

# COMPUTER SCIENCE

FORMAN CHRISTIAN COLLEGE



## ABOUT THE DEPARTMENT

The Department of Computer Science is located in the S-Block, Floor 2-3. It is offering BS and MS programs in Computer Science. Every year about 150 students graduate from the department. Our alumni are currently serving at prestigious organizations locally and internationally. Many of our students are enrolled in PhD programs in internationally ranked universities. We are actively expanding our collaborations with the industry to better align our programs with the industry demand.

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# WELCOME NOTE



Welcome to the 2020-21 edition of the Department of Computer Science's annual newsletter. We are happy to get back in touch with you. Over the past year, our students have been acknowledged at international forums, presenting papers at prestigious conferences, getting admissions at top-notch universities abroad, and doing internships and jobs at the best organizations in the country. Our faculty members have also continued to further strengthen themselves professionally by pursuing PhD and Post-Doc programs, consequently enriching the department with their contemporary knowledge and experience. We have also developed linkage with the industry and are consolidating it by means of formal MOU's.

This has been quite the trying year for our students, faculty, and yourselves but we are working our way through it. Due to the ongoing pandemic, we have had to adjust to teaching and working online. While a challenge, it also has opened opportunities to implement new technologies and teaching techniques. I am particularly proud of the dedication and ingenuity of our faculty in digitally delivering their courses, as well as the perseverance and commitment of our students in an online learning environment. Our mission is always to serve the interests of our students and that has not changed despite the challenges.

I'm incredibly proud of all that the department has achieved over the past year in the face of significant challenges: sustained student growth, limited resources, and of course, COVID-19. Given the department's very talented faculty, staff, and students; the sustained support of the Dean's office and FCC administration more generally; and our dedicated alumni, I know the department has even greater things in its future.

I hope you will enjoy our newsletter and share our highlights with friends, colleagues, and family. I express our deepest gratitude for your continuing support and interest in our efforts and accomplishments.

Aasia Khanum  
Professor and Chair  
Department of Computer Science

# STUDENT ACHIEVEMENTS

## UNDERGRAD RESEARCH



Senior students Rosheen Tahir, Muhammad Shaaf Imran and Haider Raza Gadi successfully completed their Senior Project titled “Brick Kiln Detection and Localization using Deep Learning Techniques” aimed at automatic detection and localization of brick kilns in satellite images by the implementation of Deep Learning Techniques to aid the government to take action against forced labour and environmental pollution. An artificially intelligent model was trained to automatically detect and create a bounding box around the kilns in satellite images from the South Asian brick belt. Their work was accepted for publication in International Conference on Artificial Intelligence (ICAI), pp. 37-43. IEEE, 2021, where they presented virtually. The students were supervised by Dr. Sidra Minhas and Dr. Nosheen Sabahat.

## Brick Kiln Detection and Localization using Deep Learning Techniques

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**Abstract**—Brick kiln areas being home to practices of forced labor and environmental pollution are difficult to detect. This paper explores the automatic detection and localization of brick kilns in satellite images by the implementation of Deep Learning Techniques to aid the government to take action against forced labour and environmental pollution. An artificially intelligent model was trained to automatically detect and create a bounding box around the kilns in satellite images from the South Asian brick belt. The experimentation started with the use of basic convolutional neural networks to identify kilns in an image and then progressed to the

plaster and lime concrete. Thus, bricks are an integral part of the construction industry in Pakistan.

The brick belt in South Asia which runs through Afghanistan, Pakistan, India, Bangladesh and Nepal consists of many traditional brick kilns which are used in the production of bricks. The manufacturing process is highly labor intensive and kiln owners often use forced labor on the manufacturing site. The term forced labor is coined to include child labor, enslaved workers and all forms of bonded labor.



# STUDENT ACHIEVEMENTS

## GRADUATE RESEARCH

MS student Muhammad Arfan has received a certificate and an award on 3rd August 2021 from Punjab Thermal Power (Private) Limited on publishing a research paper "Impacts of COVID-19 on Power Sector and The Role of ICT", in IEEE 23rd International Multitopic Conference (INMIC), 2020.

The student's advisor Dr. Nosheen Sabahat was invited at the award ceremony to receive a souvenir as an appreciation from the CEO of Punjab Thermal Power (Private) Limited Lahore. All the members of the organization were invited to give them a round of applause. At the event Dr. Nosheen discussed with the CEO that FCC and PTPL should work in collaboration in future to come up with industry collaborative research for the reason that we have very talented students, and this should be highlighted and encouraged.



# STUDENT ACHIEVEMENTS

## HONOR AT GOOGLE



We are proud to announce that Saad Muzzafar, a sophomore student in our department, has been selected as a Google Developer Student Club Lead.

Here's what he has to say about this achievement: "Being a part of a global community of passionate developers has always been a dream of mine. So, after a rigorous application and interview process, I am humbled to be selected as a Google Developer Student Club Lead and will be representing FCCU! I'm absolutely thrilled to be enrolled in an engaging atmosphere where his untimely passing in December 2016 I'm challenged to do my best while also ensuring that I take my peers alongside me as I try to learn something new every day."

We wish Saad Muzzafar all the best as he undertakes this responsibility!

# STUDENT ACHIEVEMENTS

## SCHOLARSHIP FROM AWS/UDACITY



Amazon Web Services (AWS) and Udacity have collaboratively started a scholarship program to teach valuable Machine Learning skills to developers. We are pleased to note that our student Sumera Shafi has been selected for the scholarship. Currently she is undergoing training which will prepare her for highly in-demand positions in the future. Reflecting on her experience, she says:

“I developed interest in Machine Learning as a specialization of Artificial Intelligence when I studied a course on AI at FCC. When my Professor shared this opportunity with the class, I was more than happy to apply. There

are so many real life practical examples being taught which is making me more intrigued as I am moving further in the program. Also, I am realizing the importance of ML; the way it is creating rapid and exciting changes across all levels of society. So happy to receive such a great opportunity to learn more about AI/ML.”

We wish Sumera Shafi more success in her future endeavors!

# ALUMNI SPOTLIGHT

## ALUMNI PLACEMENT

Our alumni are working at renowned software houses and many are pursuing higher studies. Outline below are a few noteworthy ones.

- o Muhammad Sulaman Toor is working at Canadian Emirates.
- o Muazam Husnain is working at Arbisoft
- o Muhammad Saad shafiq is working at Systems Ltd.
- o Mahfroze Ghouri is working at Affiniti.
- o Ali Bilal is working at Kualitatem.
- o Muhammad Tayyab is working at Binary Tech.
- o Bashair Asad Mahmood is working at Confiz
- o Muhammad Mumtaz Ali is research scholar at Zhengzhou University, Henan, China

## ALUMNI AMBASSADORS

In the spirit of strengthening the professional network for our students and alumni, the Department of Computer Science (DCS) has initiated a “DCS Alumni Ambassador Program”.

This program is focused at building a favorable environment for our students at various relevant hiring organizations. We proudly introduce to you our selected Ambassadors who are working at different organizations and have shown willingness to help our current students.







**FORMAN CHRISTIAN COLLEGE**  
(A CHARTERED UNIVERSITY)

**Department of Computer Science**

warmly welcome

**DCS ALUMNI AMBASSADORS**



**Abdullah Nafees**  
Health Axle



**M. Ahmed Tariq**  
Technology Castle



**Agha Daniyal Tariq**  
On Sets



**Muhammad Tayyab**  
Binary Tech



**Abubakar Siddique Bhatti**  
Autosoft Dynamics



**Mahfroze Ghouri**  
Afiniti



**M. Saad Shafiq**  
Systems Ltd.



**Ali Bilal**  
Kualitatem



**Muhammad Sulaman Toor**  
Canadian Emirates



**Muhammad Abdullah**  
Ibex Global



# ALUMNI SPOTLIGHT



**M. Saad Shafiq**

**Junior Consultant  
Development**

**Systems Ltd**

"My experience at FCC provided me with invaluable opportunities, allowing me to develop technical skills. I honed these skills over the years in university and have been using them since.

Graduating from FCC and stepping into the industry made me realize the importance of work ethic training that I received as a student. Constant skill development is just as important in the industry as it was in college due to never-ending challenges. Systems encouraged me to face challenges upfront and maneuver through challenges on my own, resulting in self-confidence and problem-solving skills. The sheer hard work ethic has been my closest ally during these years.", China



# FACULTY SPOTLIGHT

## PROFESSIONAL HONOR

AASIA KHANUM

PROFESSOR  
CHAIRPERSON



Dr. Aasia Khnum is a Professor of Computer Science at FCC. Her research interests include Software Engineering, Artificial Intelligence, Digital Image Processing, and Data Mining. Her research includes developing intelligent processing tools for facial expression analysis, medical image analysis, and plant health analysis. She has published over 60 articles in peer-reviewed conferences and journals and has served on the review panel of several international conferences and journals. She has received the following professional honors during 2020-21:

- Dr. Aasia was selected to the Executive Council of the Institute of Electrical and Electronic Engineers (IEEE) Lahore section. IEEE is the largest association of technical professionals in the world, with its corporate headquarters in New York and has more than 423,000 members in over 160 countries around the world. Its objectives are the educational and technical advancement of electrical and electronic engineering, telecommunications, computer engineering and similar disciplines.
- She has been selected as the Associate Editor of IEEE ACCESS, a peer-reviewed, open-access, Q1 scientific journal published by the IEEE, having an impact factor of 3.367 according to JCR.
- She was invited to serve as a judge in Asia Pacific Women in Artificial Intelligence (APAC WAI) Datathon titled "Combat Domestic Violence with Data and AI". It is a unique honor for FCC that ours was the only team from Pakistan participating in the event

The banner features a purple background with a white geometric globe icon on the left. Text on the left includes 'International Women's Day with WAI APAC' and a row of flags. Below that, it says 'WaiDATATHON & WaiTALK' and 'Combat Domestic Violence with Data & AI'. At the bottom left, it lists the date and time: '13th March'21 | 12PM to 6PM GMT+8 | Virbela(Virtual Event)'. On the right, there is a circular portrait of Prof. Dr. Aasia Khanum, with her name and title below it: 'Prof Dr. Aasia Khanum', 'JUDGE', 'DR/PROFESSOR', 'FC COLLEGE'.

# FACULTY SPOTLIGHT

## POST DOCTORAL ACHIEVEMENT



NAZIM ASHRAF  
ASSOCIATE PROFESSOR

Dr. Nazim Ashraf has re-joined us after completing his Postdoc. He was a Postdoctoral Research Scholar at Photonics Information Processing Systems Lab, Department of Electrical & Electronic Engineering at University College Cork, Ireland from July 2019 - October 2020. He worked under the supervision of Dr. Nabeel Riza, Chair Professor of Electrical & Electronic Engineering and Fmr Head of School of Engineering, University College Cork, Ireland on a new camera technology, the coded access optical sensor (CAOS), that works in combination with today's multi-pixel imaging sensors to pull out previously unseen image features.

## NEW FACULTY



MUHAMMAD HAROON SHAKEEL  
ASSISTANT PROFESSOR

This year we welcomed Dr. Muhammad Haroon Shakeel. He earned his PhD. from Lahore University of Management Sciences (LUMS) in June 2020. He has a specialization in data analytics for short, informal, and multilingual text through deep learning. He has also collaborated with Computer Vision and Graphics Lab at LUMS for medical imagery analytics. He is involved with Big Data Analytics Lab at LUMS on projects for efficient data analytics and has worked with Victoria University Australia on a project focusing on domestic violence detection from social media.



# FACULTY SPOTLIGHT

## PUBLICATIONS

- Maria Tamoor, Two-stage active contour model for robust left ventricle segmentation in cardiac MRI, published in "Multimedia tools and applications", 2021 (IF=2.757)
- Maria Tamoor, Automatic segmentation of medical images using a novel Harris Hawk optimization method and an active contour model, published in Journal of X-Ray Science and Technology, 2021 (IF=1.535)
- Rabrana Bqa, Samia Asloob Qureshi, Tanzeela Shakeel, Ateeqa Naseer, "Reverse Engineering on Planar Contours: An Algorithmic Review", DSIT 2021, July 23–25, 2021, Shanghai, China © 2021 Association for Computing Machinery. ACM ISBN 978-1-4503-9024-8/21/07
- Muhammad Arfan and Nosheen Sabahat, "Impacts of COVID-19 on Power Sector and The Role of ICT," 2020 IEEE 23rd International Multitopic Conference (INMIC), 2020, pp. 1-6
- Ali Goher Shabir and Nosheen Sabahat, "A Review of Hybrid Malware Detection Techniques in Android," 2020 IEEE 23rd International Multitopic Conference (INMIC), 2020, pp. 1-6
- Yusha. Shafqat. Malik, Nosheen Sabahat and Muhammad Ossama Moazzam, "Image Animations on Driving Videos with DeepFakes and Detecting DeepFakes Generated Animations," 2020 IEEE 23rd International Multitopic Conference (INMIC), 2020, pp. 1-6
- Zeeshan Mushtaq, Sagar Ashraf and Nosheen Sabahat, "Predicting MBTI Personality type with K-means Clustering and Gradient Boosting," 2020 IEEE 23rd International Multitopic Conference (INMIC), 2020, pp. 1-5.
- Sharoon Nasim, Mahnoor Rehan and Nosheen Sabahat, "Emotional Understanding of an Image by Applying High-level Concepts on Image Parts," 2020 IEEE 23rd International Multitopic Conference (INMIC), 2020, pp. 1-5
- Zainab Zahid, Ammar Haider, Nosheen Sabahat and Asim Tanwir, "Vulnerabilities in Biometric Authentication of Smartphones," 2020 IEEE 23rd International Multitopic Conference (INMIC), 2020, pp. 1-5
- Raheel Shehzad Robson and Nosheen Sabahat, "Heuristic Based Approach for Usability Evaluation of Mobile Games," 2020 International Conference on Computing, Electronics & Communications Engineering (iCCECE), 2020, pp. 156-161

# FACULTY SPOTLIGHT



**Mr. Gadhaun Aslam** led a session titled “MS Teams for Instructional Tasks” organized by Center for Learning and Teaching (CLT) for FCCU faculty members. As an alternative to Zoom, MS Teams offers one of the most common options available to us for online synchronous classes. This session focused on scheduling of MS Teams meeting from Moodle, basics of using MS Teams, like sharing of the screen, attendance reports, break out rooms, recording of lectures and sharing with students. This session was well-received by 60+ university and college faculty members.



## Using MS Teams for Instructional Tasks

# STUDENT BRANCH/CHAPTER

## IEEE STUDENT BRANCH

The following are the list of events and collaborations of IEEE Student Chapter for the year 2020-2021.



- o ICT For Development Webinar 1: The Fourth Industrial Revolution Technologies for Sustainable Development by Dr. Supavadee Aramvith(13th August, 2020).

- o An Overview of Software Quality Assurance and ISO/IEC 29110 Series of Standards and Guides for Very Small Entities by Dr. Claude Y. Laporte (19th November, 2020).

- o Collaboration with AWS Beginner Series EP #4:

Introduction to Serverless and hands-on lab on AWS Lambda by Hussain Mansoor (31st January, 2021).

- o Interactive Session for Freshies in Collaboration with ACM FCC (1st March, 2021).

- o Conversation with AWS Community Builders from Pakistan by Sumama Zaeem and Hamza Shabbir (24th March, 2021).

- o AWS Certified Challenge (1st July, 2021).

- o Build On, Pakistan in collaboration with AWS (1st May, 2021).

- o First Webinar on Professional Development via IEE from the IEEE Professional Development Series 2.0 (22nd May, 2021).

- o APES '21 RISC V vs. ARM in collaboration with IEEE UET (5th June, 2021).

- o APES '21 How Blockchain will change the world in collaboration with IEE UET (4th June, 2021).

- o APES '21 Industrial Internet of Things in collaboration with IEE UET (5th June, 2021).

- o APES '21 Data Visualization in collaboration with IEE UET (5th June, 2021).

- o APES '21 Sustainable Energy for Modern World in collaboration with IEE UET (4th June, 2021).

- o APES '21 Open Source Technology in collaboration with IEE UET (6th June, 2021).

- o APES '21 Grow Professionally in Growing Field of OSH in collaboration with IEE UET (6th June, 2021).

- o APES '21 How Tech Startups Grow and Scale Through Aws in collaboration with IEE UET (6th June, 2021).



- o Collaboration Event Tech Tehwar: How to Win Jobs on Upwork with Women in Engineering (26th June, 2021).
- o Collaboration Event Tech Tehwar: It's time for GO with Women in Engineering (27th June, 2021).
- o Collaboration Event Tech Tehwar: Towards Collaborative Machine Learning Federated Learning and Analytics with Women in Engineering (27th June, 2021).
- o Collaboration Event Tech Tehwar: Fundamentals and differences among Data Engineering Data Sciences and Data Analyst with Women in Engineering (27th June, 2021).

## ACM STUDENT CHAPTER



Association for Computing Machinery (ACM)'s Professional and Student chapters worldwide serve as pivots of activities for ACM members and the computing community in general. They provide seminars, lectures, learning forums and networking opportunities with peers and experts across the computing spectrum. The purpose of organization of technical talks, workshops, field trips and programming contests by the ACM Student Chapter is to facilitate communication and collaboration within a university's

computer science group as well as with the worldwide computing body. The following events were conducted by ACM's FCC student chapter during the 2020-2021 tenure.

### Freshman experience (Among us)

The freshmen experience was conducted on 20th October'20. Due to COVID'19 restrictions and safety measures, the entire experience was shifted to online resources. A friendly digital game named As Among Us, was organized for all. Everyone was invited through social media means and official FCCU emails, furthermore, constant reminders were sent to all the student body. The game was organized between 1 to 2pm. Two amicable sessions of the game were conducted in which a handful of students participated. The sessions lasted for 10 to 15 minutes each. In the end, the students showed their gratitude for organizing and letting them participate in such a relaxing environment.

#You have a doubt about#  
**CS Major**  
 #Ask us#





Experience is the name everyone  
 gives to their mistakes.  
 ~Oscar Wilde

Join us for an online interactive session and  
 get to know the amazing world of  
**COMPUTER SCIENCE**

**Date:** 20th October  
**Time:** 1-2 pm  
**Venue:** Google Meets



Google meet id

#Wanna play#  
**Among Us**  
 #Join us#





**Programmers**  
 We have 1 bug among us



**Date:** 20th October  
**Time:** 1-2 pm  
**Venue:** Join Discord

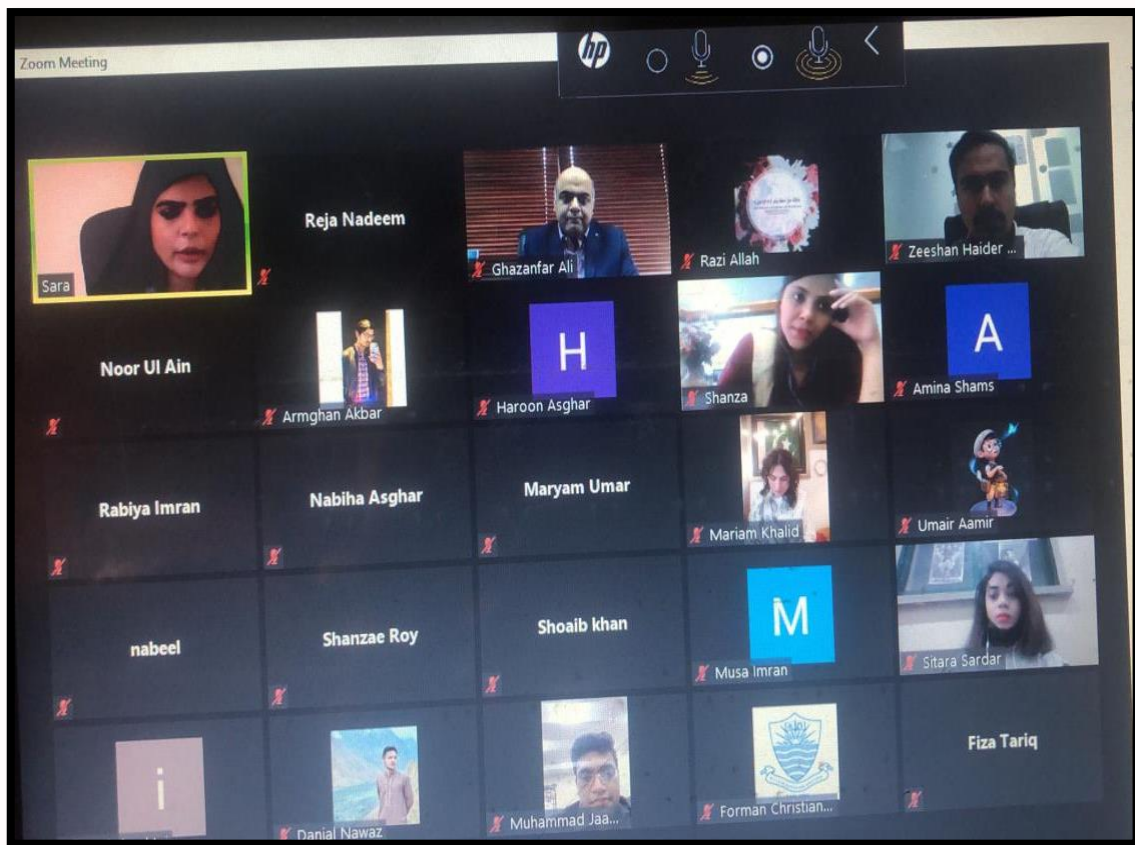


Discord Id

# CAREER COUNSELING

## SESSION: HOW TO LEAD A SUCCESSFUL CAREER

In collaboration with the Career Services Office, an online session on “How to lead a Successful Career” was conducted. Mr. Ghazanfar Ali, Country General Manager at IBM was invited as the main guest and the main spokesperson for the session. He talked about excelling in the professional life and how one can manage the best career life for itself. He eased the queries of several students in the QA part at the end of his session. The students were left with admiration, hope for a bright future, light heart and bright smiles after being guided in the right direction by the help of this session.





# VOLUNTEERING & SERVICE

A Volunteering and Service drive was initiated in Fall2020 as a test run in a couple of Computer Science Courses taught by Ms. Rabrane Bq. Students were encouraged to do the following optional bonus activity.

## [Feeding Backyard Birds] “ Feed the Birds ~ Feed the Soul ”

You are required to feed your backyard birds for “at least 21- Consecutive days”.

### WORK TO DO:

**Step 1** [Perform once]: Buy two clay pots to be placed on your rooftop/terrace/lawn: (i) Food pot (ii) Water pot. [Cost Estimate: 200-300 Rs]. You can refer pots shown below as a sample (Two Sample Pot Images were given). The left one is a sample food pot having ideally less height and broad circumference. The right one is a sample water pot; this pot can ideally have more depth to store more water and less circumference to reduce quick evaporation.

**Step 2** [Perform daily]: Fill both pots daily after cleaning them properly. Fill food pot with pearl millet (local name: Bajra). [Cost Estimate: 200-300 Rs]. It will help you attract sparrows, myna and if you are lucky pigeons as well. Fill water pot with water (warm water will be a kind act). Ofcourse you can experiment with black chickpeas, mixed pulses, rice, corn seeds etc.

**Step 3** [Perform daily]: When birds are around your pots eating & playing; take a single clear image (during day-time, from a reasonable distance) daily from this google play app: “GPS Map Camera Lite”. This android application will automatically add date & GPS co-ordinates to your image. (iphone users can find a similar app for them)

**Step 4** [Perform once] : Sync your Google Photos or Microsoft One Drive or G Cloud or Amazon Photos ...(list goes on) with your cell-phone image folder to keep auto-backup of your daily “photo-shoot”. This step is important to avoid any loss of data. (Helpful link: <https://www.makeuseof.com/tag/5-tools-to-sync-auto-upload-photos-from-android-to-cloud-storage/> )

**Step 5** [Perform once] : Submit the zipped folder of your images on moodle before the announced due date.

### Cautions:

- Locate these pots at such a place that reduces birds colliding with windows.
- Keep these pots at a location that is away from the reach of cats.
- To avoid cleaning disaster; keep your main storage (from where you are picking seeds/nuts/grains/pulses daily) away from the access of ants & other insects.

Positive response of students was overwhelming. Most of them attempted and enjoyed the activity. Few selected student attempts’ are shown next:



# COLLABORATIONS

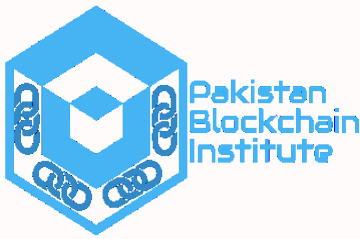
The department and its faculty are in collaboration with several outside organizations/individuals for R&D and students facilitation. Following prominent collaborations are currently active with various organizations:

## Huawei ICT Academy



DCS has collaboration with the Huawei ICT Academy KICS-UET. KICS-UET conducted a training workshop on networking tools February, 2021. The department is now a recognized Huawei Academy authorized to offer various trainings on behalf of Huawei.

## Pakistan Blockchain Institute



The Pakistan Blockchain Institute (PBI) has a significant role in providing the awareness, research & implementation of Blockchain Technology. The Pakistan Blockchain Institute and FCCU signed the MOU to provide the internship opportunities to students. Also, Both parties will conduct free / paid / commercial online and onsite training for various technologies and human resource development on mutually agreed terms.

## DICE Analytics



DICE Analytics is in collaboration with us to help in professional skill development, internship opportunities, and employability of our students.

# CONNECT WITH US...

We would love your feedback

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Check out our social media

<https://www.facebook.com/FCC.CS>

<https://twitter.com/ComputerFc>



DR. AASIA KHANUM, EDITOR INCHIEF  
MS. RABRANEA BQA, EDITOR

