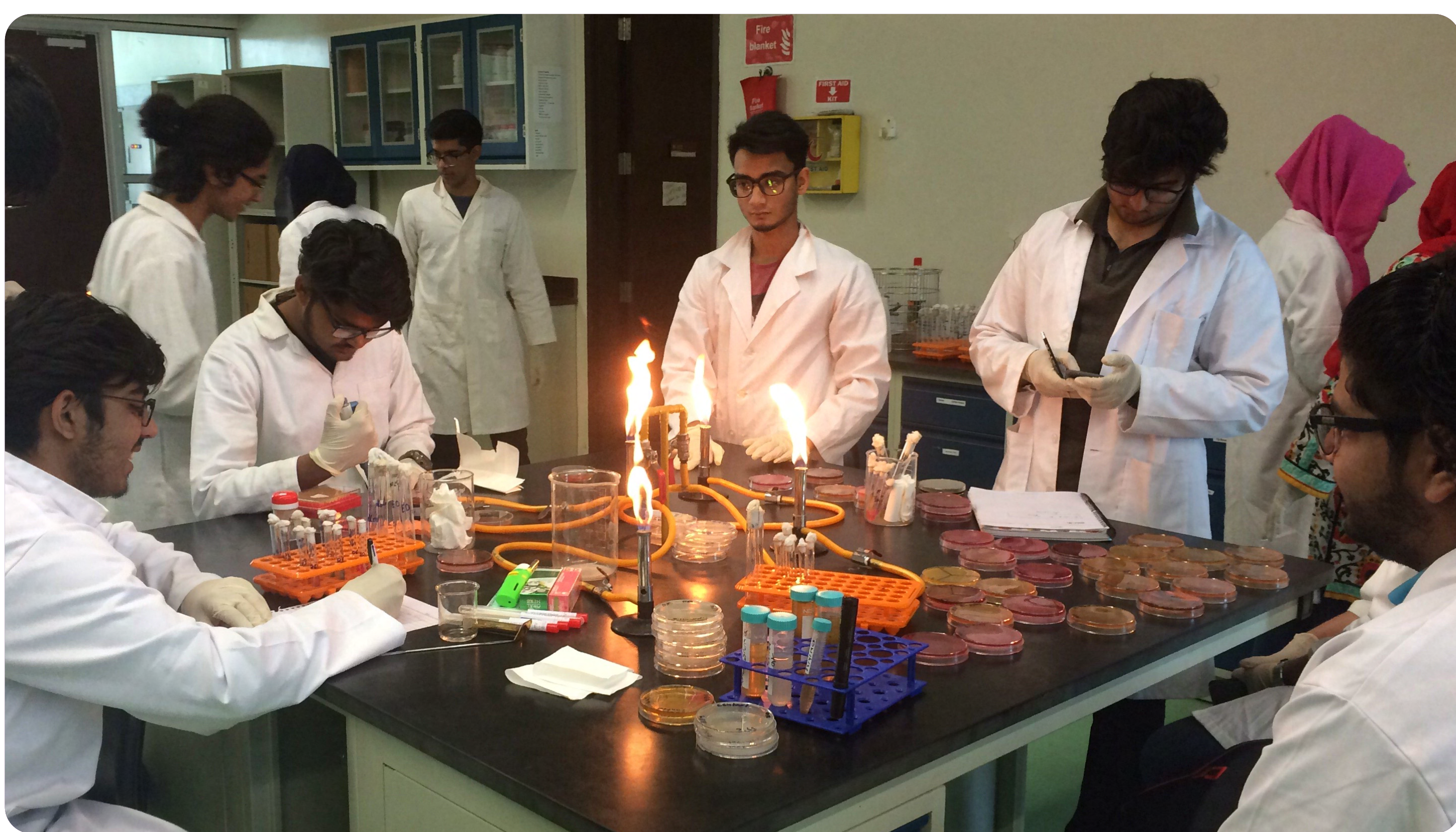
Q. What was your inspiration behind the 'Music and Math' course?

Historically, music and math have always shared a connection. I believe what I brought to the table was the novelty of developing course content that elucidates the mathematics involved in the practice of South Asian Music, thereby making the course a gateway into the music of this region and, to some extent, exalting its stature in the minds of our youth.

Q. There are so many types of music, why are you passionate about South Asian Music?

I continued my grandfather's legacy, who was a great enthusiast and connoisseur of South Asian Music. I was introduced at a very young age to an 'Ustaad' and witnessed an incredible, amazing, and complex system that is very intuitive and accessible. I think the music of the subcontinent is one of the region's greatest accomplishments. Growing up, I saw how the subcontinent has always had its various divisions; ethnic, religious, ideological and so many others. However, music has always been a medium in which all of these divisions have been set aside in reverence of a greater, more potent, entity. South Asian Music is safely the one thing that transcends any linguistic or cultural borders and speaks to an overall South Asian identity."

BIO SCIENCE MINOR



The rationale for the Bioscience minor stems from the bio courses which are already offered at Habib University under the Natural Sciences category.

- Bio courses have created an increased student interest in Biology not just from DSSE but also from AHSS students.
- Post COVID-19 era demands a deeper understanding of biological processes.
- The Bioscience minor will ensure that best students from biology related backgrounds will consider HU as their institution of choice
- It will facilitate capacity building of students, enabling them to acquire specialized skills and knowledge which will complement with their primary area of study
- It will give students a competitive advantage in a diverse range of sectors including Healthcare industry, Food industry, Public Health, Natural Resource Management, Health Policy Development, Agriculture, Medicine, Sustainable Development, Disease Management, Data Science, Bioinformatics, Systems Biology as well as Academia and Research labs.

The bioscience minor comprises a total of 5 courses, including two foundational courses and three electives (where one should be at the 300/400 level). A minimum of 17 credits are required to complete the program. Labs provide hands-on experience for further research.

Overall, the bioscience minor is an excellent opportunity for students from all majors to explore the exciting field of biology and gain a deeper understanding of its applications in a variety of sectors.

CONTINUING TRADITIONS

DSSE LOUNGE

DSSE Lounge is a biweekly meetup, held outdoors on campus, with the aim of creating a strong and closely knit community. It gives DSSE faculty and staff the chance to unwind and get to know each other over tea and snacks at the end of the week. Faculty members come together to come up with hearty talks and form connections that sometimes end up lasting for lifetimes.



CAREER FAIR

Habib University's annual career fair titled "Career Connect 2022" was held on March 22, 2022 after a pandemic-related delay of almost 2 months. The 5th edition featured 85+ companies and was attended by 300+ students and Habib University alumni.

This event aimed to bring industry and academia together and to connect Habib University students with leading organizations from almost every industry. It presented the companies with an opportunity to meet with the graduating batch of students as well as evaluate them further for any future employment possibilities within each organization.

The response to the event was overwhelming, particularly from industry leaders representing the Banking, Pharmaceuticals, Technology, Textile and NGO sectors. While some companies held on-the-spot interviews for students, many others encouraged students to drop off their resumes for future consideration.

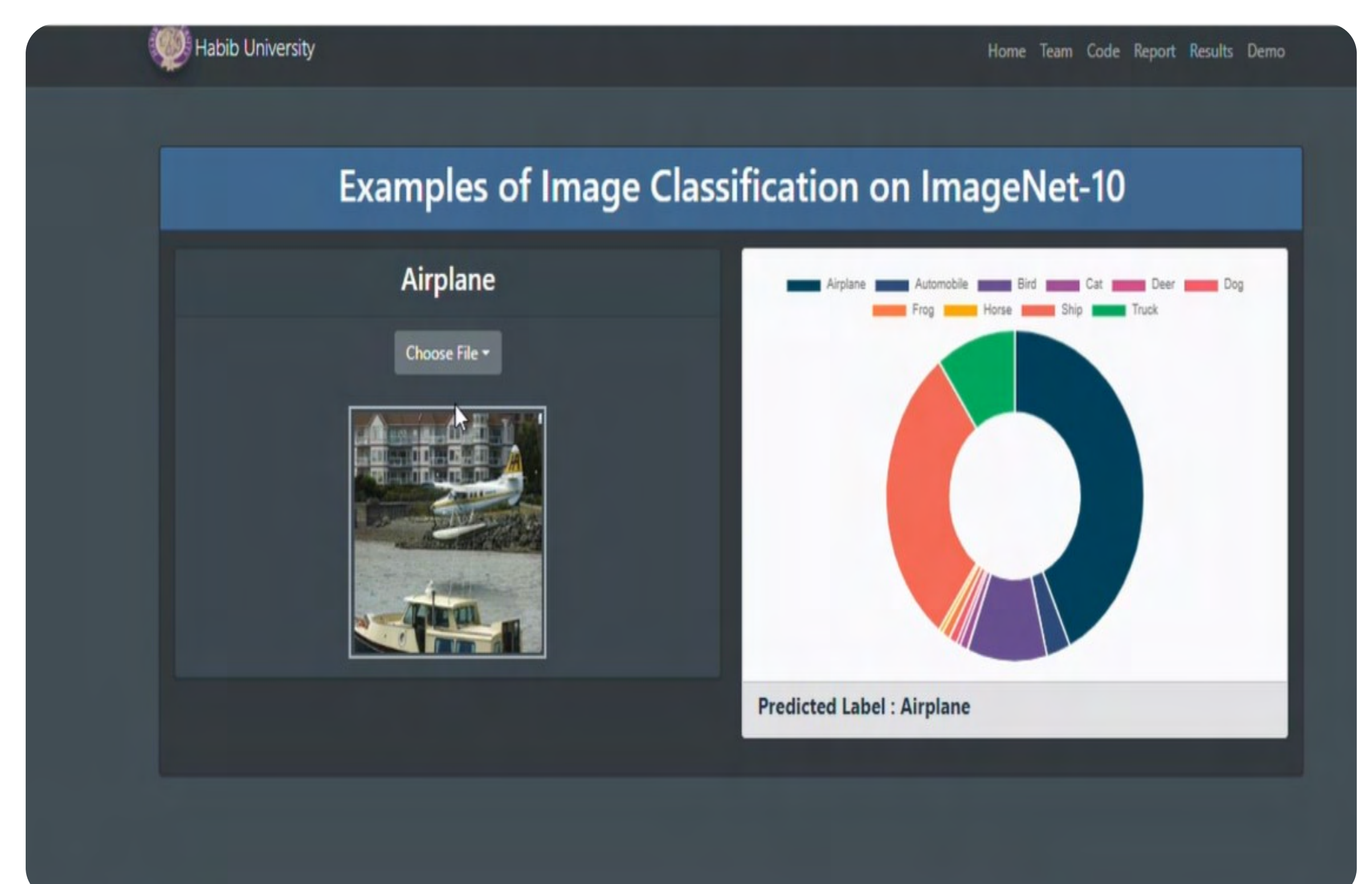
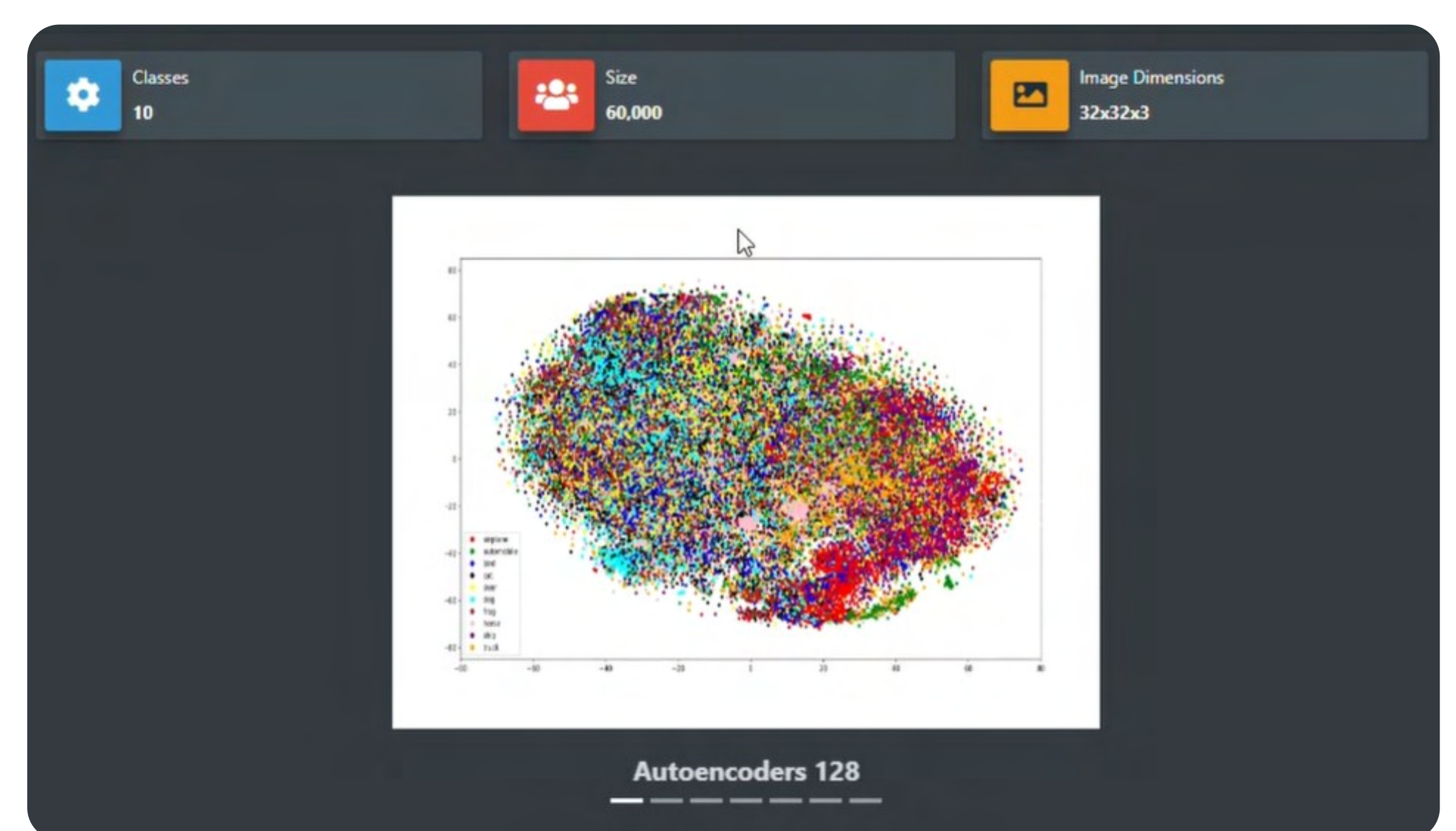
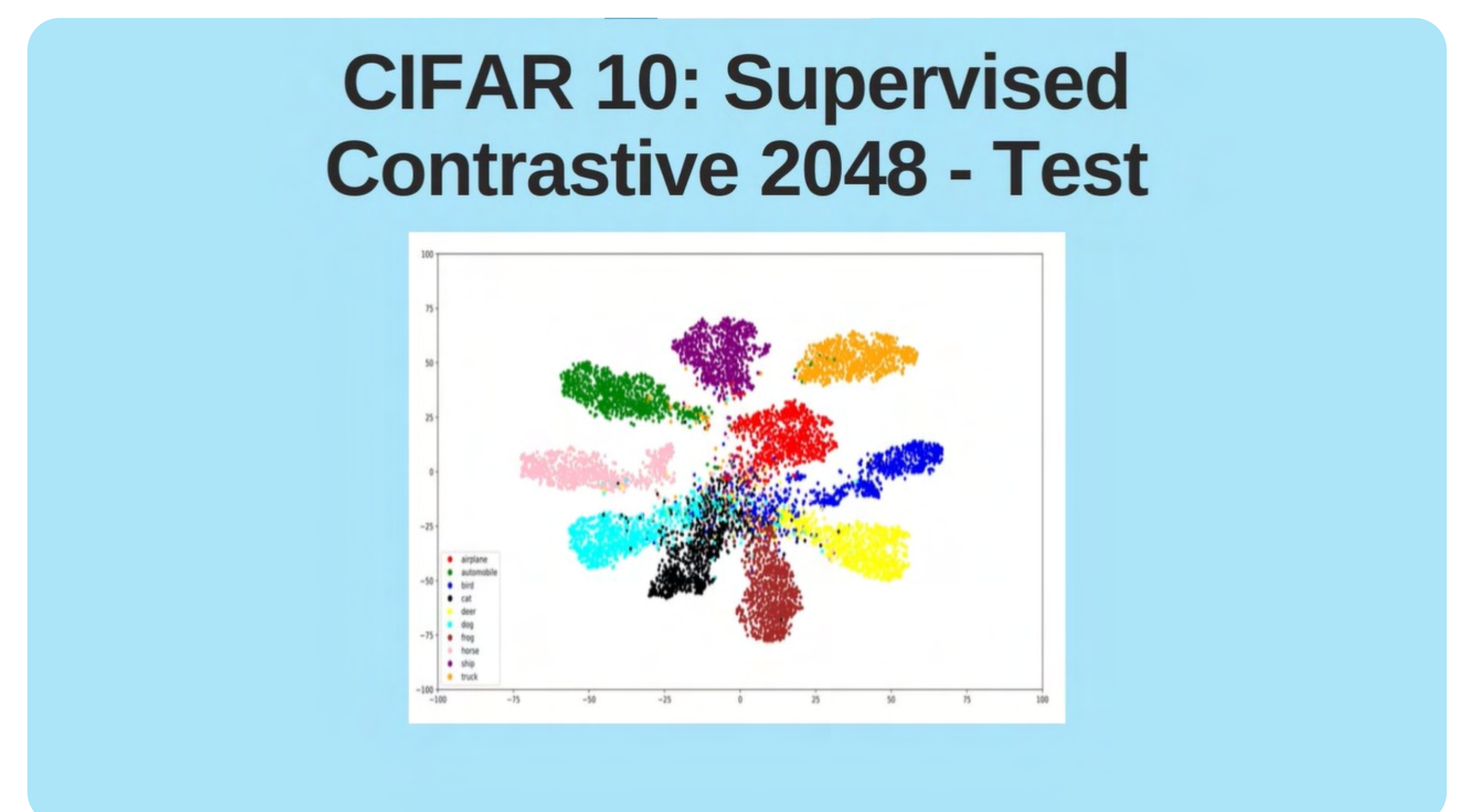
Projects provide students hands-on experience and help them realize the abstract concepts covered in class. A number of courses culminate in exciting and creative final projects. Some of the most exceptional CS final year projects of 2022 are highlighted below

COMPRESSION BASED PERCEIVER ARCHITECTURE

Faculty Advisor: Dr. Abdul Samad

-By Ali Haider Rizvi, Shams Arfeen, Umme Salma & Muhammad Munawwar Anwar

Google's Deep mind aims to build more general and versatile architectures that can handle all types of data. Transformers have the biggest gain on large scale problems. The quadratic complexity of the self-attention mechanism in Transformers makes it difficult to train the model on large scale datasets. There is a need for a model that can be trained on large scale datasets using a reasonable amount of computational resources. As a result, Deep Mind proposed a transformer-based architecture, Perceiver which scales linearly with input size and works on the principle of cross-attention mechanism. Our research question is to evaluate the performance of the Perceiver Architecture for classification when it is passed a latent representation of the image as an input. Our hypothesis is that if the representations capture enough semantic information, the perceiver should be able to classify the embeddings with accuracy comparable to the raw input data. We used both supervised and unsupervised representation learning methods, Autoencoders and Supervised Contrastive Learning. The datasets we used were CIFAR10, CIFAR100, and a subset of the ImageNet dataset containing 60,000 images and the same classes as the CIFAR10 dataset. The obtained results have been evaluated quantitatively and qualitatively, and they establish that embeddings obtained using Supervised Contrastive Learning achieve competitive performance compared to the baselines. On the other hand, the Autoencoder based embeddings fall short of achieving the same performance. This is because the Autoencoder focuses on spatial consistency rather than on semantic information as is the case with Supervised Contrastive Learning. In the future, this work can be extended using multidimensional integration or by creating integrations by distilling knowledge. This study is also for those who are working to generate compressed input representations using different representation learning model.

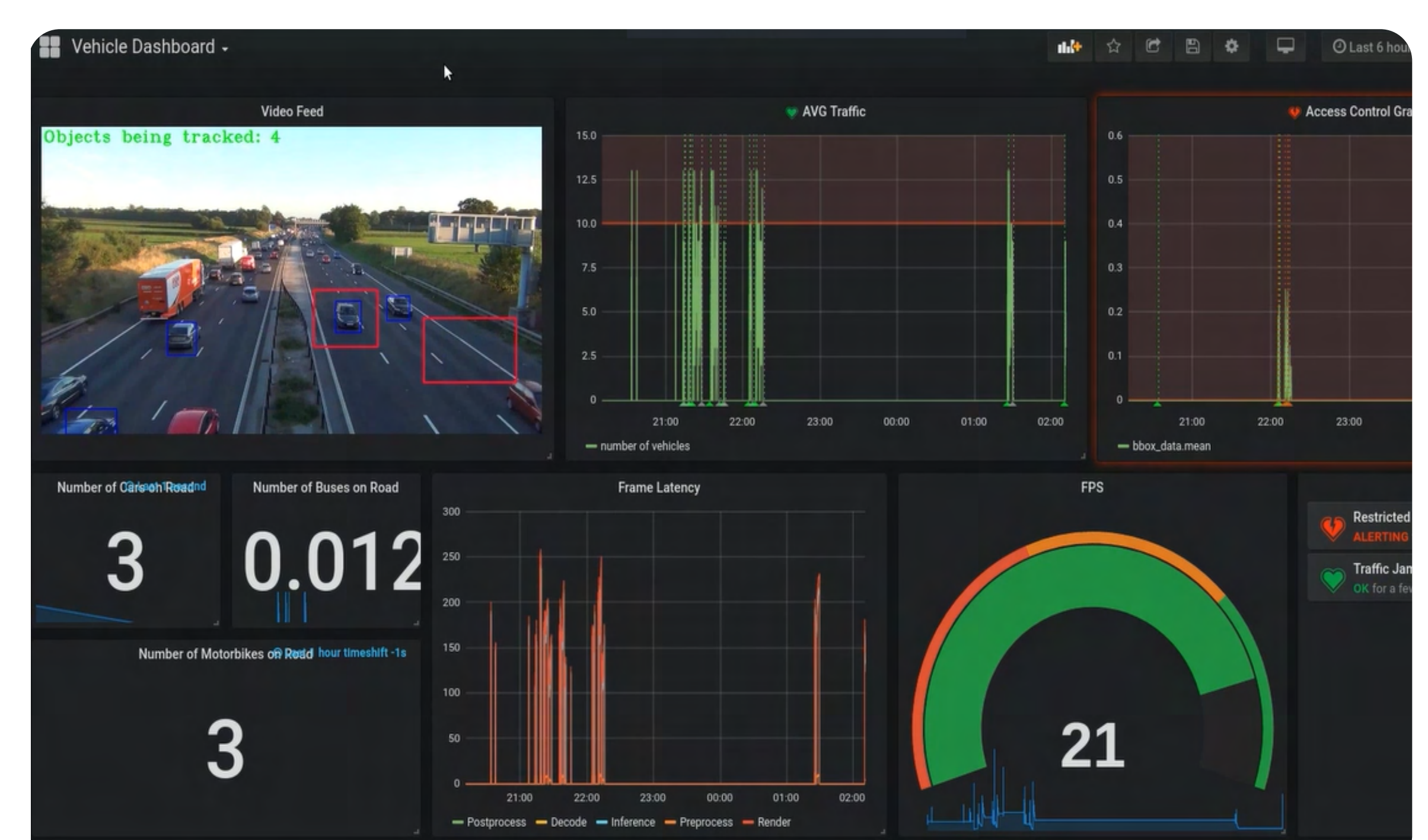


ZAAMIN: A REAL-TIME VIDEO ANALYTICS PLATFORM

Faculty Advisor: Dr. Abdul Samad

-By Arhum Ishtiaq, Maheen Anees, Sara Mahmood, Neha Mumtaz & Khubaib Naeem Kasbati

With security cameras being installed nearly everywhere around us and the mind-blowing advancements achieved in the field of computer vision over the years, there is a wasted opportunity having to rely on human resource for watching over monitors when computer-vision models can not only do the job better but can also be used for collecting actionable insights. Zaamin aims to bring to use the well-earned fruits of years of research in computer-vision to the local context of Pakistan.



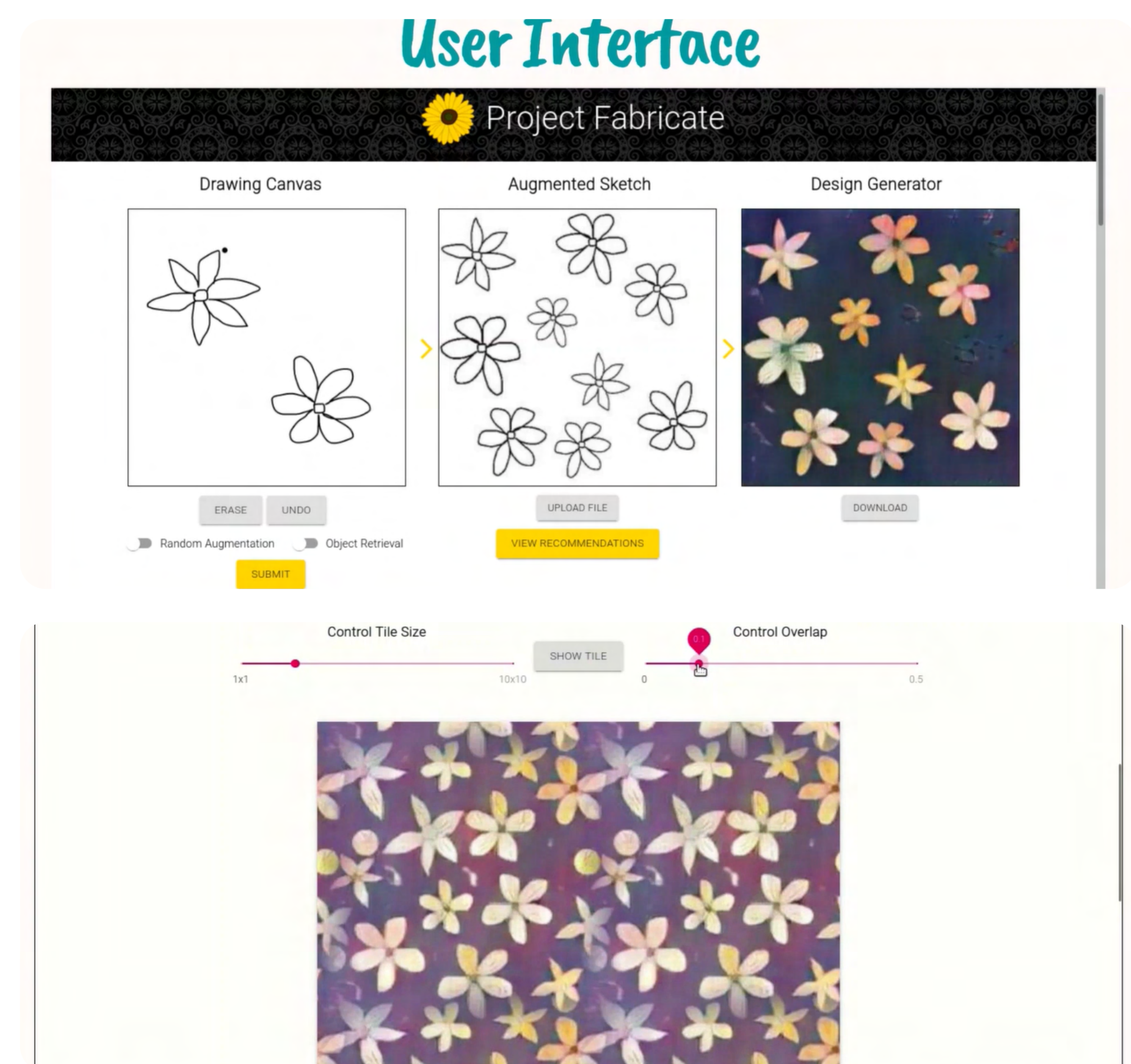
KAAVISH

PROJECT FABRICATE

Faculty Advisor: Dr. Saleha Raza

-By Omema Ahmed, Muhammad Salman Abid & Aiman Junaid

This project introduces a two-fold methodology of creating design patterns, using both traditional object detection and Deep Learning methodologies. The proposed methodology first augments a given partial sketch, which is taken as an input from the user. This sketch augmentation is performed through a combination of object detection, canvas quilting, and seamless tiling, to achieve a repeatable block of a pattern. This augmented pattern is then carried forward as an input to our variation of the pix2pix GAN, which outputs a styled and colored pattern using the sketch as a baseline. The design pipeline is an overall overhaul of the creative process of a textile designer, and is intended to provide assistance in the design of modern textiles in the industry by reducing the time from going to a sketch to a pattern in under a minute.



AUGMENTED


Faculty Advisor: Dr. Waqar Saleem

-By Owais Bin Asad , Aaron Lucas Soares & Arham Ahmed

The modern student has more processing power in their pockets than what was needed to put humans on the moon. Given the wide-spread adoption of smart-phones amongst students, it is amazing to think of the kind of problems that can be solved using technology. The modern classroom, unfortunately, does not live up to its name and lags in the utilization of present-day technology to improve teaching methodologies. AugmentEd is an Augmented-Reality (AR) mobile application that is an effort in digitizing and optimizing the classrooms of today. This Ed-Tech app aims to deliver content primarily through 3D models and narration rendered in augmented reality so that students can see the things they learn about right in front of them as if they were real. AugmentEd took on the challenge of tackling misinformation around the COVID-19 pandemic by delivering educational content that is centered around the core principle of understanding the pandemic from a biological perspective. The final product is an AR mobile application paired with a booklet that serves to maintain the culture of a conventional classroom.

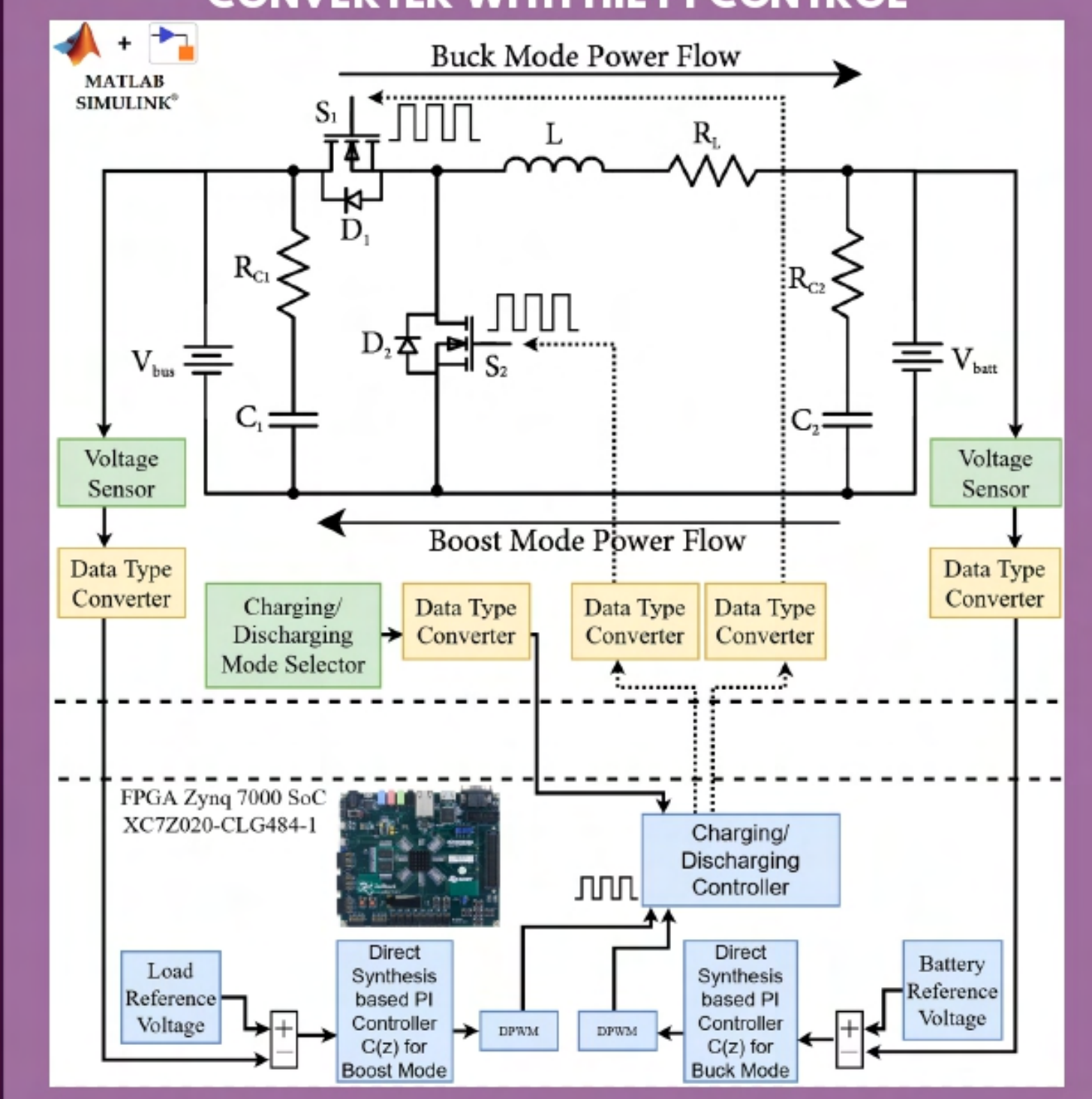
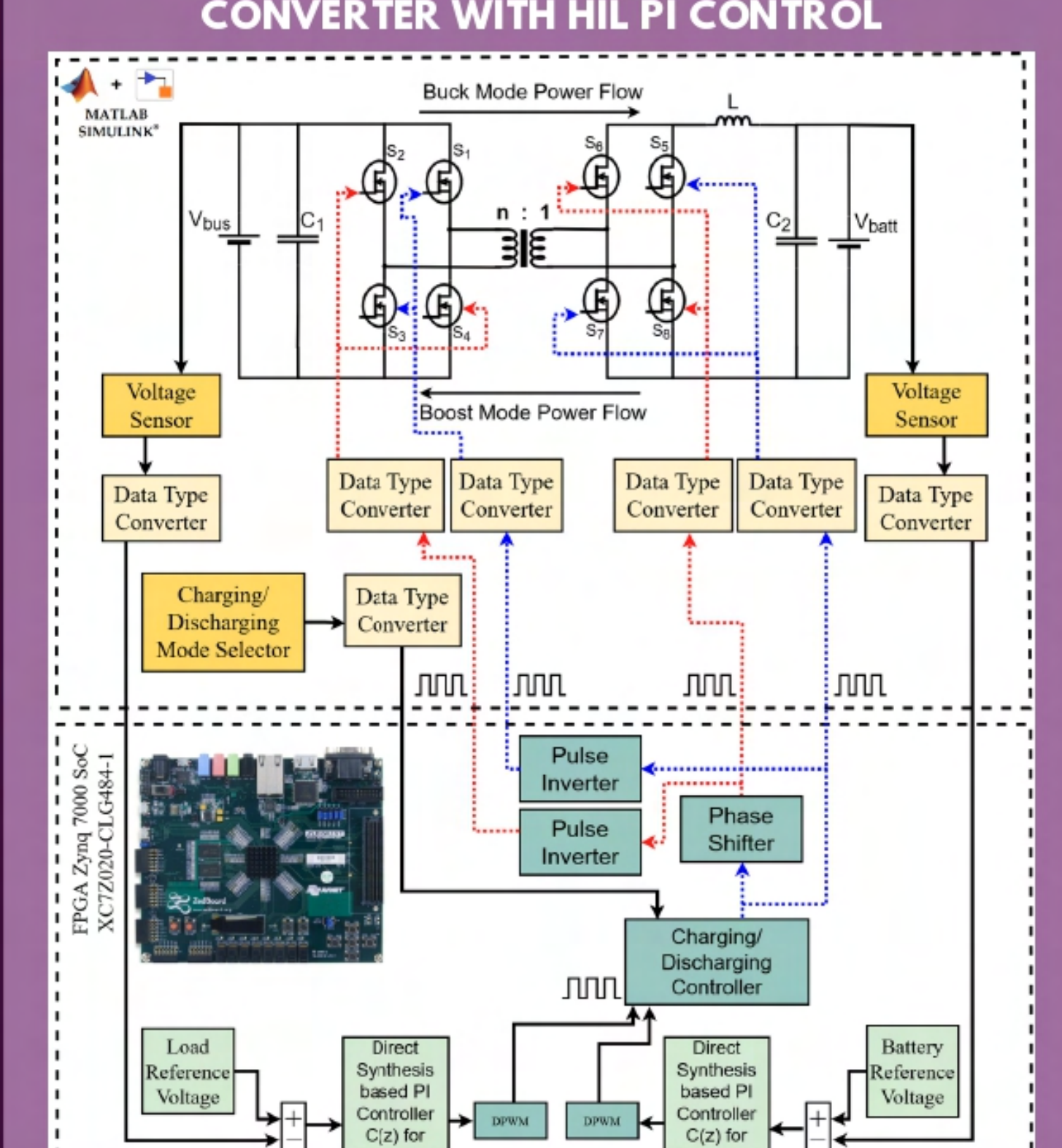
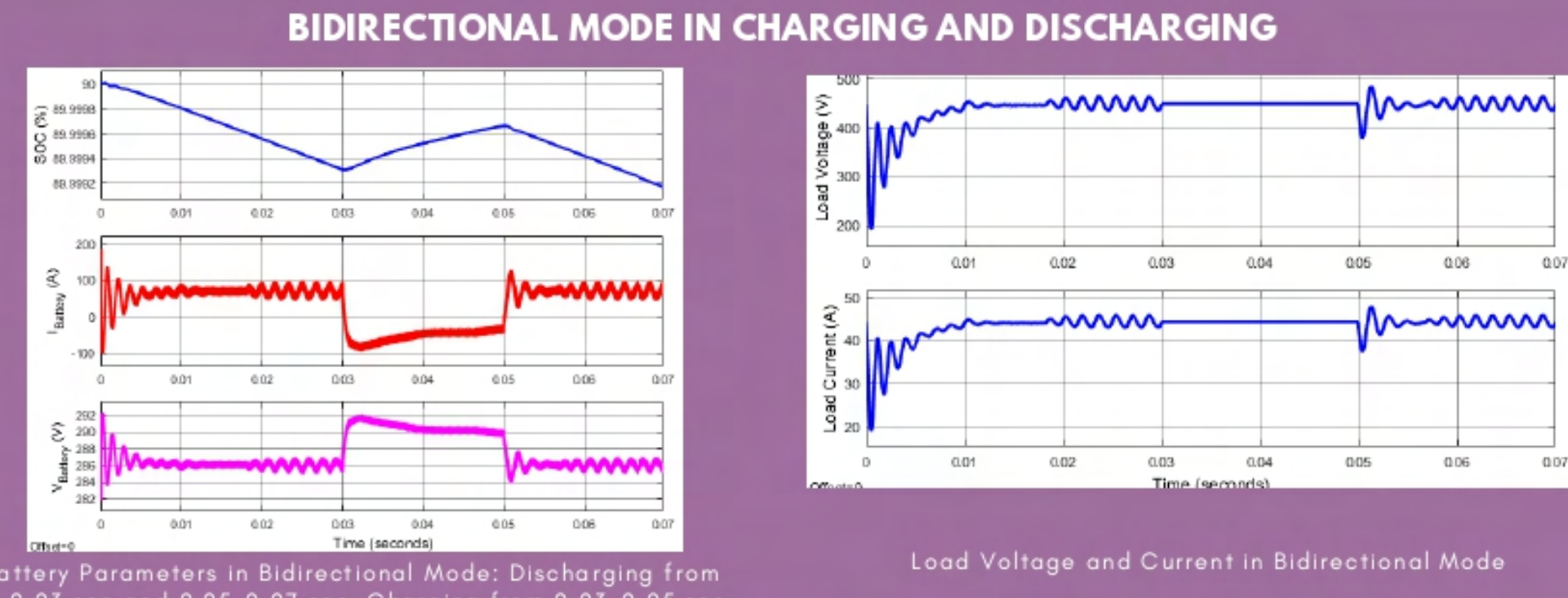
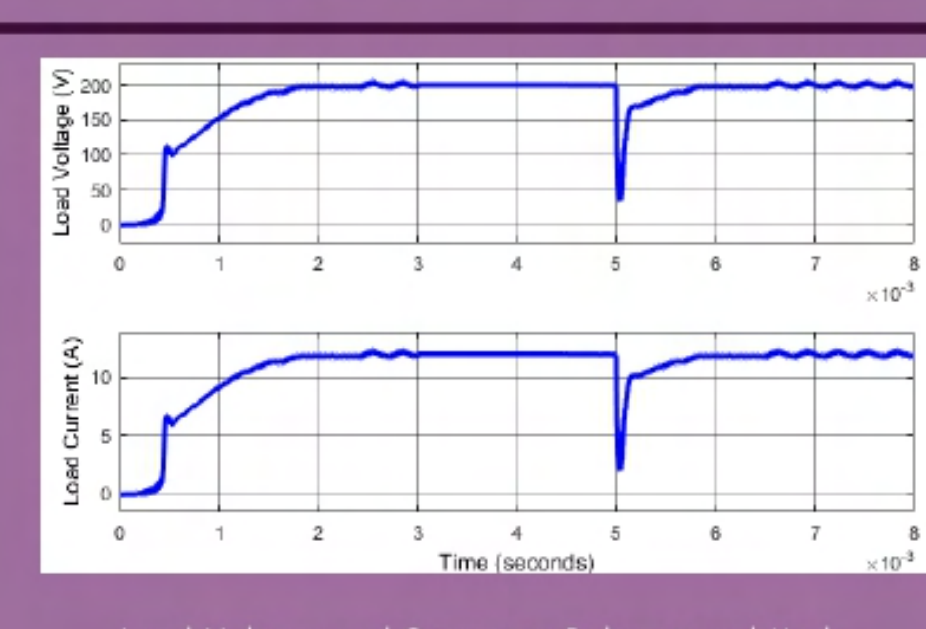
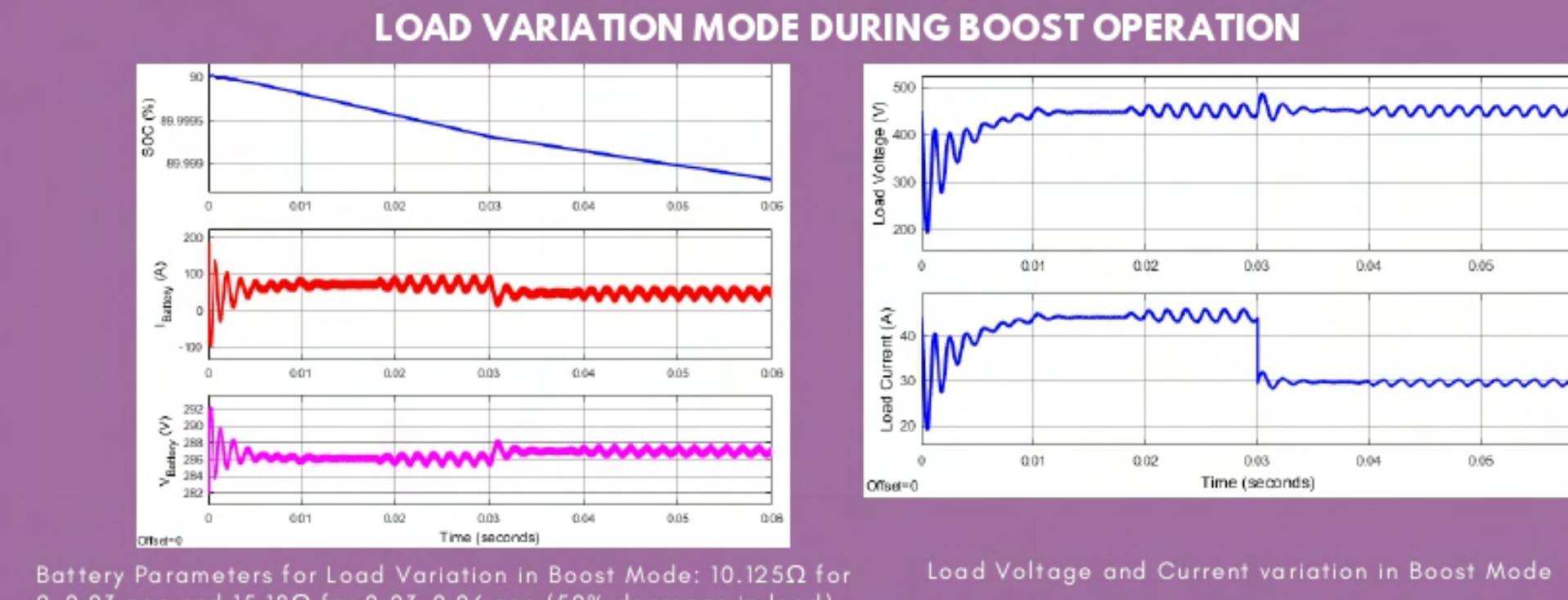
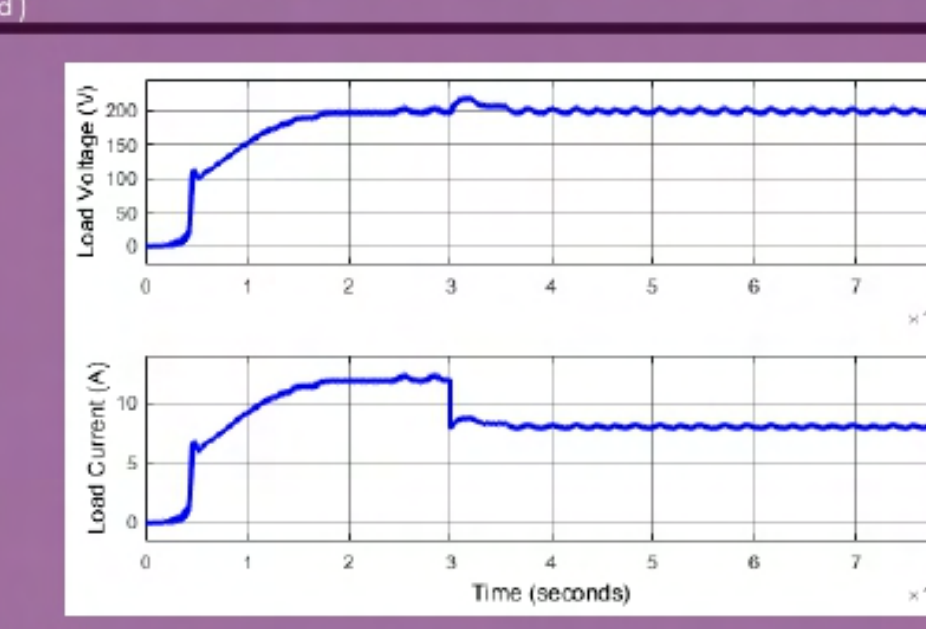
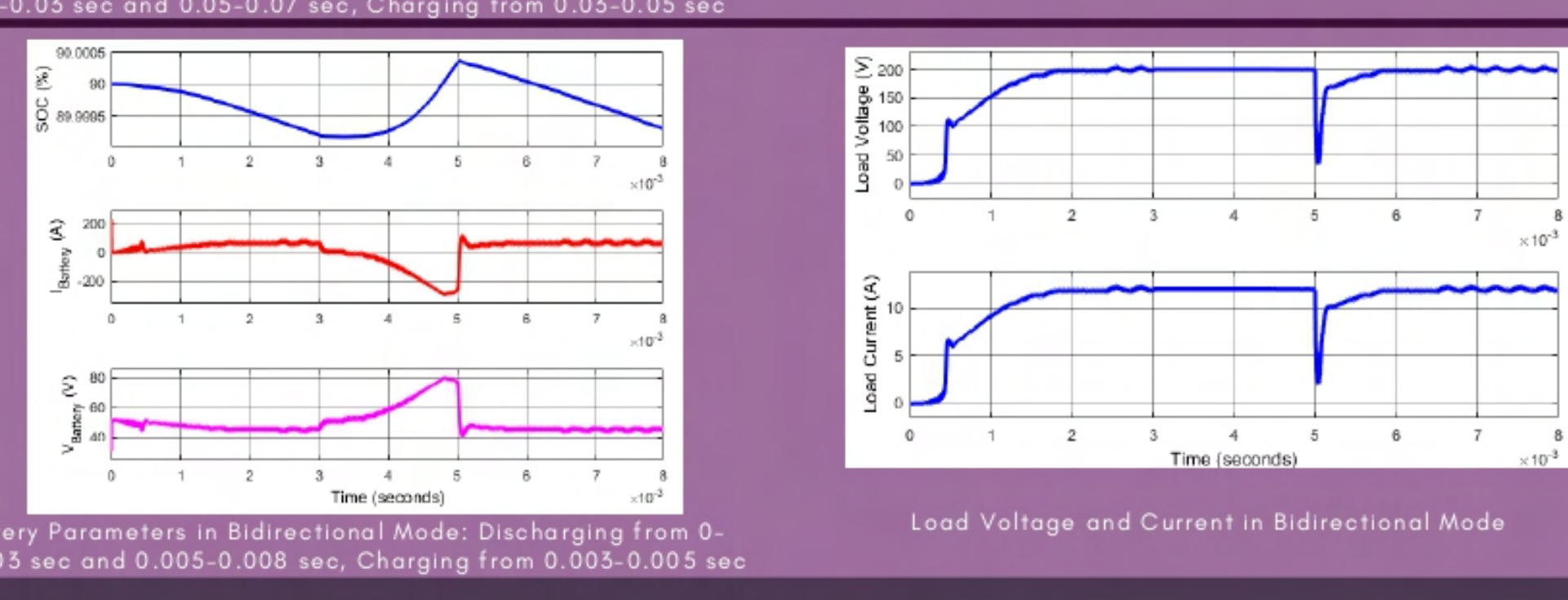
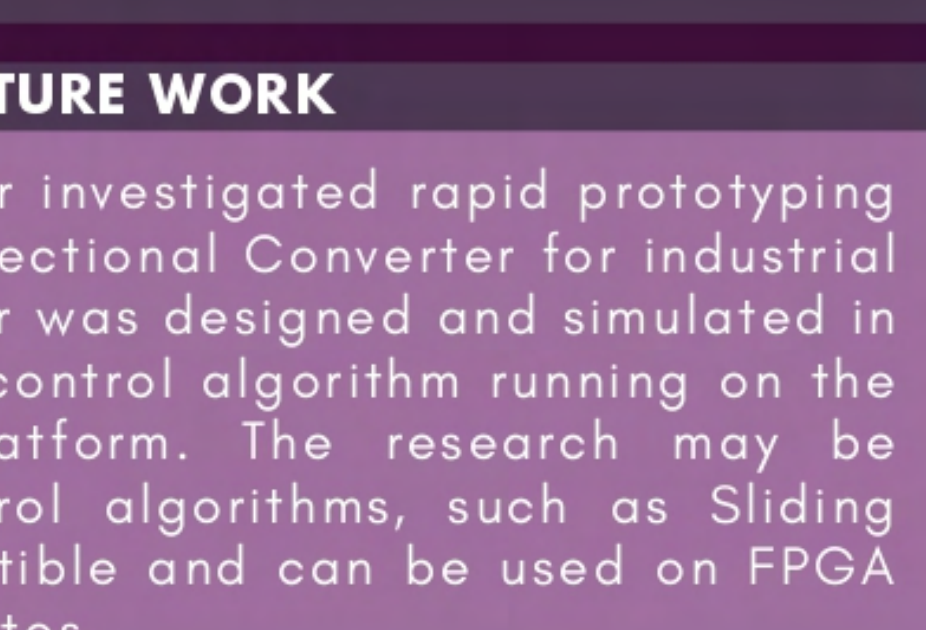
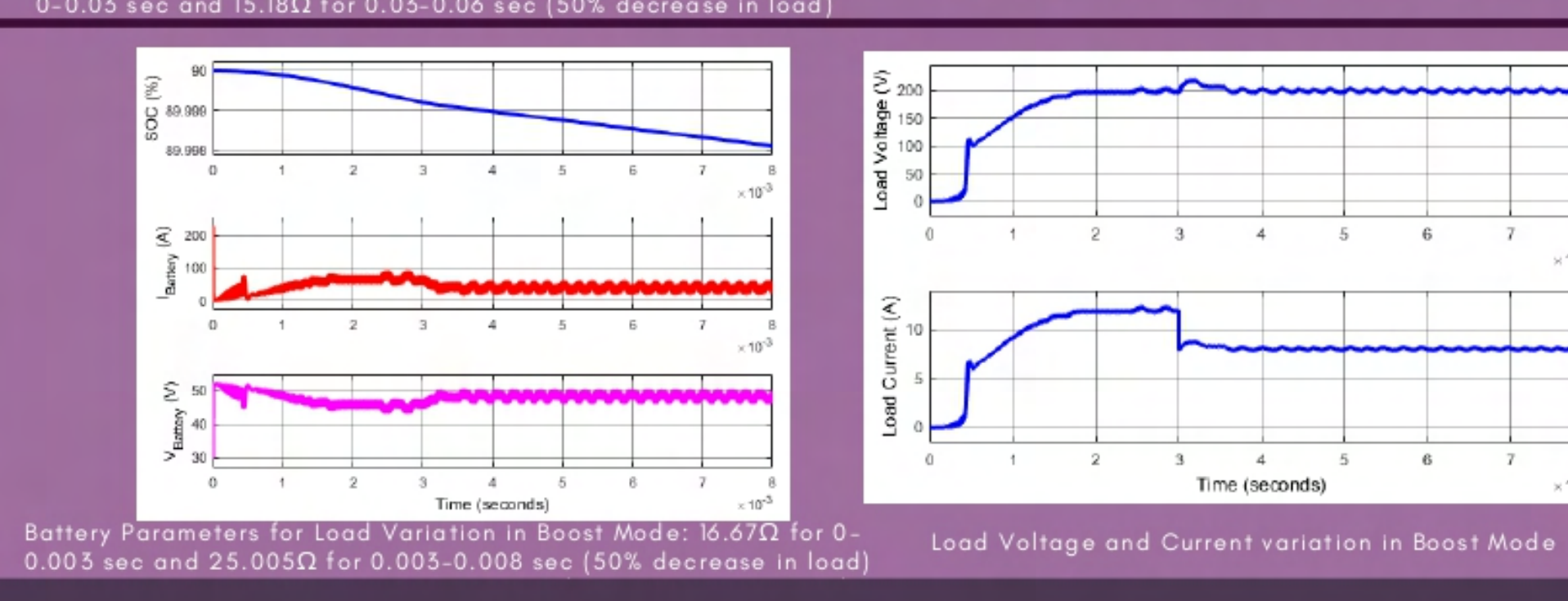
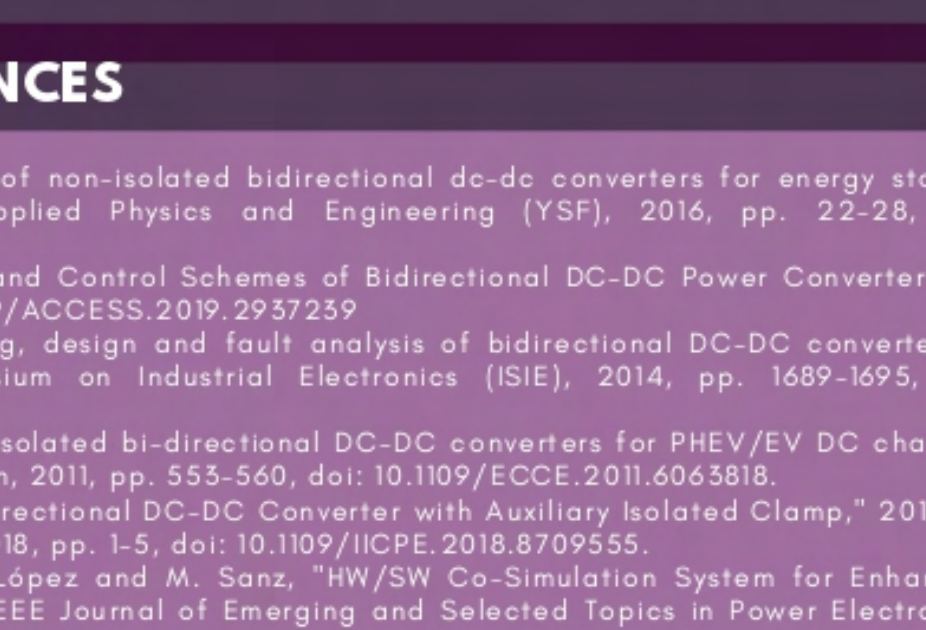



Some of the best ECE Final Year Projects from 2022 are highlighted below:



BI-DIRECTIONAL DC-DC CONVERTER CONTROLLED VIA FPGA-IN-LOOP FOR EV APPLICATIONS

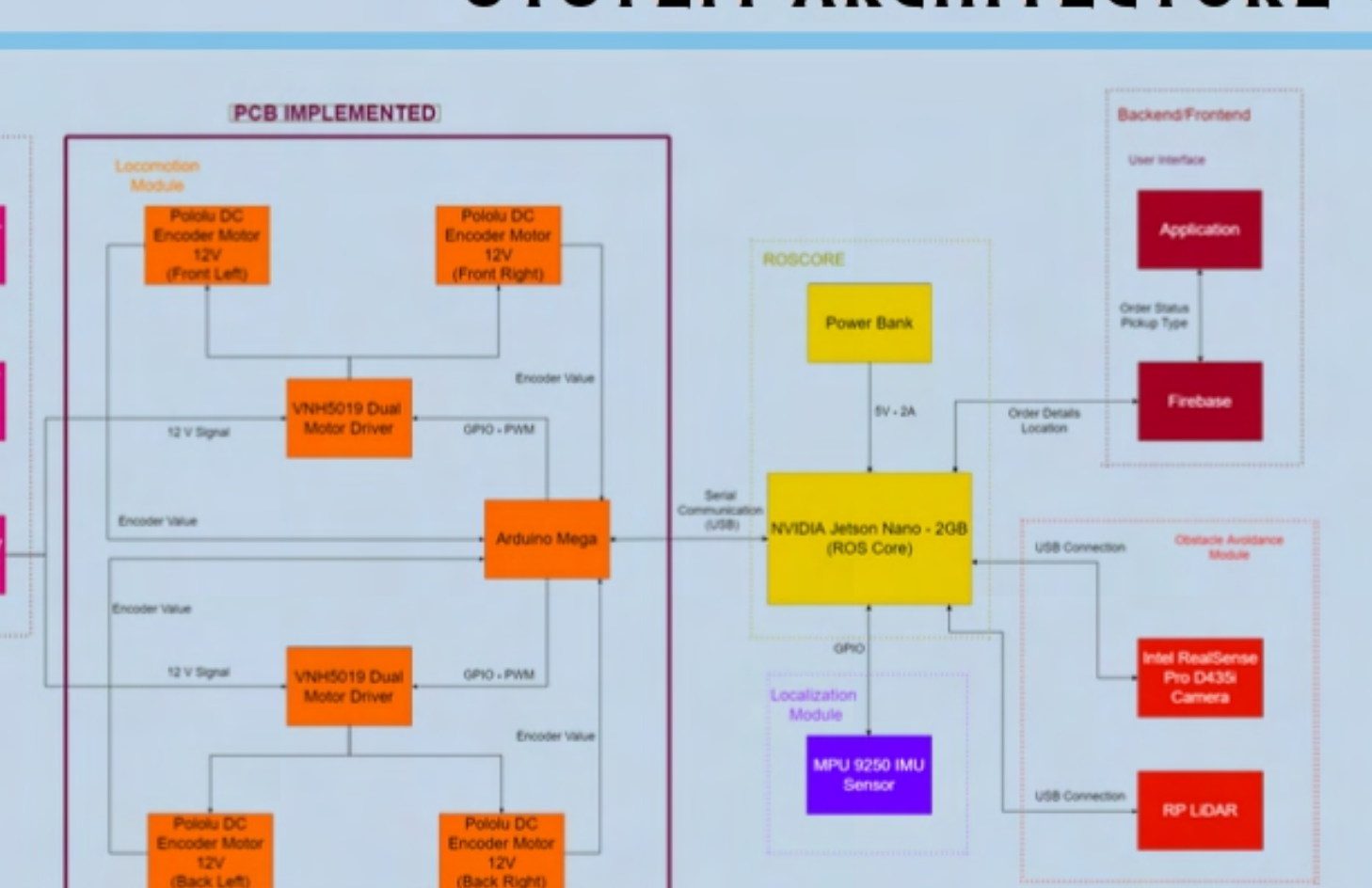
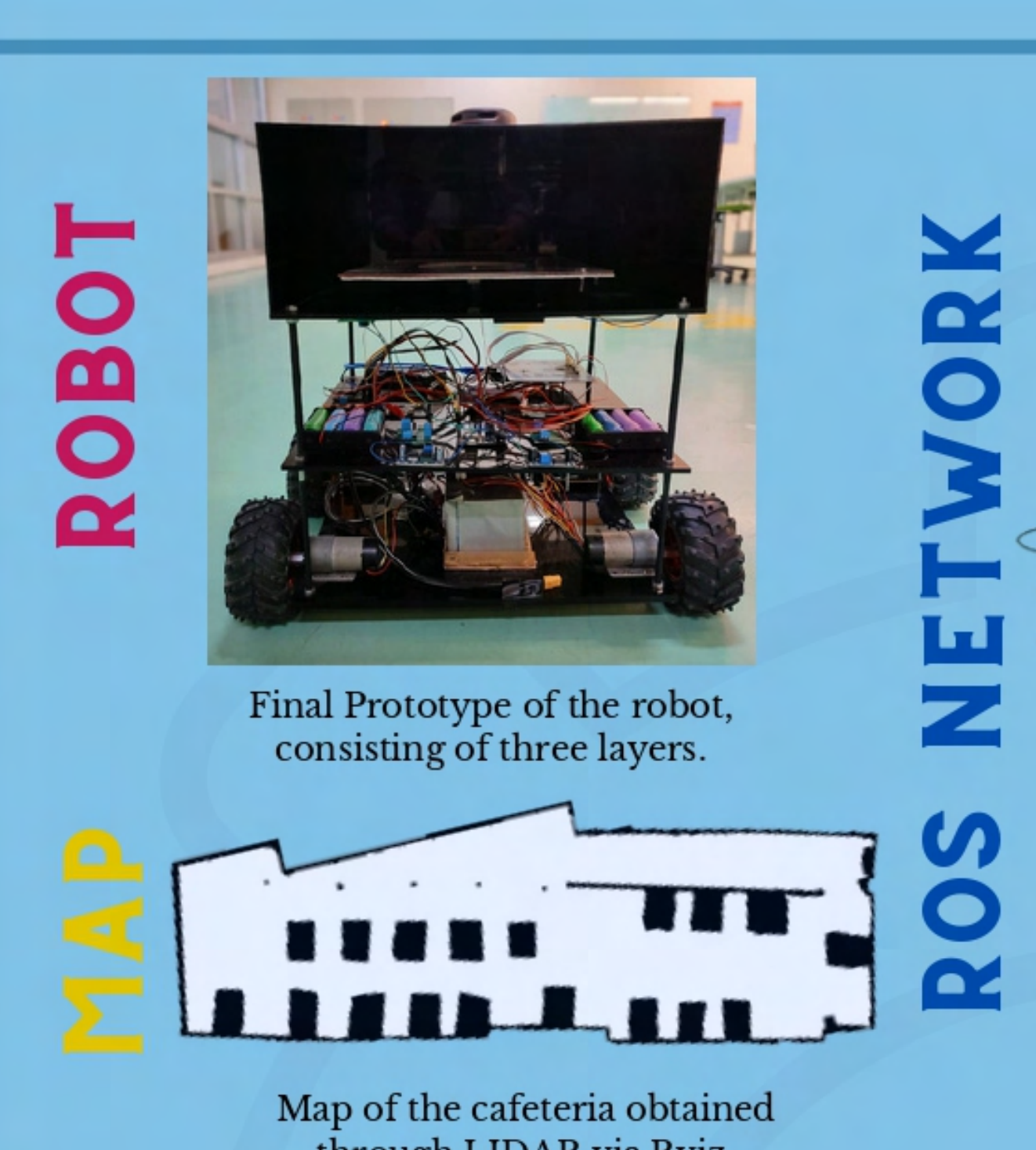
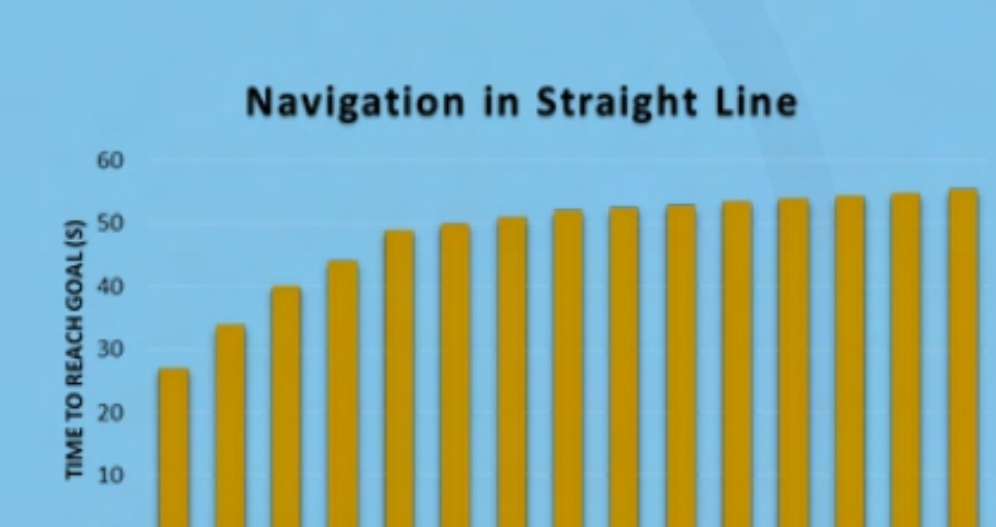
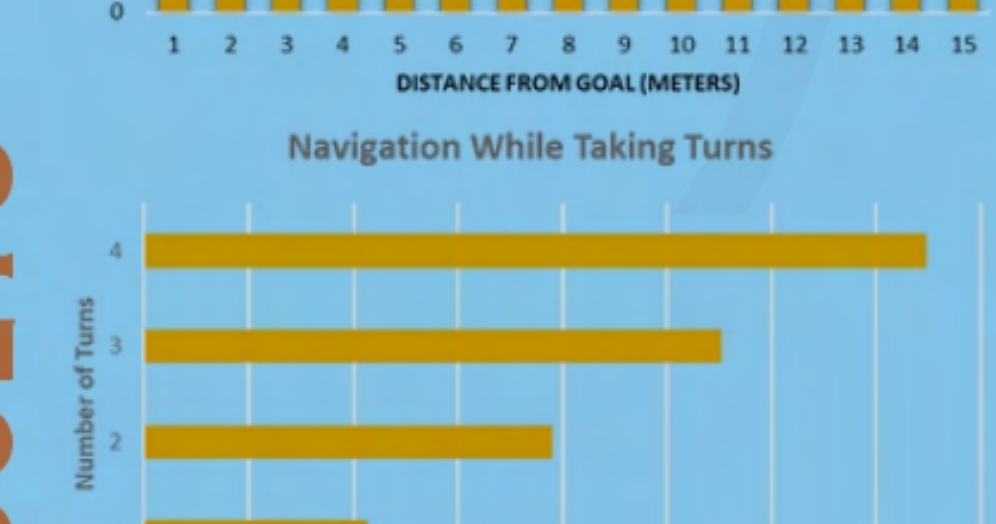
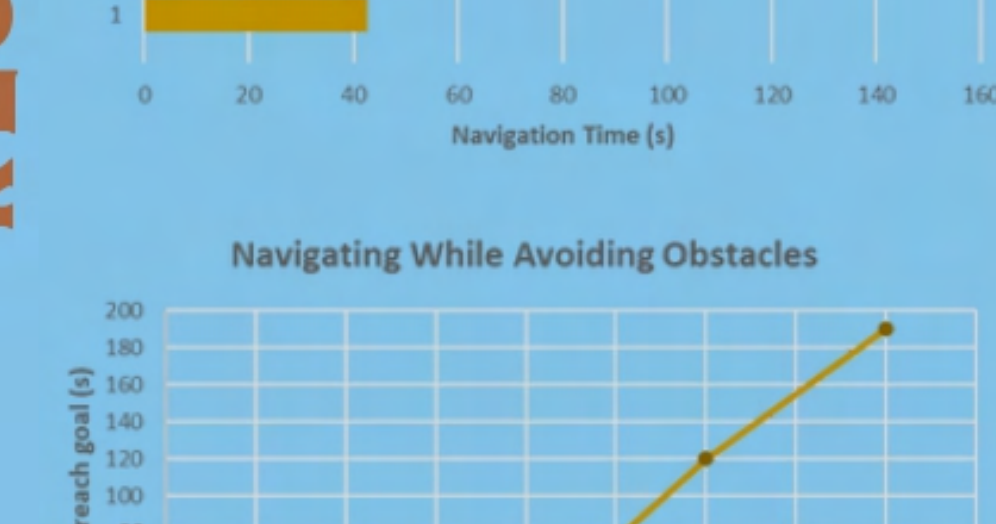
Ahsan Ali | Niha Faisal | Zohaib Zia | Dr. Ishtiyak Makda | Dr. Ahmad Usman

OBJECTIVE	BACKGROUND AND MOTIVATION	PROJECT FEATURES	MATHEMATICAL MODELS	BLOCK DIAGRAMS	
<ul style="list-style-type: none"> Hardware-in-Loop (HIL) demonstration of a closed-loop controlled non-ideal bidirectional DC-DC converter Design and analyze the DC-DC converter using small-signal modeling for the buck and boost modes Design & Implement a discrete PI controller on the FPGA Model and simulate the DC-DC converter in MATLAB Simulink and is interfaced with the FPGA-based controller in a HIL configuration 	<ul style="list-style-type: none"> Designing and controller optimization for the DC & AC converters/inverters used in Electric Vehicles - challenging and slow process High level of complexity and time constraints involved in the hardware designing, assembling, deployment, testing, optimization, and integration with software These limitation have been addressed in recent years with introduction to HIL technique and Rapid Prototyping 	<ul style="list-style-type: none"> Demonstration of a closed-loop controlled non-ideal non-isolated 20kW and 2.4kW isolated bidirectional DC-DC converter Small-signal modeling for the buck and boost modes Discrete PI controller implementation on the FPGA Controller design using the Ziegler Nichols method to eliminate the undesired effects in the transient and steady-state output. FPGA-based controller in a HIL configuration 	<p>NON-IDEAL NON-ISOLATED BIDIRECTIONAL CONVERTER</p> $G_{id,boost}(s) = \frac{V_{in}}{D'} \cdot \frac{(1+sC_1R_C)(1-\frac{sL}{RD^2+R_L})}{s^2LC_1(\frac{R+R_C}{D^2} + s(L+C_1R_L(R+R_C)+D^2RR_C C_2) + 1)}$ $G_{id,buck}(s) = \frac{V_{in}R(1+sC_1R_C)}{s^2LC_1(R+R_C)+s(L+C_1(RR_L+RR_C+R_LR_C))+(R+R_L)}$ <p>IDEAL ISOLATED BIDIRECTIONAL DC-DC CONVERTER</p> $G_{id,boost}(s) = \frac{-2nLI_Ls + 8(1-D)VC - 2nV_{IN}}{n^2CLs^2 + n\frac{L}{R}s + 4(1-D)^2}$ $G_{id,buck}(s) = \frac{2V_{IN}}{CLs^2 + \frac{L}{R}s + 1}$	<p>FIL SETUP FOR 20KW NON-IDEAL NON-ISOLATED CONVERTER WITH HIL PI CONTROL</p>  <p>FIL SETUP FOR 2.4KW IDEAL ISOLATED CONVERTER WITH HIL PI CONTROL</p> 	
ANALYSIS AND RESULTS					
<p>20KW NON-IDEAL NON-ISOLATED BIDIRECTIONAL CONVERTER</p>  <p>Battery Parameters in Bidirectional Mode: Discharging from 0.0.05 sec and 0.05-0.07 sec, Charging from 0.05-0.05 sec</p>  <p>Load Voltage and Current in Bidirectional Mode</p>  <p>Battery Parameters for Load Variation in Boost Mode: 10.125Q for 0.0.05 sec and 15.18Q for 0.05-0.06 sec (50% decrease in load)</p>  <p>Load Voltage and Current variation in Boost Mode</p>	<p>2.4KW IDEAL ISOLATED BIDIRECTIONAL CONVERTER</p>  <p>Battery Parameters in Bidirectional Mode: Discharging from 0.0.05 sec and 0.05-0.08 sec, Charging from 0.05-0.05 sec</p>  <p>Load Voltage and Current in Bidirectional Mode</p>  <p>Battery Parameters for Load Variation in Boost Mode: 10.67Q for 0.0.05 sec and 25.005Q for 0.05-0.08 sec (50% decrease in load)</p>  <p>Load Voltage and Current variation in Boost Mode</p>	<p>CONCLUSION AND FUTURE WORK</p> <p>Using the FPGA-in-loop approach, the paper investigated rapid prototyping of the discrete PI controller for DC-DC Bidirectional Converter for industrial applications. The non-ideal DC-DC converter was designed and simulated in the MATLAB Simulink environment, with the control algorithm running on the FPGA and connected to the MATLAB platform. The research may be expanded to include more advanced control algorithms, such as Sliding Mode and Fuzzy Logic, that are HDL-compatible and can be used on FPGA hardware to examine dynamic and stable states.</p>			<p>REFERENCES</p> <ol style="list-style-type: none"> K. Tytelmaier, O. Husev, O. Valigorskiy and R. Yershov, "A review of non-isolated bidirectional dc-dc converters for energy storage systems," 2016 IEEE International Young Scientists Forum on Applied Physics and Engineering (IYSE), 2016, pp. 22-26, doi: 10.1109/IYSE.2016.775752. S. A. Gajji, H. G. Sahabi, M. Elreabi and A. B. Rad, "Topologies and Control Schemes of Bidirectional DC-DC Power Converters: An Overview," in IEEE Access, vol. 7, pp. 19297-19309, 2019, doi: 10.1109/ACCESS.2019.2929255 H. Al-Shakhk, O. Benouna, G. Hobas and N. Moubayed, "Modeling, design and fault analysis of bidirectional DC-DC converter for hybrid electric vehicles," 2014 IEEE 23rd International Symposium on Industrial Electronics (ISIE), 2014, pp. 1689-1695, doi: 10.1109/ISIE.2014.6864869 Y. Du, S. Lukic, B. Jacobson and A. Huang, "Review of high power isolated bi-directional DC-DC converters for PHEV/EV DC charging infrastructure," 2011 IEEE Energy Conversion Congress and Exposition, 2011, pp. 553-560, doi: 10.1109/ECCCE.2011.6053318. K. Bhatt, R. A. Gupta and N. Gupta, "Average Model of Isolated Bidirectional DC-DC Converter with Auxiliary Isolated Clamp," 2018 8th IEEE India International Conference on Power Electronics (IICPE), 2018, pp. 1-5, doi: 10.1109/IICPE.2018.8709555. A. Fernandez-Arceles, M. Ramirez-Garcia, M. Garcia-Vidalora, J. Lopez and M. Sanz, "Hy/Sw Co-Simulation System for Enhancing Hardware-in-the-Loop of Power Converter Digital Controllers," in IEEE Journal of Emerging and Selected Topics in Power Electronics, vol. 5, no. 4, pp. 1779-1786, Dec. 2017, doi: 10.1109/JESTPE.2017.2739710.

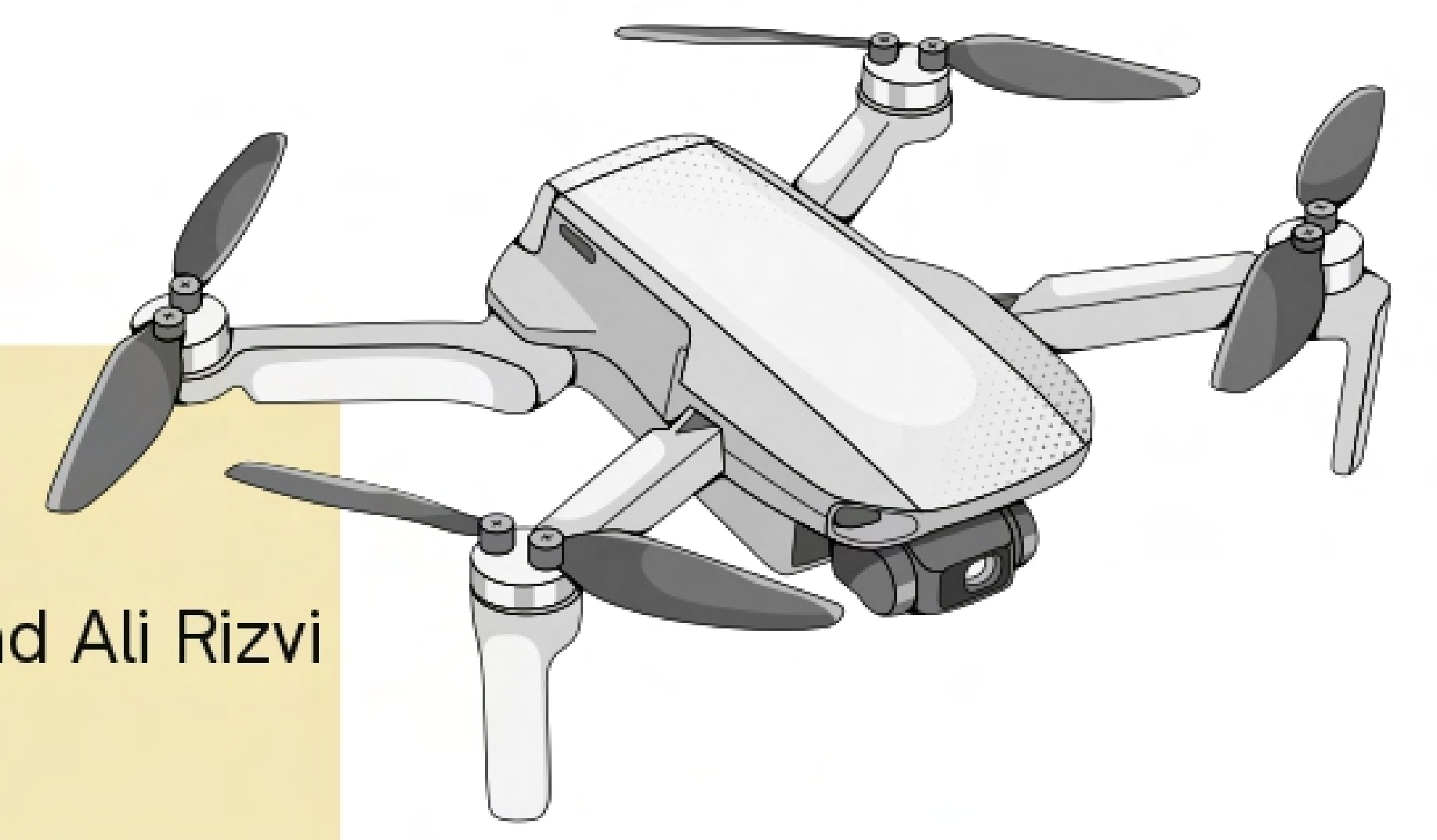


AMAL-AUTONOMOUS DELIVERY ROBOT

Muhammad Ammar Khan | Laraib Aftab Zedie | Muzammil Tariq | Muhammed Abdullah Arif
Advisors: Dr. Muhammad Farhan | Dr. Muhammad Mubeen Movania | Mr. Ghayas Ahmedani

BACKGROUND & MOTIVATION	OBJECTIVE	PROJECT FEATURES	SYSTEM ARCHITECTURE & TECHNICAL DETAILS	PROTOTYPING & RESULTS	FUTURE WORKS
<ol style="list-style-type: none"> The delivery robots market is expected to grow from USD 212 million in 2021 to USD 937 million by 2026. Automation is a key component of Industry 4.0, and it relies on the "Internet of Things" (IoT) to enable it. Reduction in delivery costs and an increase in venture funding are the key factors driving the growth of the market. COVID-19 demanded for contactless delivery which caused a boom in the number of food delivery robots navigating the streets. 	<p>OBJECTIVE</p> <p>"The primary objective is to build an automated delivery system based on the industry 4.0 paradigm, with the motivation of helping small businesses and societies. Our long-term goal is to not only use this framework for food delivery in indoor spaces but to also serve society such as helping disabled people, in hospitals for indoor delivery of medicines, etc.."</p>	<ol style="list-style-type: none"> User-Friendly Application (UI) for customers to order food according to their choice and desire Obstacle avoidance for smooth delivery of the item to the respective customer on time without any hassle. Weight Sensor is used to measure the payload. The value is displayed using a LCD monitor A dashboard for the admins to add in the food items and monitor the order status of all the orders 	<p>SYSTEM ARCHITECTURE & TECHNICAL DETAILS</p>  <ul style="list-style-type: none"> A powerful battery pack with BMS is used to power the robot with recharging capabilities. NVIDIA Jetson Nano is used to make real-time computations for navigation and obstacle detection whilst Arduino controls the motor signals. Camera and LiDAR are used for mapping the environment and identifying the obstacles for the robot while navigating. IMU sensor is being used for better localization using state estimation via extended Kalman filter (EKF) A user friendly application for placing orders in the Tapal cafeteria with options for delivery or takeaway 	<p>PROTOTYPING & RESULTS</p>    	<p>FUTURE WORKS</p> <ul style="list-style-type: none"> Depth-camera can increase the robustness of the robot in terms of the navigation and obstacle avoidance through the fusion with LiDAR. Better localization of the robot on the map so that the robot can effectively comprehend its origin. Safety limits for the weight sensor, to stop the robot from moving incase of any type of overloads. Increased security in the application and on the robot such that the user is verified before the order is handed over to it.

AUTONOMOUS MAPPING AND HUMAN LOCALIZATION FOR INDOOR DISASTER MANAGEMENT UAVS



Authors

Khawaja Ghulam Alamdar, Mehdi Raza Khorasani, Rameen Mobin Ahmed, Syed Muhammad Ali Rizvi

Advisor

Junaid Ahmed Memon

OBJECTIVE

The time from when the disaster strikes till deployment of rescue services is of crucial importance. Most of the time is consumed in the planning of the rescue operation or wasted due to poor planning. Our aim is to aid the first responders to plan their rescue operation using an Autonomous Drone.

The objective of our capstone is to make a quadcopter UAV fully autonomous such that it can be deployed at a disaster site indoors, where it will create a map of the site to help first responders plan the evacuations. The base disaster that we are tackling is an earthquake.

BACKGROUND AND MOTIVATION

Disaster robotics is devoted to enabling responders and other stakeholders to sense and act at a distance from the site of a disaster or extreme incident. Disaster management UAVs have an advantage over conventional means of rescue since they can access areas inaccessible by humans due to difficult terrain or increased risk. UAVs can complement the team of responders to plan and organize rescue operations by performing various functions including but not limited to: providing real time 3D map of the disaster sight, recognize potential human survivors and highlight the rescue hotspots, identify dangerous terrains for the responding teams to avoid and to transport preliminary first aid to victims.

PROJECT FEATURES AND SPECIFICATIONS

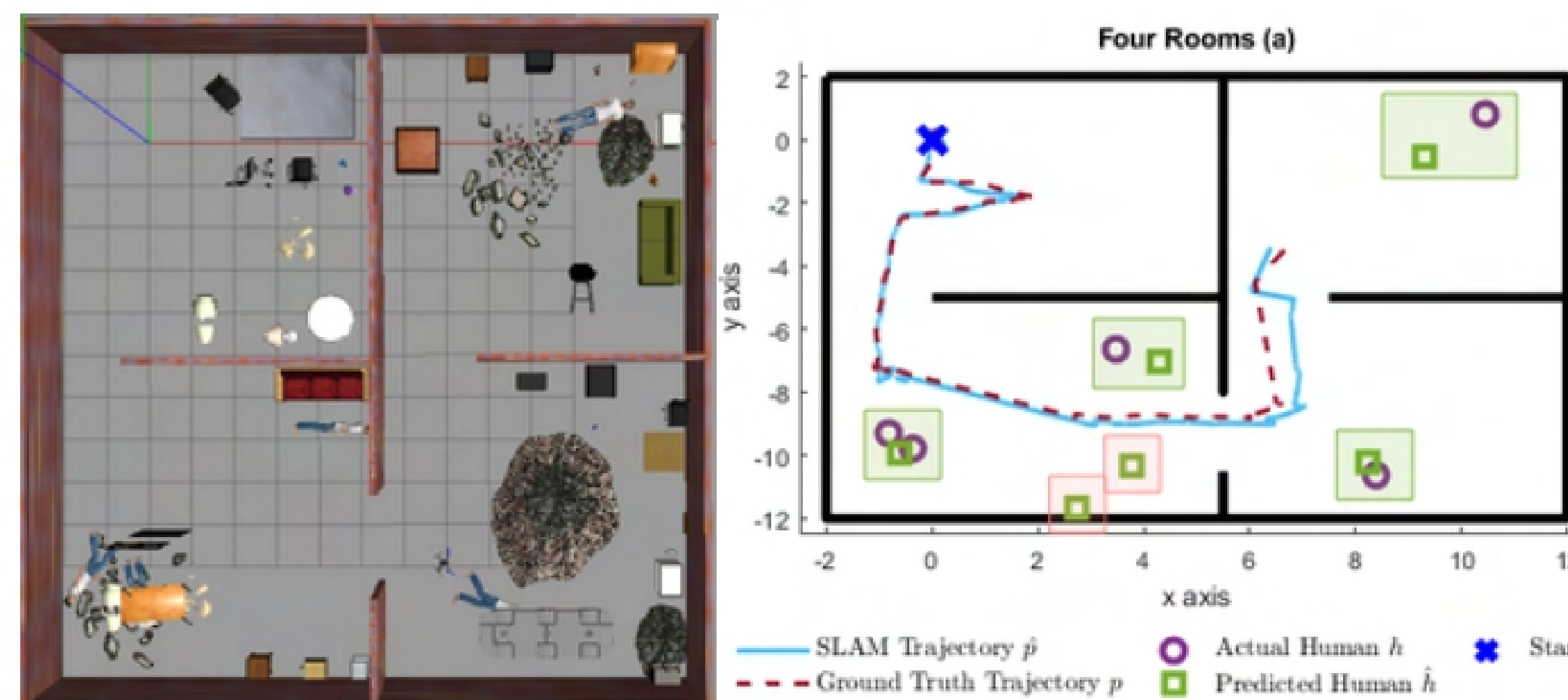
An autonomous drone capable of navigating indoor environments and detecting and localizing human beings.

- Autonomous exploration of unknown environments
- SLAM for localization
- 3D map of environment generated through SLAM
- Humans Detected through YOLO
- Humans Localized using pose of drone from SLAM and depth from RDB-d camera

RESULTS

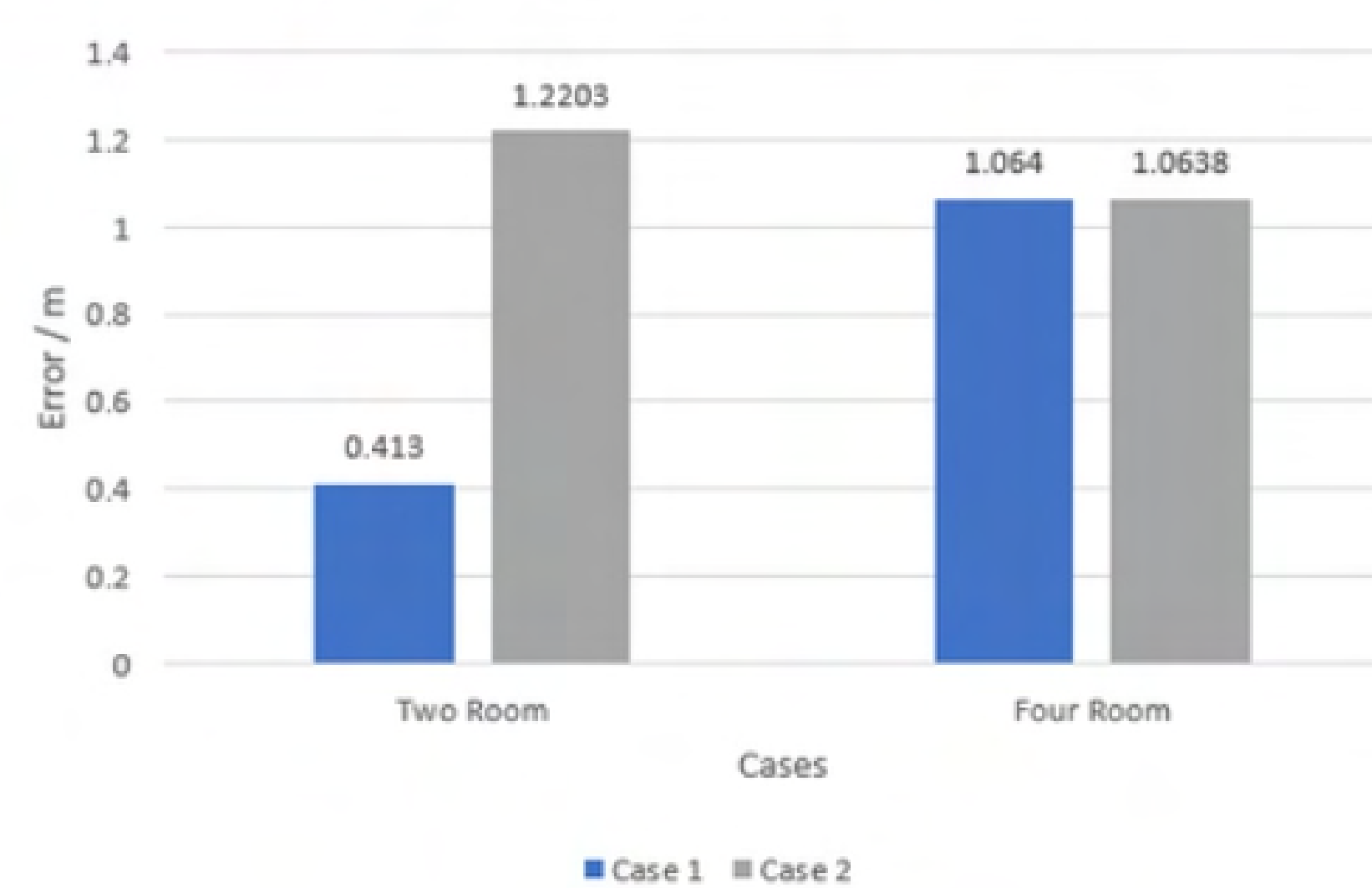
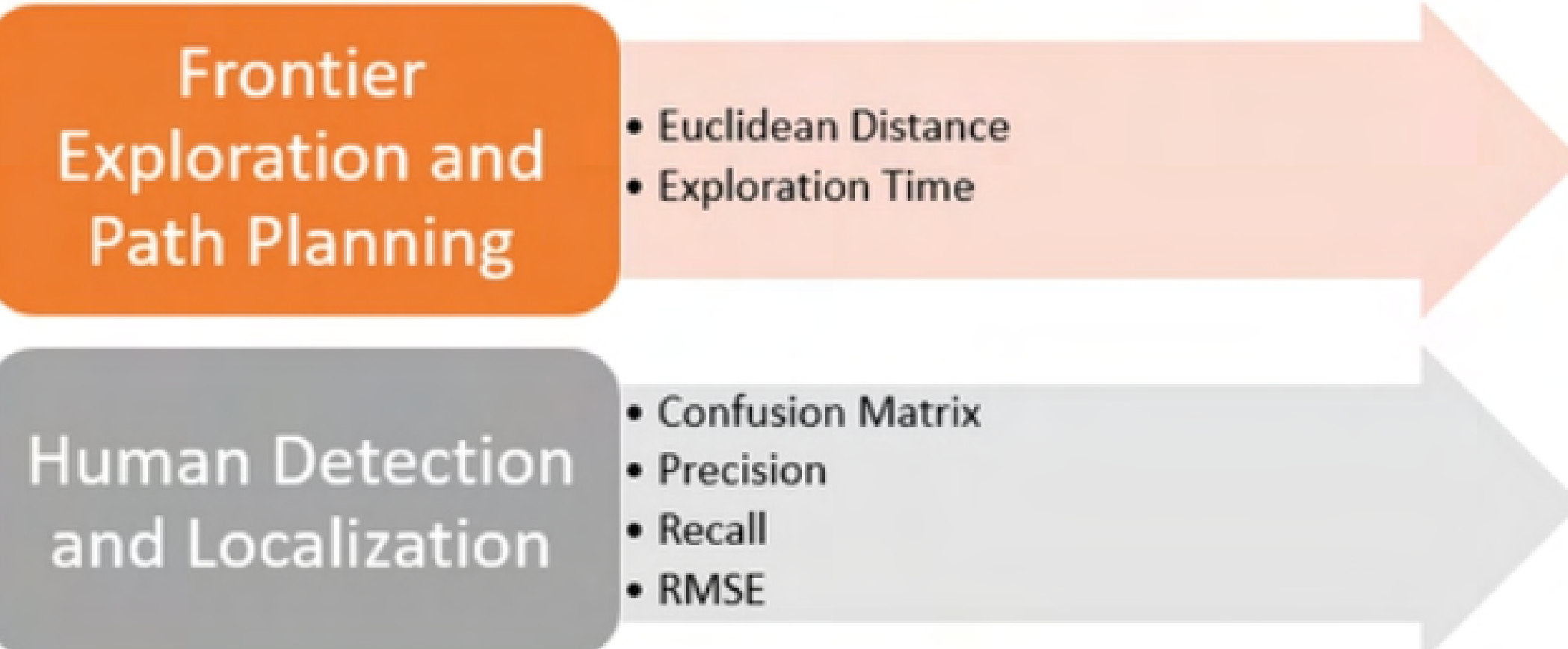
Broadly, there are two main functions performed by the pipeline: Exploration and Path planning, and Human detection and localization. Both these modules are first developed independently. Then they come together with an objective to improve human detection by coupling the Exploration algorithm with the Human detection algorithm

HUMAN DETECTION



Precision	0.6087
Recall	0.875

PERFORMANCE METRICS



CONCLUSION AND FUTURE WORK

The results show that the end-to-end project is capable of achieving its goal of gaining relevant information from a disaster site that can be forwarded to first responders to aid them in planning evacuations.

Future work includes:

- Upgrading exploration stack to 3 dimensions
- Using a swarm of UAVs for faster coverage
- Multi-sensor approach to include disasters such as fires and extremely dark environments.

BLOCK DIAGRAM

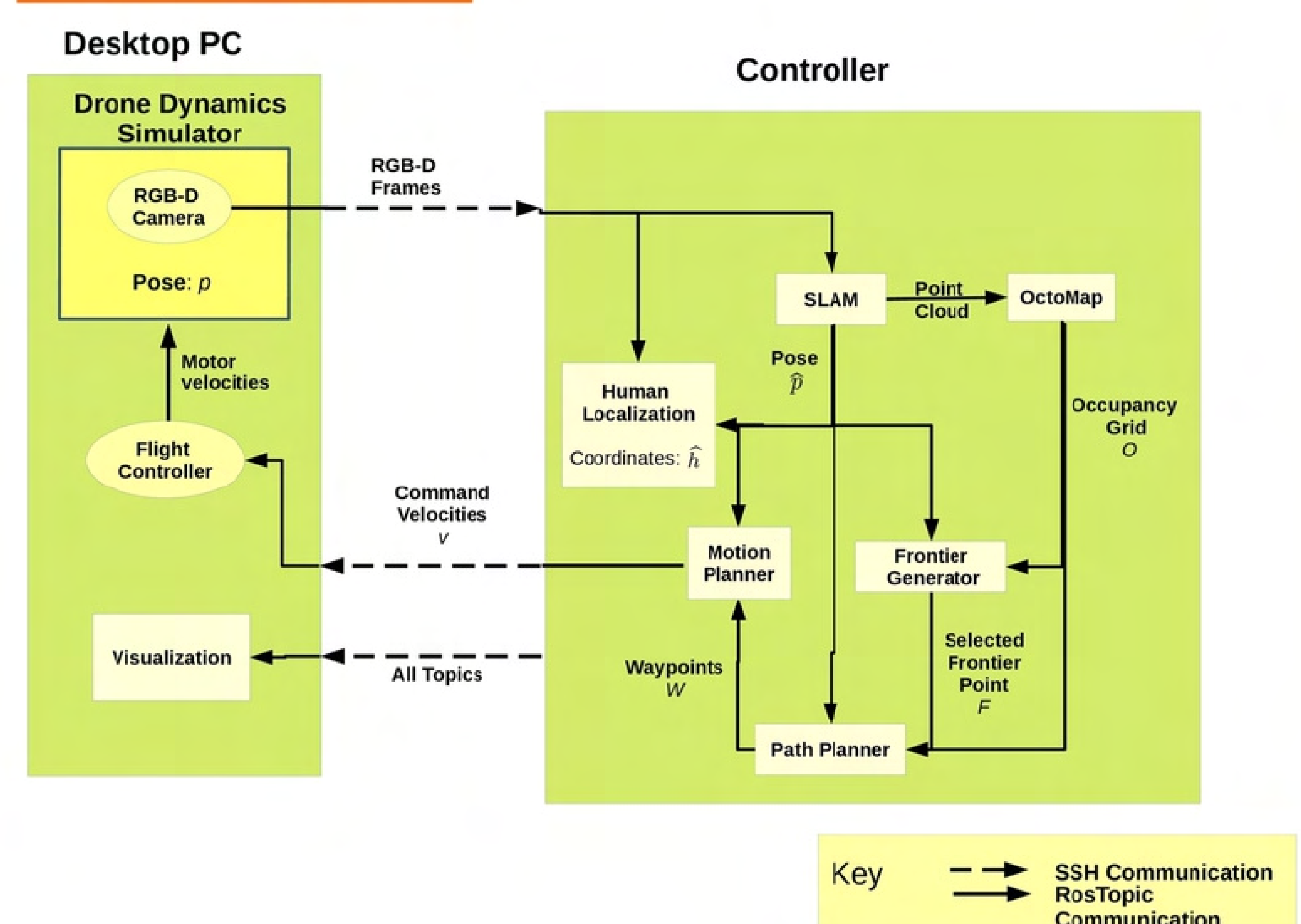




FIG 1.1: WEBSITE DESIGN FOR SAAYA CORPORATION

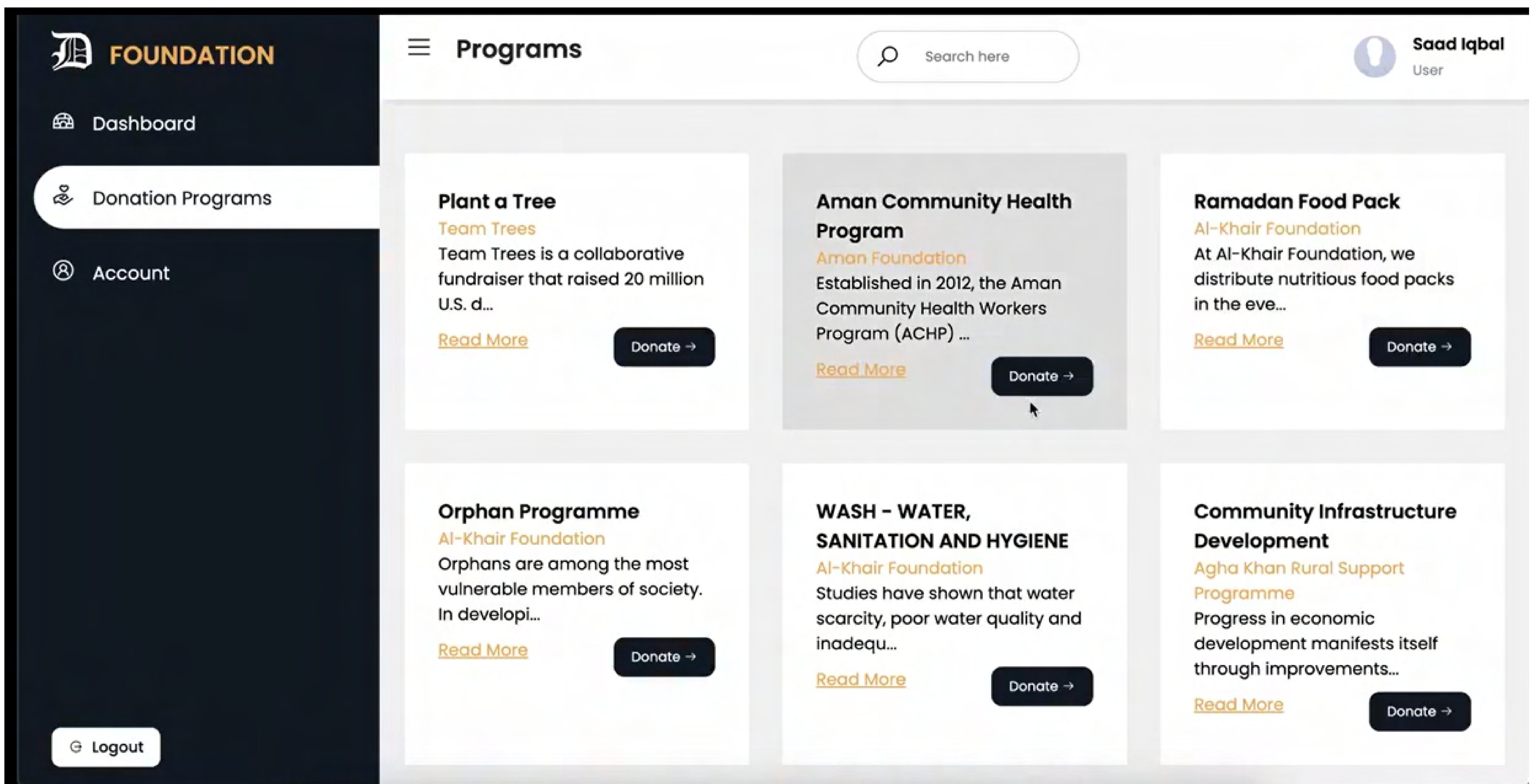


FIG 1.2: DIGITARO FOUNDATION'S DONATION PORTAL

“Khidmat” is a non-credit graduation requirement for all computer science majors, but it's more than just a box to check off. It can be an opportunity for you to use your skills to make a real difference in society. In Khidmat, CS students collaborate with external non-profit organizations on a social cause project that requires their computer science expertise. Khidmat allows students to gain hands-on experience by applying their knowledge to real-world problems. A student has to dedicate at least 40 hours to the project to fulfill the requirement (in the case of a group project, the requirement is 40 hours for each member). This experience will not only benefit the community but also enrich students' personal and professional development. The students have worked with more than 50+ organizations and more than 100+ projects in the last 3 years including Akhuwat Foundation, SMBB Institute of Trauma, Green Crescent Trust, Sindh Educational Foundation, Hussaini Foundation, World Wildlife Fund, The Citizen Foundation, and Zindagi Trust.

RESEARCH PUBLICATIONS

Below are the research publications by DSSE faculty from the period from August 2021 to December 2022. Students are Highlighted in **Orange**.

NAME	PROGRAM	RESEARCH PAPER AND PUBLICATIONS
Junaid Ahmed Memon	ECE	<p>Paper entitled: "IoT Enabled Real-time Energy Monitoring and Control System," by the 9th International Conference on Smart Grid: https://www.icsmartgrid.org</p> <p>Paper titled "Project-based Learning for Control Education during Covid-19 Pandemic " has been accepted in IFAC's 13th International Symposium on Advances in Control Education, ACE 2022 (https://ace2022.org/). The paper is compiled by Ms. Aiman Najeeb (ECE RA) and himself.</p> <p>Paper titled "Design and Implementation of Smart Flowmeter for Urban Water Metering " has been accepted in 48th Annual Conference of the Industrial Electronics Society-IECON (https://iecon2022.org/).</p>
Dr. Muhammad Farhan	ECE	<p>Muhammad Ammar Khan, Khawaja Ghulam Alamdar and Aiman Junaid, "Mitigating the Zero Biased Steering Angles in Self-driving Simulator Datasets" in 17th International Conference on Computer Vision Theory and Applications 2021 (VISAPP https://visapp.scitevents.org/).</p> <p>Published a study in the Journal of International and Intercultural Communication. de Souza, R., & Hussain, S. A. (2021). "Howdy Modi!": Mediatization, Hindutva, and long distance ethnonationalism. Journal of International and Intercultural Communication, 1-24.</p> <p>Paper titled: "Sim-to-Real Transfer for Object Detection and Localization on Animals" in the workshop: "CV4Animals: Computer Vision for Animal Behavior Tracking and Modeling" held under the umbrella of the IEEE Computer Vision and Pattern Recognition Conference, June 25th.</p> <p>Paper entitled: "Satellite Image Future Landscape Prediction Using Conditional Adversarial Networks," presented at the 2021 IEEE International Geoscience and Remote Sensing Symposium, July 12th - 16th. The work on this paper was initially carried out as a course project in the Spring 2020 iteration of EE452 Computer Vision and was later continued until its submission in January 2021. https://www.igarss2021.com/</p> <p>S. M. A. Alam, M. Ul Huda, and M. Farhan, "Alpha-trimmed mean filter and XOR based image enhancement for embedding data in image," in Proceedings of IEEE International Conference on Visual Communications and Image Processing (VCIP) 2021.</p>
Dr. Tariq Mumtaz	ECE	<p>Paper titled: Inter-slice resource management for 5G Radio Access network using markov decision process</p> <p>Ali, Yousuf Moiz, Arsalan Ahmed, and Tariq Mumtaz. "Machine Learning for Improved Resource Block Detection in 4G LTE Cognitive Radio Networks." In 2021 International Mobile, Intelligent, and Ubiquitous Computing Conference (MIUCC), pp. 169-175. IEEE, 2021</p>
Dr. Abdul Samad	CS	<p>Publishing a conference paper: Image Segmentation for Autonomous Driving Using U-Net Inception Syed Muhammad Fasih Hussain, Syed Muhammad Hamza, Abdul Samad 2022 7th International Conference on Signal and Image Processing (ICSIP)</p> <p>Publishing a book chapter: Exploring the Mozilla® Hubs® platform for Virtual Final Year Project Exhibition Muhammad Mobeen MOVANIA and Abdul SAMAD and Syeda Saleha RAZA, MREdu2022: Mixed Reality for Education, Springer</p>

RESEARCH PUBLICATIONS

NAME	PROGRAM	RESEARCH PAPER AND PUBLICATIONS
Dr. Muntazir Abidi	iSciM	His recent publication: Title: Robust Simulation-based Inference in Cosmology using Bayesian Neural Network Accepted by International Conference on Machine Learning (ICML) for Astro 2022. Link of the conference: https://ml4astro.github.io/icml2022/ Link of the paper: https://arxiv.org/pdf/2207.08435.pdf Published in collaboration with Cosmology x Data Science Group, Flatiron Institute in New York
Dr. Aamir Hasan	ECE	The following article was published in the Elsevier Journal of Computers and Electrical Engineering, vol. 102, Article 108243, Sep, 22. Authors - Adnan Fazil, A. Hasan, Bahman R. Alyaei, Khurram Khan and Muhammad Zakwan , "A proactive Medium Access Control (MAC) for finite-sized machine-to-machine (M2M) communication networks".
Dr. Neelma Bhatti	CS	Her new paper titled " Intimate Narratives: An Assets-Based Approach To Develop Holistic Perspectives of Student Mothers' Lives and Their Use of Technology in Parenting" accepted at the 25th ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW'22), which will also appear in Proceedings of the ACM on Human-Computer Interaction (PACM HCI) Journal.
Dr. Faisal Alvi	CS	F. Alvi, H. Algafri, N. Alqahtani, Style Change Detection using Discourse Markers, Conferences and Labs of the Evaluation Forum (CLEF 2022) Labs and Workshops, 5–8 September 2022, Bologna, Italy, http://ceur-ws.org/Vol-3180/paper-188.pdf . The work was presented by KFUPM UG students on September 06 (please see the schedule at https://pan.webis.de/clef22/pan22-web/index.html)
Dr. Humaira Qureshi	Iscim	Phylogenetic Analysis of SARS-CoV-2 variants of concern (VOC) from Karachi, Pakistan by Javeria Samad, Humaira Qureshi, Safina Razzak, Syed Hani Abidi 1. Aga Khan University, 2. Habib University Accepted for poster presentation at American Society for Microbiology (ASM) Microbe conference, which was held in Washington DC, USA, from June 9 - 13, 2022
Dr. Shafayat Abrar	ECE	Shafayat Abrar, Azzedine Zerguine, and Karim Abed-Meraim: Adaptive Algorithms for Blind Channel Equalization in Impulsive Noise. Elsevier Signal Processing. 2022. DOI: 10.1016/j.sigpro.2022.108626
Dr. Farhan Khan	ECE	Farhan Khan & S. K. Nguang, "Distributed Localization Algorithm for Wireless Sensor Networks using Range Lookup and Stitching of Sub-Regions," IET Wireless Sensor Systems, Oct. 2021, Vol. 11, Iss. 5, pp. 179-205. (IET WSS CITE SCORE: 5.2)
Dr. Ishtiyag Makda	ECE	Ishtiyag Ahmed Makda "Comparison of Common-Mode EMI Noise in Hard-switched and Phase shifted Forward Converter" 23rd EPE-ECCE Europe 2021 International 2021 https://ieeexplore.ieee.org/document/9570698

RESEARCH PUBLICATIONS

NAME	PROGRAM	RESEARCH PAPER AND PUBLICATIONS
Dr. Haleema Qamar	ECE	<p>H. Qamar, H. Qamar, N. Korada and R. Ayyanar, "Control and Performance of 240°-Clamped Space Vector PWM in Three Phase Grid-Connected Photovoltaic Converters under Adverse Grid Conditions," in IEEE Transactions on Industry Applications, 2022, doi: 10.1109/TIA.2022.3192507. (IF 4.079).</p> <p>H. Qamar, H. Qamar, N. Korada and R. Ayyanar, "240°-Clamped PWM Applied to Transformerless Grid Connected PV Converters with Reduced Common Mode Voltage and Superior Performance Metrics," in IEEE Open Journal of Power Electronics, doi: 10.1109/OJPEL.2022.3155053.</p> <p>H. Qamar, H. Qamar and R. Ayyanar, "Performance Analysis and Experimental Validation of 240°-Clamped Space Vector PWM to Minimize Common Mode Voltage and Leakage Current in EV/HEV Traction Drives," in IEEE Transactions on Transportation Electrification, vol. 8, no. 1, pp. 196-208, March 2022, doi: 10.1109/TTE.2021.3108957.</p>
Dr. Ahmad Usman	ECE	<p>Sohail, Abeer, Rashna Khan, Syed Hammad Mukhtar, Aiman Najeeb, and Ahmad Usman. "Effects of uncoordinated electric vehicle charging on a distribution network." In 2022 19th International Bhurban Conference on Applied Sciences and Technology (IBCAST), pp. 591-597. IEEE, 2022.</p> <p>Ali, Ahsan, Niha Faisal, Zohaib Zia, Ishtiyag Makda, and Ahmad Usman. "Rapid Prototyping of Bidirectional DC-DC Converter Control using FPGA for Electric Vehicle Charging Applications." In 2022 IEEE 13th International Symposium on Power Electronics for Distributed Generation Systems (PEDG), pp. 1-6. IEEE, 2022.</p> <p>Akbar, Hussaina Ali, Anusha Rehman, Zeeshan Karim, Ahmad Usman, and Syed Hasan Asim. "Deep Learning based Inverse Design of Integrated Silicon Nanophotonic Gratings." In The European Conference on Lasers and Electro-Optics, p. jsiv_p_1. Optica Publishing Group, 2021.</p> <p>Akbar, Hussaina Ali, Anusha Rehman, Zeeshan Karim, Ahmad Usman, and Syed Hasan Asim. "Deep Learning enabled Forward Modeling and Inverse Design of Integrated Nanophotonic Gratings." In Laser Science, pp. JTh5A-100. Optical Society of America, 2021.</p>

COMMUNITY CONTRIBUTIONS

DSSE faculty contribute to their social and academic communities in diverse ways. Below is a list of such contributions from the period from August 2021 to December 2022. Student contributions are highlighted in Orange.

NAME	PROGRAM	ACHIEVEMENTS
Dr. Waqar Saleem	CS	<p>For his participation in the MS Thesis/Project final defense session at FAST-NU as an external jury member in June.</p> <p>Participated in "Roundtable: Skilled HR Development" at P@SHA ICT Awards 2021 on 23 October 2021; https://0b7ca308-7375-4b75-b223-709026559563.filesusr.com/ugd/a7a7e7_fa4d3302866349738b2b9dd9b6c9aa84.pdf</p> <p>Moderated a panel on "Future of Education and the Role Games Play" at Epiphany GameX conference on 10 November, 2021: https://www.facebook.com/epiphanypk/posts/30684961834729113</p> <p>Hosted a DSSE Public Lecture Series on "Remote Social Sensing" on 24 November, 2021: https://www.facebook.com/HUDSSE/videos/434853964705388</p>
Dr. Muhammad Farhan	ECE	<p>For the presentation of his research paper (accepted in June 2021) - "An autonomous robotic system for collecting garbage over small water bodies," in the proceedings of the 6th IEEE International Conference on Automation, Control and Robotics Engineering (CACRE) 2021.</p>
Dr. Abdul Samad	CS	<p>Participating in talk "Mathematical Foundations of Machine Learning". June 20th, 2022. STEM Undergraduate Workshop sponsored by British Council Pakistan "HIGHER EDUCATION IN PAKISTAN: WHERE DO WE STAND?" panelist: Quetta Literary Festival 2022</p> <p>Participating in technical program committee: 2022 7th International Conference on Signal and Image Processing (ICSIP)</p>
Dr. Anzar Khaliq	iSciM	<p>He spoke at the Times World Conference on July 29th 2022 held at Sorbonne University in Paris as an Invited Speaker on the Topic "Can we construct Life Experiences without Living Them". The abstract for the talk is available on this link</p>
Dr. Faisal Alvi	CS	<p>F. Alvi, H. Algafri, N. Alqahtani, Style Change Detection using Discourse Markers, Conferences and Labs of the Evaluation Forum (CLEF 2022) Labs and Workshops, 5–8 September 2022, Bologna, Italy, http://ceur-ws.org/Vol-3180/paper-188.pdf. The work was presented by KFUPM UG students on September 06 (please see the schedule at https://pan.webis.de/clef22/pan22-web/index.html)</p>
Dr. Owais Talat	ECE	<p>Waleed Bin Khalid, Amna Anwar and O.T. Waheed, "Contactless Vitals Measurement Robot," in 8th International Conference on Automation, Robotics and Applications (ICARA 2022), 18-20 Feb 2022, Prague, Czech Republic.</p> <p>Served as the member of Technical Program Committee for International Conference on Automation, Robotics and Applications (ICARA 2022) [http://www.icara.us/committees.html].</p>

COMMUNITY CONTRIBUTIONS

NAME	PROGRAM	ACHIEVEMENTS
Dr. Humaira Jamshed	iSciM	<p>Research in: Humaira Jamshed, Jamshed Arslan, Amber Talat “Personalized Dietary Assessment and Meal Plan for Students” American Society of Nutrition 2021 Infographic Competition (attached)</p> <p>Research in: Jamshed Arslan, Arooj Shafiq, Humaira Jamshed “Comparison of spike protein gene sequence between Pakistani and mutant strains of SARS-CoV-2” Intelligent Systems for Molecular Biology and the European Conference on Computational Biology (attached)</p> <p>Research in: Ali Hamza, Maham Patel, Muhammad Usaid Rahman, Haris Ladhani, Humaira Jamshed “PPI prediction through ensemble clustering and dynamic PPI networks” Aga Khan University Biological Sciences Research Symposium available at Aga Khan University - EPosters</p> <p>Research in: Humaira Jamshed, Umema Zehra, Muhammad Aquib Yousuf, Muhammad Areeb Kazmi, Jamshed Arslan “Infectious diseases in adolescents – Role of food and nutrition literacy” CNS/SCN Advances in Nutrition & Immune Function (attached)</p> <p>She has been invited to the Annual LEAD convention 2022 as a panelist for Female Leadership in STEM, happening on the 14th and 15th of May, 2022 at The Royale Rodale, arranged by SZABIST.</p> <p>Two of her Tehqiq Summer Research Proposals have been accepted for 2022: Research Project #1: Youth Health – Research, Education, and Public Outreach Research Project #2: Medicinal Effects of Almonds – Perception vs Science</p> <p>Scientific contribution: Jamshed, Arslan, Arooj Shafique, Humaira Jamshed. Linking Nutrition literacy and lack of exercise with the feeling of anxiety, loneliness, poor sleep, and malnutrition – Survey of 240 young adults. Pakistan Nutrition and Dietetic Society Second International Conference 2022</p> <p>Scientific contribution: Humaira Jamshed, Muhammad Kazmi, Muhammad Yousuf, Umema Zehra, Jamshed Arslan. Lack of Nutrition Awareness and factors affecting student food choices. Canadian Nutrition Society Annual Conference 2022</p> <p>Scientific contribution: Humaira Jamshed, Jamshed Arslan Loneliness, Emotional Eating, and COVID19 in Youth. Nutrition 2022 Annual Conference, American Society of Nutrition</p> <p>Scientific contribution: Humaira Jamshed, Jamshed Arslan, Arooj Shafique. Higher Nutrition Literacy is Associated with Better Mental Health in Youth. Society for Nutrition Education and Behavior. Annual Conference 2022</p> <p>As a field expert, the American Nutrition Society invited her to judge 16 Abstracts submitted for consideration in the Nutrition 2022 Annual Conference.</p> <p>Presented research on Nutrition Literacy and Youth Mental Health at the annual conference by the Society of Nutrition Education and Behavior in Atlanta, GA, USA Higher Nutrition Literacy is Associated with Better Mental Health in Youth – Journal of Nutrition Education and Behavior ScienceDirect</p>

COMMUNITY CONTRIBUTIONS

NAME	PROGRAM	ACHIEVEMENTS
Dr. Aamir Hasan	ECE	<p>Delivered an invited talk “The Art of Writing a Thesis – a case study” at the Pakistan Air Force Air War College Institute (AWCI) on 5 th August 2022</p> <p>Joined as a Board Member at Meethi Zindagi (https://meethizindagi.org/). Meethi Zindagi, being the flag bearers for the diabetes community throughout Pakistan, works for bringing the sweetness back to the lives of people with diabetes through Awareness, Education, Empowerment and Support! Their extensive awareness and peer support programs are changing what it means to live with diabetes.</p> <p>Joined as a Board Member at Institute of Emerging Careers (https://iec.org.pk/). IEC is a platform where leading academicians, entrepreneurs and technologists with global experience come together to transform the livelihood of hundreds of underprivileged adults through scalable and quality training in emerging careers over the next five to ten years.</p>