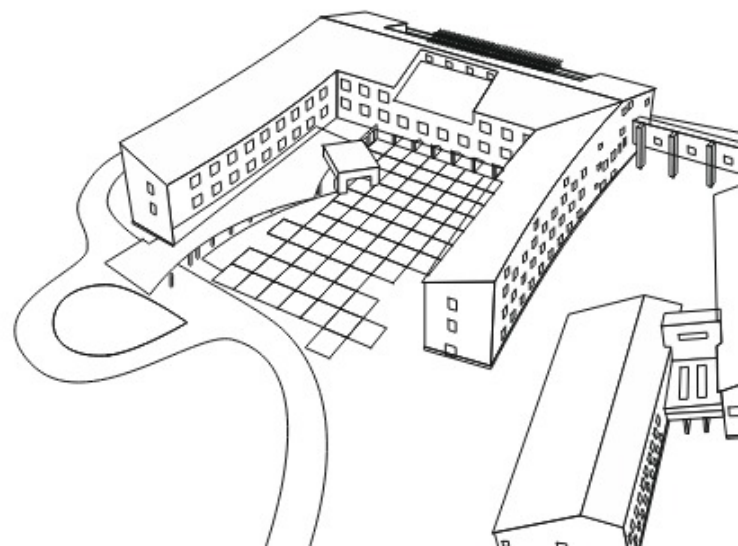# diploma brochure

UNIVERSITY OF CENTRAL ASIA
School of Arts and Sciences

Class of 2023

On behalf of the Board of Trustees and myself, I congratulate you on completing your senior projects. The "senior project" exemplifies how students apply the knowledge they have acquired during their five years at UCA to tackle real-world issues and challenges, including those related to improving the quality of life in mountain communities. Your hard work, dedication, and application of knowledge is commendable and it is inspiring to witness the diversity and quality of this year's projects which reflect your academic growth and your passion and commitment to make a difference. I extend my warmest wishes for success in your future pursuits.

Dr Shamsh Kassim-Lakha
Chairman of the Board of Trustees, UCA

Higher education is just a beginning of a life-long intellectual journey. Nowadays everybody must study constantly, non-stop, during all life. The beginning, however, is quite important: it forms initial skills, enables graduates to learn, shapes their minds, provides them with capacity to develop. The final year projects are evidence of how well this formation has been done. Quite naturally, therefore, the faculty of the school was looking forward to this final result of the five years work with great hope and with a bit of apprehension. With my great pleasure and satisfaction I say that many of our hopes finally came true and that the School of Arts and Sciences can be sure that its graduates obtained the baggage needed to start independent intellectual journey of their lives.

Dr Maxim Khomyakov
Dean, School of Arts and Sciences, UCA

Communications
and Media

Computer
Science

Global
Economics

Earth and
Environmental
Sciences

COMMS & MEDIA

Communications and Media

Aibek
NIIAZALIEV

During my time at UCA, I had a transformative student experience. The vibrant campus, engaging courses, and supportive community empowered me to grow aca- *demically, professionally, and personally, preparing me for a successful future.*

Short Fiction Film "The Price of Silence"

This diploma project is a short narrative film partly inspired by a true story and partly based on my personal life observations. The 20-minute film, "The Price of Silence", deals with one of the most concerning problems of the Kyrgyz society – the lack of awareness of women's rights. The film contains three different stories divided into three parts, which, eventually coincide in the second part and give a clear understanding in the third part like the completion of a puzzle. In the movie, you will be witnessing the scenes of harassment and bride-kidnapping. However, unlike most movies about bride-kidnapping, the main emphasis is on the experience of sympathy, com-

passion and empathy towards a father who lost a beloved one due to a fatal bride-kidnapping. Despite no apparent prospect of finding the lost person, the father still continues the search since that fatal bride-kidnapping remained unspoken in public except amongst a few people.

Aida
ONGAIBAYEVA

My time at the University of Central Asia was truly wonderful. I formed lasting friendships and discovered my passion, leaving me more assured about my life's *direction. It has been an invaluable experience that will continue to shape me for years to come.*

"Communication as Escape: Witnessing Sexual Harassment"

Sexual harassment has been a pervasive issue for a long time, but it wasn't until the last few decades that it was widely acknowledged as a problem in need of response. This research aims to explore the moment of coming out, a profound communicative event in which one seeks to "escape" from the weight of sexual harassment experiences. The act of coming out is seen as an experience that unfolds through intersubjective communication and brings the previously private experience of sexual harassment into the realm of witnessing. Adopting a phenomenological approach, the focus of the research is on the delicate nature of this communicative event and the ways in which it shapes and influences the healing process for individuals who have experienced sexual harassment. To gain insight into these experiences, the research employs qualitative data collection methods, specifically semi-structured, in-depth interviews with participants. The final output of the research is presented as a series of illustrative posters, each depicting the moment of coming out, the visceral depths of the experience for every individual participant.

Aida
YESSIMOVA

Aida YESSIMOVA

I enjoyed learning to use various equipment effectively, enhancing my presentation skills. Also, thanks to UCA I embarked on an internship in the majestic mountains of Peak Lenin. I'm grateful for the won-derful friendships formed here and the supportive faculty members at UCA.

On the Other Side of the Rainbow: the LGBT+ Stories from Kazakhstan

This project is an electronic book in PDF format, highlighting the challenges faced by LGBT+ individuals in Kazakhstan. It aims to investigate the impact of homophobia on the LGBT+ community. The book includes fictional stories based on real experiences, accompanied by relevant photographs.

Many people in Kazakhstan believe that the struggles of LGBT+ individuals are non-existent or that minority groups have more rights and opportunities. It is crucial to give a voice to these marginalized communities. For data collection, qualitative research methods were employed. Interviews were conducted with diverse representatives from the LGBT+ community, including lesbians, gays, bisexuals, transgender individuals, and other marginalized groups. These interviews served as the basis for creating fictional stories that authentically portray the struggles and experiences of LGBT+ individuals in Kazakhstan. Accompanying photographs were carefully chosen to maintain storytellers' anonymity while capturing the essence of their experiences.
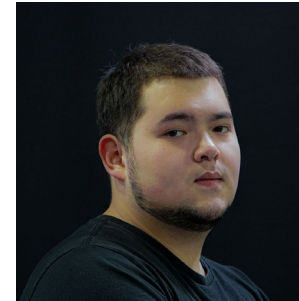
Alexey Li

My time at UCA has been nothing short of extraordinary. From engaging in innovative design projects to forming lifelong friendships, every moment has been a testament to the amazing experiences and personal growth.

Souly: The First Dating Platform Designed Exclusively for LBTQ+ Women in Central Asia

In most cultures, dating plays an important role in people's lives. For heterosexual women, it is a need they can easily fulfill by meeting people of the opposite gender in public places or creating profiles on dating platforms. For the other half, LBTQ+ people, it is a different situation. There are a lot of challenges queer women in Kazakhstan and Kyrgyzstan have to deal with on a regular basis. For years, they have been mistreated, discriminated against, and sometimes even killed. To this day, LBTQ+ women have felt unsafe to socialize and spend time with the members of their own community. Every day, they are faced with the task of stigma management to ensure their personal safety and well-being. The goal of this project is to build a safe digital space that will help LBTQ+ women overcome the challenges of queer dating, maintaining personal safety and well-being. I used a variety of UX research strategies to design an effective solution closely aligned with the needs of the research participants.

10

Alisho
QONUNOV

Studying at UCA has been an exciting journey filled with challenges and opportunities. I have been equipped with knowledge and experience that will pave the path for my future endeavours. I'll miss it dearly, the magnificent mountains above all.

Ascent into the Abyss

The project presents a short film and the key idea behind it revolves around the struggles foisted upon the Pamiri ethnic group amidst internal conflicts and bickering. At a broader scale, the film reflects on similar trials that may face any community. The goal of the project is essentially to reveal a disturbing truth to which many people often turn a blind eye and enable them to see the situation for what it is – an acquiescence of a destructive life. Throughout his journey, the film protagonist faces forces of adversity which test his will and strength to complete his quest. The ideation and narrative structure were further analysed according to the script whereby certain storytelling techniques are displayed including an inciting incident, rising tension, and finally the climax.

Anis
CHORSHAMBIEV

From the moment I began my studies at UCA, I sensed that my educational voyage was far from over. Instead of being the final destination, it became a springboard for a profound personal and intellectual evolution.

Here, I discovered that education knows no bounds, it is a lifelong companion that fuels our growth. UCA awakened a burning desire within me to achieve not only personal success but to uplift my community. Filled with determination and a vision for change, I now embark on a new chapter, armed with knowledge, passion, and an unwavering commitment to make a lasting impact."

Chid: History & Modernization

"The purpose of my documentary film is to introduce my audience to the brief history of the Pamiri house and its symbolic meanings. Most importantly the film identifies and elaborates on the architectural and symbolic changes in the Pamiri house and the factors that led to the modernization of the houses during and after the Soviet Union rule in the Pamir region. Pamiri house is one of the most significant designations and oldest repositories of the Pamiri culture over a history of more than 2500 years. Pamiri house is known by different names in different parts of Pamir. In Shugnan district, people call it "Pomere Chid" while in Rushan district the house is known as "Chud", and in Wakhan as "Khun".

Coming from the Pamiri ethnic group, this research project is of personal significance to me since it contributes to the preservation of the Pamiri house in the local context and its introduction and promotion to a wider spectrum of audience. "

Assylbek
ASSYLKHANOV

I am truly grateful for the opportunity of studying at the University of Central Asia in the past five years. I've met remarkable people during this journey who taught me wonderful lessons, and I can't help but call them my family. I firmly believe that this experience is just the beginning of a path that will take me far in changemaking for the good of the community.

The Effect of the Russian Invasion in Ukraine on Economic Migrants and Their Families in Kyrgyzstan: Case of Naryn City

This research examines the impact of the conflict between Ukraine and Russia on the economic and social well-being of the families of economic migrants from Naryn city, Kyrgyzstan. Lives of many Kyrgyz families are strongly linked with Russia as the source of income. "According to Kyrgyzstan's official statistics, more than 1 million Kyrgyz citizens reside in Russia as labor migrants" (Radio Liberty, 2022). Remittances that migrants send home directly affect the economic and social well-being of families living in Kyrgyzstan. Thus, significant events that affect the economy of Russia, also impact the income of migrants and consequently the well-being of their families. Russia's invasion of Ukraine on February 24th, 2022, followed by the economic sanctions against Russia. The consequences of the Russian invasion in Ukraine echoed globally. The question of this research is how these events happened far away from Central Asia affected families in a remote region of Kyrgyzstan, Naryn city. Qualitative methodology was used to collect data through conducting interviews with the family members of the economic migrants from Naryn city as well as economic migrants, who currently reside in Russia or already returned to Kyrgyzstan. The creative part of the exegesis includes a podcast produced based on the accounts of the families of the changes in their economic and social well-being after the Russian invasion of Ukraine.

Bibisoro
KUKANBEKOVA

My time at UCA has been a transformative journey, equipping me with lifelong friendships and personal growth. At UCA, I cultivated the skills and confidence needed to pursue my passions further and make a positive impact on the world.

The State of Media Freedom in Kyrgyzstan: An Analysis of the Current Trends

The research examines the media control mechanisms in Kyrgyzstan, explores how they have changed since 2020, and analyzes the potential effect of media control on the democratic development of the country. Taking the grounded theory approach and using semi-structured in-depth interviews with Kyrgyz media practitioners, this study identifies legislative pressure as the main media control mechanism. The legislative pressure includes acceptance of new laws, amendments to existing legislation, filing lawsuits against independent media, and initiation of criminal cases. This study also shows that authorities use narrative control to limit the coverage of certain topics, such as border conflicts, corruption, and criticism of government officials. By restricting media independence, the government seeks to control the narratives that reach the public and to eliminate unwanted criticism. Drawing on David Easton's model of political systems, this study argues that media control destroys the feedback mechanisms that connect the public and decision makers, potentially undermining the democratic development of Kyrgyzstan.

Darika
URGAZIEVA

My experience at the University of Central Asia was transformative, offering numerous opportunities. Using digitalisation for communication, I learned to drive meaningful change in the local community. Attending strong networking events further enhanced my professional growth, providing valuable connections. Hence, UCA kick-started my academic and professional journey, equipping me with essential skills to continue developing and making a lasting impact on a technology driven world.

Visual Rhetoric in Digital Marketing: The Case of Service Industry Businesses in Kyrgyzstan

With the increasing prevalence of Instagram usage in Kyrgyz society, it has become necessary to explore the use of Instagram marketing in the country's business sector. This study aims to examine the role of visual communication in Instagram marketing for effective business-to-customer communication in Kyrgyzstan, with a particular focus on the service sector in Bishkek. Using qualitative and quantitative data collected from Instagram content analysis and semi-structured interviews with 14 service businesses, this paper aims to provide an understanding of the visual communication strategies used in Instagram marketing. Applying theoretical frameworks such as color psychology, the Golden Ratio rules, Gestalt theory, and the AIDA concept this study specifically explores key visual communication factors: color adjustment, readable typography, balanced layout, consistent imagery, and persuasive appeals. Through this research, we aim to contribute to the knowledge of effective Instagram marketing practices in Kyrgyzstan's service sector, providing businesses with useful insights into how to create more compelling Instagram marketing campaigns.

Elina NAM

Documentary Film on Korean Diaspora "Koryo Saram" in Kyrgyzstan

"Kore Saram" is a short documentary film that chronicles the narrative of deported Koreans, filled with profound sorrow, loss, and challenges. During the Stalinist repressions in 1937, the Korean people were subjected to the initial wave of coerced displacement from the Far East to the uninhabited regions of Uzbekistan and Kazakhstan. The film's core concept is in the narrative of the people, recounted by the people themselves. The primary characters of the project are members of the Korean ethnic minority spanning across different age groups, encompassing the elderly, adults, and the younger generations who lived in Kyrgyzstan. Representatives of the older generation shared their parents' experiences during deportation. Meanwhile, representatives of the middle generation discussed the formation of the diaspora and diaspora life. Lastly, the representatives of the younger generation demonstrated the life and invaluable heritage their ancestors provided. As a result, the film is based on an individual's personal experiences and unique stories.

Gulborbonu
MIRZOEVA

My journey at the University of Central Asia has been an unforgettable experience, inspiring in me the passion for Communications and Media. Beyond knowledge and skills, it gifted me lifelong friendships, *invaluable contacts, and rich experience that will continue shaping my paths in life.*

The Power of Words: A Comparative Analysis of Kyrgyz and Tajik Media Coverage of the Border Dispute

After the collapse of the USSR, a series of disputes occurred between Tajikistan and Kyrgyzstan over the vague borderlines. Though the parties have tried to make agreements, they keep being violated with a new, harsher border clash. During these conflicts, the citizens of both countries depend on news agencies to get reliable and trusted information. Thus, the role of media during these conflicts is close to crucial. However, the way these events are presented and reported on has not been studied. Focusing on the most recent border conflict in September 2022, this research analyzes the reports shared by Tajik independent news agency AsiaPlus and Kyrgyz independent news agency Kloop.kg through the prism of peace journalism. Applying content and narrative analysis, the research finds common patterns and creates a core narrative that the news agencies presented to their audiences. In the end, it highlights the use of peace journalism in Kloop.kg and AsiaPlus.

Lola
BODURENOVA

My five-year experience at UCA has been an amazing journey of personal and academic growth. With supportive professors and engaging learning opportunities, I've become a confident and well-rounded individual prepared for success in the professional world.

The Impact of Outdoor Advertising on Visual Aesthetic of Bishkek Downtown

A 18-minute documentary entitled "Signage City" explores outdoor advertising in the city of Bishkek and has the main goal of exploring how advertising can influence the aesthetics of the city's landscape. The film features six key experts from various fields, including outdoor advertising, graphic design, 3D design, architecture, government urban planning, advertising urbanism. This documentary provides the audience with an exceptional and unique look at outdoor advertising in the capital of Kyrgyzstan, what effects advertising has on the visual landscape of the city, and whether advertising affects anything at all. With the help of our professionals, we delve into this topic, we compare the current situation of outdoor advertising in Bishkek with other cities, and we get the opportunity to look at outdoor advertising and murals from a completely new perspective. Ultimately, the documentary tries to answer the research question "What is the impact of outdoor advertising on the visual aesthetics of the streets of Bishkek?" and shed light on the different points of view and opinions of experts and the general public on this topic.

Milena
MELNIKOVA

My life at UCA turned out to be longer than I had planned. However, I'm glad for it. It was here that I learned to think critically, to see the problems of society and find solutions to them. It was also in the circle of people I met at UCA that I found *the confidence to become a writer and help people ask themselves about their lives in the community.*

"It ends with me" - Documentary Film About Women in Abusive Relationship in Kazakhstan

This film tells the stories of two women experienced marital abuse. One of the stories is mine. The main goal of this film is to show how tolerance for abuse in the family is passed down from generation to generation, influencing the perception of children.

Narimon
NURMAMADOV

As a student from Khorog, Tajikistan, I embarked on a transformative journey in 2017 when I joined UCA's Media & Communications department. This experience has empowered me to explore the world of media, develop my creative skills, and shape my perspective on global communication.

Decolonization of Kazakhstan

The creative piece discusses the concepts of colonization and decolonization in the context of Kazakhstan in Central Asian. The main goal of the work is to explore in-depth the associated terms and reveal the truth by answering three important questions: Was Kazakhstan in fact colonized by Russia? Does Kazakhstan need decolonization? And why is this topic raised only now, thirty years after gaining independence.

Within the process of pre-production, production and post-production, as well as throughout the interviews, efforts are made to present an objective and unbiased narrative. In the film, the views of all parties are captured. The work was inspired by the book of Ainash Mustoyapova, Decolonization of Kazakhtan. Ainash herself is the main interviewee of the video.

Nuriya
MULLO-ADBOLOVA

While reflecting on the 5 years of study at UCA, I feel a big sense of gratitude and personal growth. I have met people who challenged my beliefs and views and prompted me to reevaluate my perspec- tives, question my assumptions, and develop a more nuanced understanding of the world around me.

The State of Environmental Journalism in Tajikistan and the Role of Environmental Non-Governmental Organizations

This research presents findings of a qualitative study of environmental reporting in Tajikistan and the cooper- ation between journalists and environ- mental non-governmental organiza- tions. The research discusses factors affecting environmental reporting including pressure from the govern- ment, financial instability, lack of pro- fessional journalists, and limited access to data. These factors are discussed through political-economic, structural, and socio- cultural approaches. Several domestic journalists and representa- tives of local environmental NGO have participated in the survey, where they shared their thoughts about the cur- rent state of environmental reporting in Tajikistan.

Savribegim
NAZARSHOEVA

My time at UCA has been transformative and inspirational. The dynamic community, various possibilities, and outstanding support have enabled me to explore my passions and unlock my potential and a brighter future.

The Portrayal of Domestic Abuse Against Women in Kyrgyzstan Media: Analysis of Kaktus.Media And Kabar.Kg Media Outlets

Domestic violence against women is a major social issue in Kyrgyzstan that has recently gained more public and political attention in this country and internationally. According to the Ministry of Internal Affairs in 2021, there were 10,151 registered cases of domestic violence. Victims of family violence were issued 9,038 temporary protection orders, of which 8,463 were issued to women and 264 to minors (Dzhaparova, 2022). Given the prevalence of domestic violence against women and the underlying premise that media can affect public opinion, it is important to examine how topics like domestic abuse of women are portrayed in the media. Media portrays could have a significant impact on the public's perception of domestic violence that directly affects victims and perpetrators. This research will examine how domestic violence against women is portrayed in two Kyrgyz media outlets. The first is Kaktus.media, which is privately owned, and the second is Kabar. kg, which is owned by the Kyrgyz state.

Shakhnoza
KURBONMAMADOVA

Immersed in the stunning landscapes of Naryn, UCA became my gateway to knowledge, cultural exchange, and personal growth. It ignited my passion for learning, fostering a deep appreciation for diversity and a commitment to making a positive impact.

The Cost of Leaving (Research Theme: The Effect of Prolonged Conflicts in GBAO on Migration of Pamiri People)

My project presents a podcast that highlights the impact of forced migration on the Pamiri people of the Gorno Badakhshan Autonomous Region (GBAO) of eastern Tajikistan. GBAO is-a remote mountainous region bordering Afghanistan that has experienced several violent conflicts over the last two decades. The roots of the conflicts go back to the civil war which broke out in 1991 after the collapse of the Soviet Union. The war ended with a peace agreement in 1997 but did not put an end to frustration and economic disadvantage of the Pamiri people, who are the dominant ethnic group in GBAO. The first demonstration after the war arose between the Tajik government and GBAO in 2012 following the killing of a high-ranking Tajik security official by a former GBAO warlord. The government's heavy-handed approach led to widespread civilian casualties and destruction. Since then, the situation in GBAO has been unstable and led to more demonstrations caused by political exclusion, ethnic differences, and marginalization. One of the major consequences of these tensions has been the migration of Pamiri people to neighboring countries, Europe, and the United States. Although, Pamiri people have always migrated due to their geographical location and unemployment, the number has increased because of the political instability and unsafe environment. My diploma topic - "Effects of Prolonged Conflicts in GBAO on migration of Pamiri people" has not been researched in the context of Tajikistan. Therefore, I explored similar topics in the context of other countries, which led to making several assumptions on the negative effects on the mental health and well-being of migrants, loss of identity, difficulties with adjustment and adaptation.

Zalkar
BORONBAEV

My five years at UCA were an incredible journey filled with profound personal growth. The unwavering commitment I poured into my academic pursuits has laid the foundation for a future brimming with limitless possibilities and successes.

Kyrgyz Traditional Knuckle Bone Games and Their Role in Preserving Cultural Heritage

Traditional games are inextricably linked with the history and culture of people, reflecting their way of life and identity. A large place in the life of the Kyrgyz was occupied by folk games. The games were associated with the conditions of nomadic life, which required constant readiness for action, courage, strength and dexterity. However, it is fair to say that with new technology people are not interested in traditional games anymore because one gadget can contain hundreds of visual games. Regrettably, the new generation inherits only a drop from the ocean of games. It is important to resurrect traditional games which unite people and bring back our cultural values. To do that people need to understand the games and how they reflect the historical background of the Kyrgyz people. As soon as people realize the significant meaning of those traditional games with knuckle bones it may bring back some cultural values which had been lost.

computer
science

Computer Science

Abbosjon
MADIEV

During the development phase of this project, I found great joy in exploring a plethora of new tools and techniques. Given the project's significant scale, I embarked on a journey to grasp the fundamentals of architecting a project, allowing me to pro-gressively iterate and implement changes as required. My aspiration for this endeavor extends beyond its role as my diploma thesis; I envision its practical application within its target market, thereby contributing tangible value to the industry.

Design and Implementation of Job Searching Platform in Central Asia

The job search landscape in Central Asia is currently lacking. The region has a high proportion of young people under the age of 30, and yet they are heavily dependent on external job search platforms. Many of the national job search platforms have been sold to foreign corporations, leading to statistical measurements being conducted by foreign countries. As a result, there is a lack of reliable data on the working class of the region, which makes it challenging for governments and employers to make informed decisions regarding employment policies, job creation, and training programs. To address this issue, I have chosen to focus my final year project on developing a head-hunting platform that is specifically designed for the Central Asian region. The platform will enable users to easily post and search for job positions, and the raw data generated by the platform will provide valuable insights into the needs and skills of the local workforce. This data can be used to inform policymaking and job creation initiatives. The development of the platform will utilize the MERN stack, which is a popular web development stack that includes Express.js, React, MongoDB, and Node.js. Additionally, various APIs will be used to build both the backend and frontend of the website. The platform will also offer multilanguage functionality, providing users with the option to customize the language to their preference. In conclusion, my project aims to develop a job search platform that meets the unique needs of the Central Asian workforce. By utilizing the latest web development technologies, generating valuable data, and offering multilanguage support, the platform will address the current limitations of the job search landscape in the region. This project will offer a valuable resource for employers, job seekers, and policymakers and contribute to the region's economic growth.
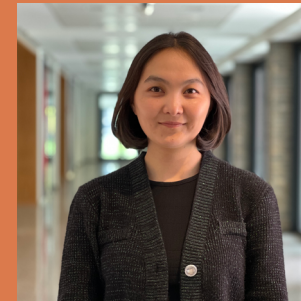
Aiza
ZHENISHBEKOVA

During my university years, I embarked on an exhilarating journey in the field of computer science. With a fervent pursuit of knowledge, I honed my skills in programming, algorithms, and problem-solving. From excelling in coursework to participating in competitions and interning in industry, I embraced diverse experiences. Engaging in research on cutting-edge technologies further fueled my passion for innovation. Equipped with this transformative journey, I am now poised to make a profound impact in the realm of computer science.

Smart Control of Environmental Parameters Inside the Beehive: A Case Study Using IOT Based Android Applications

In this study, a prototype of a smart control system for temperature management and sound detection inside a beehive was developed. The ESP8266 ESP-12E development board, two portable waterproof heaters of 8 W each, and a DS18B20 temperature sensor implement a 2-step control algorithm. For the sound sensor, the LM393 microphone and board ESP8266 ESP-12E were used. The results of the temperature experiment conducted at the campus of the University of Central Asia (city of Naryn, Kyrgyzstan) showed the operability of the developed prototype at negative outdoor temperatures.

The results of the temperature sensor showed efficient functionality. To further improve the system's usability and user experience, an Android mobile application was included. Overall, by creating a regulated environment inside the hive, the designed method shows the potential in enhancing the production and well-being of bees.

Alexandra YUGAY

Discovering a completely new field of knowledge is always difficult. However, it is worth the challenge because in return you broaden your horizons and get to know your current limits. Sometimes starting a project from the bottom up and failing can be a good reminder that you are capable of making mistakes and failure is just another stepping stone to future success.

Development and Implementation of a Windows Desktop Application for Real-Time Gaze Tracking on a Laptop Screen as an Additional Method of Proctoring Online Tests and Examinations

With the growing popularity of online education, we have to modernize old ways of proctoring and adjust them to work with the limited information available during online assessments. A web camera is one of the most frequently used mediums of online proctoring. One of the ways we can extract useful information from web camera footage is gaze tracking – the process of identifying the direction of a person's gaze and mapping it on the screen. It can be used to identify if the subject is looking at the screen during the online examination or in some other direction which may indicate the possibility of cheating. The eye-gaze tracking field offers many different approaches that I will introduce to you later in the paper. I will walk you through the process of trying to implement a gaze-tracking model and the screen-recording application for Windows using tools and libraries available for the Python programming language. The purpose of this work is to present trials and errors encountered during the development process and to create a valuable resource for future contributors and researchers in the vast field of eye-gaze tracking.

Arfan
SHAH

An Efficient Machine Learning and Image Processing Based Methodology for Tomato Leaf Disease Detection and Classification

The world is facing food crises and the situation in developing countries is getting worst day by day. People do not get enough food, which raises questions about their health. Fruits and vegetables are a major source of food in various regions, especially in developing countries. Diseases in fruits and vegetables result in reduction of food. To increase the production of fruits and vegetables, farmers should be able to identify the disease in time to avoid further damage. This research aims to identify and detect diseases in tomato leaves using Image Processing and Machine Learning techniques. There are six stages from the beginning to the end of this research. The stages include image acquisition, pre-processing, image segmentation, feature extraction, classification, and disease identification. Image acquisition includes taking a large dataset which contains 40, 000 images. Image cropping, image resizing, and image enhancement are used to pre-process the images. For image segmentation various segmentation algorithms are used, such as Edge Based Segmentation and Region-Based Segmentation. Gray Level Co-occurrence Matrix (GLCM) is utilized for feature extraction. Support Vector Machine (SVM), K-Nearest Neighbor (KNN), Random Forest, Decision Tree, Logistic Regression, Artificial Neural Network (ANN), Convolutional Neural Network (CNN), and Naïve Bayes have been used for classification. Two types of classifications are being performed: binary and multi-class classification. Diseases in multiclass classification include healthy leaf, early blight, late blight, bacterial spot, leaf mold, mosaic virus, spider mites, target spot, yellow leaf, and Septoria leaf spot. KNN gives the best result of 96.19 % accuracy followed by Decision Tree with an accuracy of 93.12 %.

Arystan
ALTYNBAYEV

Development of Android Mobile Application for GPS Tracking of Buses in Bishkek City

Innovative solutions to improve the commuting experience have been developed as a result of the accelerated rise of urban populations and the rising demand for effective public transit. In order to give consumers access to real-time bus location information and increase overall public transportation efficiency, this study describes the design and deployment of a GPS-based bus monitoring system for the city of Bishkek. Two distinct Android mobile applications—one for bus drivers and one for users—make up the system. They were created using the Java programming language and Android Studio. The driver's application uses the device's GPS to gather real-time location information, which it then sends to the Firebase Realtime Database. Using the Google Maps API, the user's application shows the location of the closest bus on a map and lets users search for buses by their number or ID. The created system underwent testing for usability, dependability, and user experience, indicating its potential to greatly improve Bishkek city's public transit system. Future research may examine deeper integration with the city's transportation network and extra features like route optimization and traffic-aware navigation.

Bashir
ALAM

Throughout my final project, I have gained valuable knowledge that have shaped my understanding of environmental issues and the power of data-driven solutions. This project has not only deepened my understanding of air pollution and its implications but has also provided me with practical skills in data collection, preprocessing, and machine learning modeling.

One of the most significant lessons I learned from this project is the critical importance of addressing air pollution, particularly in cities like Bishkek. The alarming levels of pollution and this realization has instilled in me a sense of urgency and a commitment to contribute towards finding effective solutions.

An Effective Approach to Assess and Predict the Air Quality in Bishkek Using Various Machine Learning Techniques

Air pollution is the presence of any air pollutant that can affect the health, environment, plants and other animals (Oxford reference, n.d.). Air pollution plays a crucial role in global warming, serious health issues and habitat losses. Although air pollution and climate changes have negative impact on every part of the world, Bishkek is in the top 5 most polluted cities of the world during the cold season. According to IQAir, on 15 January 2021, Bishkek was at the top of the most polluted cities. In recent years, the air quality has become even worse, making people worried about the negative impacts it could have on health and the environment (Isaev, 2022) . Despite being among the topmost polluted cities, there has been very little research and efforts to control the air pollution. However, in recent years, the Institute for Environmental Solutions Public Foundation has installed sensors in various parts of Bishkek to keep track of the air pollutants. At the same time, the U.S. Embassy in Kyrgyzstan had installed sensors to show the air quality online live which is updating every hour. But still, these efforts are not enough. Our proposed work will analyze and forecast the quality of air in Bishkek by understanding various pollutants - PM1, PM2.5 and PM10. The proposed work consists of three different types of stages which include data collection and preprocessing, training models and user interface. In the data collection and preprocessing, we collected data from various open resources and preprocessed to make it suitable for Machine Learning models. Some of the data preprocessing methods that were mainly used in this work are filtering, grouping, handling null values and merging different data frames together. The second part is the training process. This work has used regression models, classification models and time series forecasting models. The regression models predict the quantity of pollutants mainly PM1, PM2.5 and PM10, while the classification models are used to predict the quality of air. This work also forecasts the quality of air and AQI of Bishkek using ARIMA time series model as well. In conclusion, this research analyzed and found the trends in air pollution throughout the year and predicted air quality using various Machine Learning techniques.

Begaiym
BEKSULTANOVA

Studying at the University of Central Asia taught me to expect the unexpected and come prepared no matter what. Besides, *I acquired knowledge that is not achieved through hard practice but by learning the theory.*

Price Calculator Web Application Using Deep Learning for Food Recognition

The project focuses on food automation, which has been a hot topic for the last decades. Such tools as artificial intelligence, machine learning, and robotics have made it possible to create new ways to prepare food, take food, and even make payments. So, it is time to enhance the catering business further. This project is about applying deep-learning techniques to contribute to creating self-service cashier desks in canteens like on UCA campus.

Using state-of-the-art machine learning algorithms, I develop the pipeline capable of identifying the food on the tray, as well as the web application that employs the pipeline to make a full demo of the future self-service cashier application.

Diana
TENIRBERGENOVA

Workforce optimization has been a challenge for many organizations nowadays and has a huge influence of improving the efficiency and productivity of the workforce. Creating an optimization tool using the newest techniques and mathematical equations was beneficial in gaining new knowledge and experience. The work done for this project will be advantageous for my future job opportunities.

Development of the Multi-objective Resource Capacity Planning Optimizer

The project report is aimed to use Erlang formulas and programming technologies such as Python programming language and machine learning techniques in order to develop a Multi-objective Resource Capacity Planning Optimizer for contact centers. Erlang formulas play a crucial role in creating optimization tools as it makes the basis for the punctual forecast, which predicts the number of agents that are required to handle the specific number of calls during one hour, and punctual reverse forecast, which calculates the maximum number of calls that available agents can handle in one hour. The punctual forecast becomes the ground for the creation of the multiobjective optimization calculator, which predicts the number of agents required to handle the specific workload taking into consideration the historical data file enclosing the information about past calls in multiple languages, periods, and channels. For more comfortable utilization, the workforce management tool is developed into a web application with a user-friendly interface, where the users are able to do the forecast manipulations on their own. The web applic tion allows the users to run punctual and punctual reverse forecasts using the direct entry of inputs and import the input Excel file filling the offered template. In a similar manner, all three optimization types offer the possibility to see the result on the screen and import it into the Excel file. The web-based optimization tool addresses the gap of most other workforce management tools in terms of optimizing the workforce for multiple periods, languages, and channels and solves the problem of simplicity in using the tool. Correspondingly, Erlang formulas happen to be a powerful tool for workforce optimization. Developed Multi-objective Resource Capacity Planning Optimizer for contact centers is achieved by working with Erlang formulas together with the applicability of the newest technologies.

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Dilovar
MASHRABOV

I always wanted to help people in Tajikistan by implementing my computer science knowledge. This project on comparing loans offered by different banks in Tajikistan caught my attention as it addresses a common pain point for people. The use of web scraping techniques to extract data from bank websites and generate reports based on bank performance is a creative approach to providing customers with valuable information. I appreciate the use of Python libraries such as Beautiful Soup,

Pandas, and Selenium to implement the project, which shows attention to detail and a commitment to using the latest technology. The project's scalability is also impressive, as it allows for future enhancements to be easily integrated. Overall, this project demonstrates a strong tool for customers to compare loans and make informed decisions when choosing a bank to ger their loans in Tajikistan.

Telegram Bot for Finding Best Loan Conditions in Tajikistan Banks

This project aims to provide a solution for customers in Tajikistan who want to compare loans offered by different banks. The system uses web scraping techniques to extract data from bank websites and stores the data in a database. The collected data includes interest rates, maximum loan amounts, and loan durations for both consumer and car loans in TJS and USD. The system also generates reports based on the performance of each bank, which are calculated using indicators such as assets, liabilities, return on assets, and liquidity ratios. The reports provide customers with additional information to help them make informed decisions when choosing a bank. The project is implemented in Python, using libraries such as Beautiful Soup, Pandas, and Selenium. The data is stored in an Excel file, and the system is designed to be easily scalable for future enhancements. Overall, this project provides a valuable tool for customers to compare loans and make informed decisions when choosing a bank in Tajikistan.

Emir
ABASKANOV

As a senior at the University of Central Asia in Naryn, I've spent five enriching years majoring in Computer Science. My journey, amidst breathtaking mountains, has allowed me to appreciate the union of nature and technology. For my capstone project, I've developed a driver drowsiness detection system using machine learning algorithms. This endeavor reinforces my belief in technology's power to contribute to societal well-being. Completing my final year, I am eager to further apply my education in AI and Computer Science to create a positive societal impact.

Automatic Drivers' Drowsiness Detection System Using Machine Learning Algorithms

It is crucial to identify drivers who are drowsy so that accidents might be avoided. In this paper, a strategy based on machine learning and facial landmarks is proposed for the real-time detection of driver drowsiness in order to detect whether or not a motorist is sleepy. The technology uses a webcam to capture a driver's face in real-time and analyze their eye and mouth movements. To train and evaluate the machine learning model, we used a self-made dataset consisting of 4192 pictures with incorporation of a dataset from an open source Kaggle consisting of 4000 pictures. The suggested method attained an F1 score of 95% and accuracy 95%, precision 94%, and recall of 96%.

The system is implemented on a Raspberry Pi 4 Model B computer using Python programming and the development environment Visual Studio Code. OpenCV for image processing, dlib for detecting face landmarks, and scikit-learn for machine learning were just a few of the libraries utilized. For version control during the development process GitHub was also used.

The results obtained show that the suggested method accurately determines driver drowsiness in real life. The device may be linked to current driver assistance systems and potentially lessen the risk of sleepy-driving-related traffic incidents. The suggested system can be enhanced in the future by including more features to increase the detection's accuracy, such as head position and blinking frequency. To offer a complete driver-aid system, the system may also be expanded to identify additional driving habits, such as texting and driving while drunk.

Erlan
BAZAROV

My final year project was fun and beneficial to work with. Game development and machine learning are already compelling fields for young people. Hence, mixing them makes it even more amusing. Also, it is a field that is growing fast and has great potential. By developing my project, I enhanced my knowledge of game development, OOP concepts, geometry, and re-inforcement learning. Moreover, I learned the ML agents library from scratch along with conference paper writing skills. All the above-mentioned skills and knowledge will be helpful for my future career regardless of whether it will be an ML specialist, software engineer, game developer, or academic researcher.

Top-Down Single-Player Shooter Game That Uses Reinforcement Learning (RL) to Train Playable and Non-Playable Characters (NPC)

The field of Reinforcement Learning (RL) is rapidly growing, with successful experiments being conducted in the gaming industry. Despite the emergence of tools and techniques for RL in games, practical usage of RL to affect the behavior of characters in single-player action video games is still lacking. This study has been conducted to explore the gap by implementing an action game that uses RL to train characters' behavior. The research focuses on making the characters a part of a playable game, using RL to affect their actions in a shooter game with a top-down view. The game is made using Unity engine, and RL is applied with the help of ML-agents, a toolkit that can be used with Unity. Specifically, the game has two characters: one with a gun and flashlight, and another that has no weapons but can perform a dash forward and deal damage. This project examined if characters will be able to take cover from danger, search for targets in a dark place using the flashlight, evade attacks, eliminate enemies with a handgun, perform launch/dash attacks efficiently, eliminate targets when they both pose a threat and do not, flee or avoid an enemy, and navigate obstacles.

Hamroz GAVHAROV

A Smart Gate Entrance Attendance System Based on Real-Time Face Recognition for the University of Central Asia

This report presents the development and implementation of a face recognition-based attendance system, designed to improve the efficiency and accuracy of tracking student attendance at educational institutions. The proposed system utilizes a Convolutional Neural Network (CNN) to recognize faces and determine student presence, eliminating the need for manual attendance tracking and reducing the potential for human error. The face recognition algorithm consists of four main steps: detecting faces in an image using the Histogram of Oriented Gradients (HOG) method, normalizing face images by centering the eyes and mouth, encoding faces with a CNN to generate compact representations, and identifying individuals by comparing the test image encodings with known individuals. The chosen CNN model demonstrates superior performance compared to other traditional face recognition algorithms, achieving high accuracy rates in a variety of test conditions. The attendance system is integrated into a Django-based web platform, which offers a userfriendly interface for various stakeholders, including administrators, security personnel, and developers. The platform provides features such as taking attendance with live camera feed or uploaded images, monitoring attendance records, and managing user information. Additionally, the system allows exporting attendance data and supports emergency procedures for efficient communication and response. Using facial recognition technology to track attendance in educational settings can greatly simplify processes, promote accountability, and save time and resources. With continued development and improvement, this technology has the potential to become even more efficient and adaptable, expanding its usefulness in a variety of settings.

Hamza
NOYOBSHOEV

As an individual deeply passionate about the intersection of music, culture, and technology, I have dedicated myself to the creation of an innovative tuner application specifically designed for central Asian string instruments. I bring my extensive knowledge in Java and Android Studio to this project, ensuring a well constructed and efficient application.

Tuner for Kyrgyz Komuz, Afghani, Rubab, and Pamiri Rubab on Android Studio and Java

This project aims to develop a tuner application for central Asian string instruments on Android Studio using Java. The application is based on the YIN pitch detection algorithm, which has proven to be the most accurate and robust algorithm in our experiments. The tuner application is designed to provide accurate and reliable tuning for a variety of central Asian string instruments, including the komuz, dutar, and tanbur. The tuner application includes features such as soundwave visualization, string selection, and a safeguard to prevent breaking strings. Further improvements to the application's functionality and user experience are proposed, such as incorporating machine learning techniques to enhance the pitch detection algorithm and adding customizable tuning presets and instructional guides. Overall, the developed tuner application provides an accurate and efficient tool for musicians and music enthusiasts to tune their central Asian string instruments.

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Kanykei
MAIRAMBEKOVA

An Efficient Methodology for Breast Cancer Classification Using Principal Component Analysis and Machine Learning Algorithms

Today, breast cancer is the second most severe and frequent cancer type, affecting women. Its earliest prediction helps to identify the treatment earlier and eliminate the risks as much as possible. Because of that, different machine learning techniques have been implemented for breast cancer prediction. However, studies still need to be done to get the highest accuracy with novel and efficient machine learning methodology. This study examines breast CT scans in RGB scale and aims to apply several supervised classification algorithms to extracted statistical features such as mean, variance, skewness, kurtosis, contrast, correlation, entropy, homogeneity, and energy for each color channel. Moreover, the paper proposes and examines three approaches in image processing and feature extraction: the application of Principal Component Analysis and Histogram Equalization before statistical features extraction, the application only of Histogram Equalization, and direct feature extraction without implementing the preprocessing techniques. The results show that all three methods show promising results by demonstrating 96% accuracy. Nevertheless, the third method performs better in terms of computational complexity. Finally, the results of the study are presented in the web application allowing users to get classification for their uploaded breast CT scans.

Khushnud BOQIEV

Design and Implementation of Full Stack (Web + Android) Based Inventory Management System Using QR Codes for the University of Central Asia, Naryn Campus

This document details the creation and assessment of a centralized Inventory Management System (IMS) for UCA, a large business with three campuses spread across three countries and a variety of additional infrastructures. The present paper-based IMS has trouble effectively handling the increasing volume of objects moving around the company. The project's goal is to create and deploy a cutting-edge, technologically advanced solution to modernize warehouse management, boost the effectiveness of financial and human resources, and improve user experience. To determine the weaknesses of the current inventory management system, extensive investigation was conducted. The proposed system offers real-time data access, analytics, and reporting using a web application, a mobile application, and a Django-based backend. A userfriendly dashboard, item search using QR codes, multilingual support, and automated expiration date notifications are some of the key features. The new IMS effectively tackles the difficulties UCA experienced by providing a centralized and effective war house management solution for usage across all of its campuses and infrastructures. The system has the potential to dramatically enhance UCA's asset management and overall operational efficiency, as seen by its simplicity of use, extensive capabilities, and capacity to adapt to the organization's changing demands.

Meerbek
AKIMZHANOV

Development of a Comprehensive Ride-Hailing App Using React Native for Naryn Community

The current study explores how to use the React Native framework to build, innovate, and use a comprehensive ride-hailing platform for the Naryn population. The main goal of this effort is to create a reliable and user-friendly platform for the Naryn community, which currently lacks a reliable transportation system. Three main parts make up the ride-hailing app: a user app, a driver app, and an admin panel. Passengers can use the user app to request rides, track the location of the driver who will pick them up, and edit their own profiles. Drivers can accept ride requests, find the passenger's starting and ending points, and edit their accounts using the driver app. The Laravel-created admin panel provides a user interface for managing driver profiles, checking driver locations, managing user requests, and evaluating various performance metrics. Real-time location tracking and data upkeep are done using Firebase Firestore. The literature on React Native, Firebase Firestore, Laravel, and existing ride-hailing app services is thoroughly analyzed in this report, which is followed by an in-depth analysis of the system's requirements analysis, design, implementation, and testing. The findings suggest that the developed ride-hailing application can meet the needs of the Naryn community by providing a practical and dependable transportation option. The project also outlines the potential for future work and advancements, such as expanding the app's features, enhancing the user experience, and scaling the system to accommodate an expanding user base. React Native, Firebase Firestore, Laravel, Naryn, user app, driver app, admin panel, real-time location tracking, data management, requirements analysis, design, implementation, testing, transportation solution, user experience, scaling, upcoming work, performance metrics.

MIRZONABOTOV

Design and Implementation of Mobile Application for Hostel/Homestay Booking in Tajikistan Using Hypertext Transfer Protocol Secure (HTTPS) and Short Message Peer to Peer (SMPP) Protocols

Even though hospitality industry is one of the most lucrative sources of income in the rural areas of Tajikistan, there is still lack of infrastructure in it. Specifically, homestay booking is still very challenging due to instability and inconsistency of the Internet in the rural areas. Thus, the main purpose of this project is to create a booking mobile application that works using SNPP protocol in case of the absence of the Internet and presence of 2G or 3G. The application will have functionality for searching, booking, cancelling a booking and changing check-in/check-out dates. It will also support these operations over SMPP protocol. The app will mainly take advantage of

SMSing to provide a communication platform for the homestay providers and customers in the absence of the Internet. This solution is designed for the rural areas of Tajikistan where internet connection is very unstable or does not exist at all.

Naita
ABDRAKHMANOVA

Android Mobile App: Alert and Protect People from Kidnapping

The development of an Android mobile application designed to solve the problem of kidnapping and provide citizens of Kyrgyzstan with a tool to quickly notify emergency services and government agencies of their location was presented. The application, developed using the Java programming language in the Android Studio IDE, includes features such as login and registration, password reset, SOS button activation, location tracking, as well as language and theme options. The goal of the project is to contribute to a safer society for all people by reducing the risks of kidnapping and human trafficking. The app's features help users send an SOS message with their location to emergency contacts and government agencies. The app also includes a map and emergency videos that provide users with important information and advice in case of an emergency. Overall, the Android mobile app aims to prevent and protect people from being kidnapped and contribute to a safer environment for Kyrgyz citizens.

Nina PETRUSHKOVA

Working on a project to improve the UCA 3D printing lab operation was an interesting experience. This unique project allowed me to develop new skills and contribute through technology to the community I am a part of. I am enthusiastic about continuing to contribute to meaningful projects and using my abilities to create positive change.

Development of Web Service for Processing Orders for 3D Printing Lab with a Cost Calculator

3D printing is one method for transforming digital 3D models into physical 3D objects of any shape and form. It is applied in a variety of industries: aerospace, automotive industry, food industry, healthcare, architecture and construction, fabric and fashion. One of its unique features is the possibility of production of goods and equipment locally, which reduces the need for expensive and time-consuming transportation. This local production is especially valuable for remote areas with limited transportation and resources, allowing them to have an industry and making accessing needs easier. In addition, 3D printing technology advantages, such as on-demand manufacturing, customization, and prototyping, make goods and products fit the specific needs of remote communities with lower costs and faster delivery time. Given the points listed above, this project aims to give a remote region of Kyrgyzstan - Naryn the opportunity to have an industry and produce goods and equipment locally through 3D printers from the UCA 3D Printing laboratory. The current work management system of the 3D printing laboratory was started recently. However, it is not yet completely developed, making it challenging to handle the increasing number of orders and provide information about each. Additionally, the system is only designed for admin use. The project goal is to develop a web service that can optimize the processing of orders for a 3D printing lab, making it more transparent and easier to track, with distinct panels for customers and admin. The system has an integrated cost calculator that considers material, production, and labor costs when giving the estimated final price for an order. The calculator also provides time estimation for order completion, making placing orders more effective. In addition, the system includes such features as order tracking, multilingual support, and report generation. The development involved several stages: designing a user-friendly interface, improving user experience, and integrating databases and API. Overall, the proposed project optimizes and enhances processing orders for the 3D printing lab, saving time and costs for the UCA 3D laboratory and making placing and tracking orders available for its potential customers.
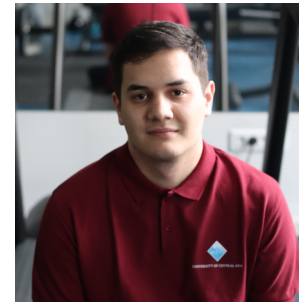
Romiz
ABDULLAEV

During my enriching five-year journey at the University of Central Asia (UCA), I had the privilege of immersing myself in a vibrant academic environment and experiencing the exceptional quality of education and mentorship provided by the esteemed faculty. UCA has played a pivotal role in shaping my educational and personal growth, and it has been a significant part of my journey in developing the UCA Mini-Market smartphone application.

Design and Implementation of the Java Android Application "UCA Minimarket" Using Firebase Realtime Database

A smartphone application called UCA Mini-Market was created to improve the community of the University of Central Asia's purchasing experience. With the help of the application, students will have a platform to buy and sell goods on the university campus, improving accessibility and convenience for all users. Figma, Draw.io, Android Studio, and Firebase Realtime Database were used to construct the app. The project was carried out using the four-phase Rapid Application Development (RAD) methodology: design, prototype, testing, and implementation. Users of the program can register, browse through list of products and contacting the seller in order to discuss about payment. All of the user and product data is managed and stored in the Firebase Realtime Database, which makes it simple for the application to fetch and update data in real-time. Figma was used to create the user interface, guaranteeing an aesthetically pleasing and user-friendly layout. The UCA Mini-Market project is an illustration of how technology may be used to enhance the quality of life for people in a community. The software has the ability to cut down on the time and effort needed for shopping while simultaneously giving users a platform to make money by selling goods. The project shows how the RAD methodology can be successfully applied while creating a mobile application, ensuring that the finished product is both aesthetically pleasing and user-friendly in addition to meeting the needs of the end users.

Rysgul NURBEKOVA

During my enriching five-year journey at the University of Central Asia, I acquired comprehensive knowledge in computer science, honed my leadership skills, and cultivated a spirit of volunteering. The university's well-rounded curriculum and supportive professors not only fortified my technical acumen but also nurtured an innovative mindset. The emphasis on community service ignited my passion for giving back, providing opportunities to develop essential leadership qualities. This multifaceted learning experience has prepared me to tackle future challenges with resilience and adaptability, laying a strong foundation for my impending success.

A Waste Detection Robotic Arm That Classifies Garbage into Paper, Plastic and Cardboard Using Deep Learning

This paper presents an innovative waste detection robotic arm designed to classify and sort garbage into paper, plastic, and cardboard categories using advanced deep learning and object detection techniques. The proposed system consists of a deep learning-based garbage classification model, a smart conveyor belt for automated waste transportation, and a robotic arm controlled by the classification model to handle the waste. Utilizing Agile methodology during the implementation, this study discusses the project's development process, key challenges, results, and future prospects in detail. The findings demonstrate that the automatic waste sorting system effectively reduces human contact with potentially hazardous waste materials, thereby enhancing safety and efficiency. By contributing to a significant reduction in landfill waste, this project has substantial environmental benefits, addressing critical waste management issues and promoting sustainable practices.

Shahnoza
DODIKHUDOEVA

During my time at the University of Central Asia, I gained valuable knowledge and hands-on experience that have shaped my academic journey. Additionally, the combination of classroom learning *and practical experience has equipped me with a strong foundation and a real-world understanding of the field.*

Development of the Chatbot in Tajik Language using Natural Language Processing models and Machine Learning Methods in the Example of Tcell Telco

Research on Natural Language Processing (NLP) in the Tajik language is an emerging area that requires attention. While the majority of NLP techniques have been developed and trained on widely spoken languages like English and Spanish, there has been relatively limited research on low-resource languages such as Tajik. Consequently, the existing models may exhibit poor performance when applied to Tajik text. To address this issue, it is crucial to focus on experimenting with various models and preprocessing techniques specifically tailored for Tajik data. By conducting thorough investigations, we can identify the most effective approaches for working with Tajik language data and optimizing NLP tasks in this context.

Shakhansho (Shukur) SABZALIEV

Spatio-Temporal Analysis of Volleyball Data for Complete Tracking

With the increasing application of artificial intelligence in various fields, computer vision techniques have significantly impacted the realm of sports. For example, the Hawkeye system in tennis has changed how people watch and play the game. In this research, we want to use the latest computer tools to improve volleyball. I am going to create a very first annotated volleyball videos and share it with other people who want to learn. In addition, I will also create a website where users can upload their own volleyball videos and choose what parts they want to see, like the ball or the players. Using Keras and PyTorch software will help me to make this happen. My hope is that this project will help volleyball become popular among open-source developers and computer vision practitioners, or at the very least, the dataset I created will be of use to fellow developers.

Shanbe QADAMSHOEV

Intelligent Evaluation Tool for Academic Course Assessments

The rapid growth of online learning and the increasing availability of educational data due to network expansions have led to the development of advanced technologies for assessing and providing feedback to learners. This paper presents an overview of the current state of automated essay grading and learning analytics, discussing their potential benefits and challenges. I review machine learning techniques for scoring. Moreover, I investigate the application of agile software development methodologies to the design and implementation of online learning platforms. In conclusion, I emphasize the significance of user engagement and motivation in the design of effective online learning environments.

By synthesizing findings from diverse research areas, the aim is to provide a comprehensive understanding of the current landscape and future directions for technology-enhanced learning and assessment.

ICON

Global Economics

Anusha
ASHUROVA

During my transformative five years at the University of Central Asia, I nurtured a passion for knowledge, fostered my intellectual curiosity, forged lifelong friendships, met exceptional professors, and embraced challenges and diversity. UCA empowered me to become a visionary leader ready to tackle global challenges and contribute to positive change in my community.

The Importance of Promoting the Employment of People with Disabilities in Economic and Social Development: A Cross-Country Analysis

Many scholars hold the view that labor force participation of people with disabilities has been a persistent challenge encountered by disabled individuals on a global scale. Despite facing health and social discrimination, people with disabilities continue to encounter discriminatory practices in the job market, which can also impose some economic costs. This paper aims to explore the role of employment of people with disabilities in economic growth through cross-country analysis by using qualitative and quantitative methods. Implementation measures are discussed throughout the paper with important policy implications to tackle the issue in the long run. Using ordinary least square regression, it is estimated that the employment ratio of people with disabilities has a statistically insignificant but positive impact on economic growth. The suggested policies offer employers and governments a guide for creating inclusive practices that address the special requirements of persons with disabilities, promoting a more equal and successful society.

Anusher KHUMORIKOV

While I don't have the feeling of becoming a UCA graduate yet, I am excited for the opportunities that lie ahead. Gratitude fills me for the invaluable experiences and abundant growth I have encountered at UCA, both academically and socially. I aspire to apply the wealth of knowledge, skills, and experiences acquired during my time at UCA, be it in further academic pursuits or within a professional environment, to contribute in fostering positive changes.

Potato Value Chain Analysis in Roshtqala, Shugnan and Ishkashim Districts of GBAO, Tajikistan

The Gorno-Badakhshan Autonomous Oblast (GBAO), where potato cultivation is prevalent, needs to improve its value chain and agricultural practices to alleviate poverty, drive economic growth, and ensure nutritional security despite Tajikistan's mountainous terrain and limited land resources. The study examined the potato value chain, market dynamics, and pricing in Roshtqala, Shugnan, Ishkashim, and Khorog to improve productivity, profitability, and sustainability. Potato production, cultivation, varieties, input supply, and illnesses were examined using secondary data from numerous sources and qualitative methods like interviews, site visits, and stakeholder group talks. The survey identified a few commercial potato producers and many small-scale farmers, underlining the need to improve the value chain to add value and boost economic growth in rural areas like GBAO.

To improve the potato value chain and outcomes, farmers in the research region need inexpensive high-quality inputs, pathogen-free seeds, modernization, technology adoption, labor solutions, strategic coordination, and training.

Anushervon
NAZARALIEV

Graduating from university is an incredible achievement that symbolizes years of hard work, dedication, and personal growth. It fills me with immense pride and a sense of accomplishment to have successfully completed my academic journey. This milestone not only marks the end of a chapter but also opens the door to new opportunities and challenges, where I can apply the knowledge and skills gained during my university years. I am excited to embark on the next phase of my life with confidence and enthusiasm.

The Economic Significance of Hunting Tourism in South-Eastern Tajikistan

This research paper explores the economic significance of hunting tourism in South-Eastern Tajikistan. The study adopts a qualitative research design method to gain an in-depth understanding of the impact of hunting tourism on the local economy and effective policymaking for environmental protection. The hypothesis posits that hunting tourism has a positive impact on the local economy by generating revenue for local communities, supporting businesses, and creating employment opportunities. The research findings reveal that hunting tourism has contributed significantly to the region's economy. The study concludes that sustainable conservation practices and the development of local economies are crucial for the continued success of hunting tourism in South-Eastern Tajikistan.

Bezhan
BAHROMOV

The Impact of the "Law of The Republic of Tajikistan About State Registration of Legal Entities and Individual Entrepreneurs" on Business in Tajikistan

This study investigates how the Republic of Tajikistan's 2009 Law on State Registration of Legal Entities and Individual Entrepreneurs has affected the country's startup rate. Despite high tax rates and challenges in recruiting a qualified workforce, the law's implementation has created a more advantageous climate for the development of enterprises in Tajikistan. Additionally, the study highlights the importance of the GDP growth rate and received remittances as macroeconomic drivers that shape the business climate. The findings of this thesis shed light on the dynamics of new business development in Tajikistan, as well as the potential implications of focused regulation.

Gulabru ABDURAKHMONOVA

From surviving countless late-night study sessions to becoming a procrastination pro, my university journey has been a wild ride. As I prepare to graduate, I can't help but look back on the friendships I've made, the lessons I've learned, and the personal growth I've experienced. With my degree in hand and a newfound understanding of time management, I'm excited for the next chapter, filled with new adventures and hopefully a healthier relationship with sleep.

Lived Experiences of Females Entrepreneurs: A Study Based on Small Businesses in Khorog, Tajikistan

This study focuses on the obstacles, family support, social expectations, and financial restraints faced by female entrepreneurs in Khorog, Tajikistan. The study used a qualitative methodology and included in-depth interviews with female entrepreneurs. Numerous important results are found from this data gathered. First, Khorog has a very equal financial environment as none of the interviewees faced obstacles when trying to acquire financing. Second, there is no evidence that social pressure or gender discrimination prevent women from pursuing their own businesses. However, the study found that dual responsibility is a significant obstacle for female entrepreneurs. The study also found that usage of social platforms is challenging for the elder generation which restricts them of marketing their businesses. The results highlight the significance of programs and policies that deal with work-life balance, offer helpful infrastructure, improve digital literacy, and foster intergenerational learning. The findings help policymakers, stakeholders, and women entrepreneurs to design strategies to support female entrepreneurship.

Ismoil DUSTAMBAEV

University life must be cognitive, demanding, and enjoyable, and UCA has provided me with this range of feelings. I am glad for all of the abilities I have gained here, as well as the memories that will stay with me forever.

Female Ownership Share and the Gender Wage Gap in Developing Countries

The gender wage gap is a structural inequality that affects women in all the countries. It is more pronounced in developing countries due to cultural traditions and difficulties in accessing employment and education for women. Women may be paid less for the same work as men, which negatively affects them and their families. This study aims to determine if the female business ownership share narrows the gender wage gap in developing countries. It is based on secondary data from the World Bank Enterprise Surveys and the impact of several independent variables on the gender wage gap is statistically significant. More variables such as academic performance, the proportion of women who own their own firms, and career goals can be included to make more precise inferences.

Khizrdod NAZAROV

My UCA journey has been a catalyst for lifelong friendships and endless opportunities. I am forever grateful for the transformative impact it has had on shaping me into the person I am today.

The Impact of Research and Development on Firm Performance in Central Asia

This paper studies the impact of research and development (R&D) on the performance of firms in Central Asia using both descriptive statistics and linear regression analysis. This study investigates the relationship between R&D expenditures at the firm level and three dependent variables: sales growth, sales in 2016, and sales in 2018. The analysis controls for firm size, industry, gender of the top manager, and country. The findings suggest that there is no significant relationship between R&D and firm's performance in Central Asia. The hypothesis that R&D has a positive effect on sales and average sales growth is rejected. The paper suggests policy implications for firms and governments in Central Asia, highlighting the need for additional research and potential policy and investment strategy adjustments.

Khonum
VAFODOROVA

During my transformative five-year experience at UCA, it became my cherished home, providing unforgettable opportunities for personal and professional growth. The remarkable individuals, valuable *internships, memorable exchange semester, diverse conferences, enriching research projects, and profound knowledge acquired have all contributed to my unique journey at UCA.*

The Impact of Maternal Education on Child Health: Evidence from Tajikistan

This study examines the relationship between maternal education and child health outcomes in Tajikistan. Using data from the 2017 Tajikistan Demographic and Health Survey, logistic regression analysis and marginal effects are used to determine the influence of maternal education on child stunting, wasting, and underweight. Although the results are not statistically significant, the analysis reveals a consistent pattern indicating that higher levels of maternal education are linked to a reduction in both stunting and underweight among children. The results suggest a possible gender difference in nutritional outcomes associated with maternal education. In addition, rural residence and lower household wealth are related to increased rates of stunting, underweight, and wasting. There are observed regional disparities, with certain regions exhibiting reduced rates of malnutrition. Improving child nutrition in Tajikistan could be facilitated by encouraging women's access to education, implementing targeted interventions in rural areas and disadvantaged households, and promoting regular prenatal care visits.

Mahtob
MIRZOJONOVA

UCA has been my home away from home, where I have grown academically, socially, and most importantly personally. I will forever cherish the memories, friendships, and valuable lessons gained during this transformative chapter of my life.

Economic Analysis of Small Greenhouse Models in Remote High-Altitude regions: A Case study of GBAO, Tajikistan

This study investigates the costs and benefits associated with small greenhouses in remote villages of GBAO, Tajikistan. Employing a case study methodology, interviews were conducted with farmers in four remote villages to gather empirical data. The research methodology integrates cost accounting and cost-benefit analysis, utilizing financial indicators such as Net Present Value, Internal Rate of Return, and Benefit Cost Ratio. The findings highlight that small greenhouses significantly contribute to enhancing the dietary diversity of farmers and their neighbors. However, the initial investment results in substantially higher production costs that may not align with prevailing market conditions. The profitability of greenhouse models depends on the inclusion of capital costs. Therefore, a thorough examination of all costs and benefits is recommended before farmers make these investment decisions. This research provides valuable insights into the economics of small greenhouses in remote areas, emphasizing the importance of comprehensive decision-making processes for sustainable agricultural practices.

Malika
SHOGUNBEKOVA

Graduation is a ride of emotions, with the thrill of conquering academic challenges and the excitement of entering the real world! It's a mix of "Yay, I made it!" and "Wait, what do I do now?" But hey, let's still invite our parents, toss those hats, and embrace the unknown with a dash of curiosity and a sprinkle of optimism. After all, life is about to hand you a diploma and say, "Congratulations, you've completed the easy level of life!" So let's get ready for the real challenges and keep prospering!

The Impacts of the UCA SPCE Business and Professional Education Program in Khorog on Entrepreneurship, Employability, and Income

This thesis examines the impacts of the Business and Professional Education programs at the SPCE in Khorog. Using survey data from graduates between 2016 and the present, the study evaluates the effects of these programs on goal achievement, entrepreneurship, employability, and incomes of participants. Findings reveal that the business courses effectively help participants achieve their goals, enhance entrepreneurial knowledge and skills, and start their own businesses. The study also highlights the development of essential soft skills in communication, problem-solving, and leadership. Additionally, professional education programs contribute to specialized knowledge and professional skills. Positive employment outcomes are observed, with graduates finding jobs, advancing their careers, or receiving promotions. Limitations include self-reported data and limited generalizability. Future research should consider longitudinal studies and explore factors influencing employment and entrepreneurship outcomes. This study adds insights to the literature on business and professional education, informing educators, policymakers, and stakeholders on program enhancements.

During my time at UCA, I thrived thanks to the wide range of academic and personal growth opportunities. Engaging in on and off-campus internships helped me broaden my network and develop vital career skills.

The outstanding facilities, supportive staff, and privacy offered a comfortable environment, igniting my personal growth.

The Relationship Between Land Size and Agricultural Productivity in Kyrgyzstan

The purpose of the study is to understand the relationship between land size and productivity in Kyrgyzstan and the impact of other factors on this relationship. Data on the agriculture sector and households have been taken from LiK data for the years 2016 and 2019. Panel pooled regression and panel quantile regression analysis is done by taking the log of crop value as the independent variable and the log of the area as the main independent variable. The finding of the study suggests that the conventional inverse relationship hypothesis does not hold in the case of the Kyrgyz agricultural sector and other factors have a significant effect on this relationship. The research findings suggest that the government should take action to improve productivity by strengthening infrastructure and providing education on market conditions.

Naima
MAMADRASULOVA

At the University of Central Asia, I discovered my intellectual curiosity, nurtured a diverse network, thrived amidst challenges, and grew immensely, personally *and academically. Forever grateful for this transformative, life-altering journey.*

Analyzing the Growth Rates of Agricultural Production in Central Asian Countries

This research examines agricultural production growth in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. The 2000–2019 data shows trends, patterns, and fluctuations of agricultural production in these nations. Human capital—education, skills, and knowledge—is also examined in relation to agricultural growth rates. Kazakhstan and Turkmenistan have periods of great growth and also significant decreases, showing agricultural sector fluctuations. Kyrgyzstan has mild fluctuations and no persistent growth. Tajikistan's agricultural productivity grows steadily. Uzbekistan's constant growth rates and sustained modest growth show stable and effective agricultural development. The analysis also examines agricultural growth rates and human capital in each country. Human capital investments are correlated with agricultural output and efficiency, although the relationships vary. Overall, this study highlights the need for comprehensive strategies that address climate conditions, agricultural policies, infrastructure, technology, and access to markets in Central Asia.

Nisar
ALI

Accounting for Growth: Comparing Bangladesh and Pakistan

This study aims to provide a comparative analysis of growth in Bangladesh and Pakistan through a growth accounting framework using the Solow Growth Model with an aggregate production function. Results reveal that, over the entire period from 1971-2019, the average growth rate of output per worker was 1.86% in Bangladesh from which the contributions from capital stock, human capital and total factor productivity (TFP) were 1.38%, 0.81%, and -0.33% respectively. While in Pakistan the average growth rate of output per worker for the entire period was 2.09%. The contributions from capital stock, human capital and TFP were 0.41%, 0.53%, and 1.15% respec-

tively. Bangladesh's growth rates of real output and output per worker were impressive compared to Pakistan over the entire period aside from the first two decades. The study further identifies that both countries have moved away from agriculture and have developed their industrial and services sectors which are now the main contributors to their GDP.

Rashodkhuja RUSTAMOV

This has been an extremely difficult and rewarding journey, full of both stress and reward. Because life is full of opportunities,

I can't wait for the next exciting chapter to begin.

An Inquiry Into the Existence of Geographically Clustered Firms: A Case Study of the Sughd Region

This study investigates Tajikistan's clustering initiatives and economic competitiveness, focusing on the cotton-textile cluster in the Sughd region. Using both secondary and primary data, this study examines the performance and challenges of various regional sectors. The findings disclose disparities in average revenue per sector and city, with Khujand emerging as an important center for industries such as cotton, sewing, footwear, and carpets. The study highlights the significance of clustering in fostering collaboration, market access, specialized labor, and shared resources. However, the report also identifies obstacles, such as a lack of competent labor, inadequate infrastructure, and limited government support. The survey of primary data provides valuable insights into the current state of the cotton-textile cluster and highlights the opportunities and challenges confronted by regional businesses. The study suggests implementing supportive government policies, financial incentives, and business incubation programs to boost the cluster's development and competitiveness.

Sabrina GULMAMADOVA

Stock Market and Economic Growth in Kazakhstan: An Application of the ARDL Model

Financial markets play a crucial role in promoting economic development, specifically highlighting the benefits of a well-functioning stock market in facilitating capital access for firms and fostering investment in new projects. Kazakhstan in recent years has grown rapidly, nonetheless several challenges remain. This paper explores the role of the stock market in promoting economic growth, based on the example of Kazakhstan. The study analyses the relationship between the stock market and economic growth in Kazakhstan from 2000 to 2023 using the Autoregressive Distributed Lag model. The ARDL results demonstrate that there is a link between real GDP and variables such as Money Supply (2), Population, Stock Market Index, Money Market rate and Foreign Direct Investment. Studying the economy of Kazakhstan provides insights relevant for other emerging market economies. Granger causality tests show a bidirectional causal relationship between the stock market and economic growth.

Tolibsho MUBORAKSHOEV

UCA provides a pluralistic environment for students. The environment is nurtured by the diversity of students' backgrounds and cultures. I will certainly keep contact with my course mates in future. I was privileged to be part of the UCA family which helped me to gain knowledge about the Central Asian economies on macro and micro levels. UCA connects the bridge with international organizations through internship programmes. During my internship I had travelled to different regions of Tajikistan and witnessed the socio-economic conditions. It was

an unbelievable experience. UCA faculty members are high-caliber specialists from different countries which are ready to support students. They cater to different learning styles of students and they are role models for me. And last, I would like to say that UCA improved my knowledge, skills, competencies, and provided me with a rich experience which I believe will have positive impact on my life in the future. It changed my life. Thank you!

The Characteristics of Credit Access in Rural Areas and its Impact on Food Security and Economic Development in Kyrgyzstan

Agriculture is the backbone of the Kyrgyzstan economy, accounting for 14.7 percent of GDP in 2021. It also plays a crucial role in food security, employment opportunities and the resilience of the population in rural areas as well as the economic development of Kyrgyzstan. According to the IFAD report in 2019, 62 percent of the 6.45 million Kyrgyz population live in rural areas. Currently, the importance of the agriculture sector is increasing due to global crises such as: COVID-19, climate crises and geopolitical situations, which are leading to an exacerbation of the 'food insecurity' and 'vulnerability to poverty' problems in developing countries. This study aims at investigating the characteristics of credit access in rural areas of Kyrgyzstan and to provide recommendations on ways to enhance credit flows for smallholder farmers, which can contribute to improving food security and economic development in the country.

Wajahat Ali
KHAN

I am filled with a sense of accomplishment, gratitude, and profound anticipation as I approach graduation from UCA with my Bachelor's degree in Global Economics. I cherish the knowledge and friendships I've gained here and the enriching experience from my semester in Norway. As I step into the post-grad life, I aspire to leverage these experiences to contribute meaningfully to the global economic sphere, and I am excited to embrace new challenges and opportunities that await.

Examining the Causal Relationship Between Public Debt, Growth, Economic Crisis, and Private debt: A PVAR Approach

This paper studied the causal relationship between real GDP growth and central government debt in the presence of economic crisis and private debts (loans and securities) by applying a Panel VAR and multivariate Granger Causality tests for a balanced panel of 51 developed and developing countries for the period of 1996-2016. The results of the multivariate Granger causality tests revealed a weak bi-directional causality between economic growth and public debt. PVAR analysis was used to estimate bivariate, trivariate, and quadrivariate models for the full sample and subsamples of developed and developing countries. The findings support the hypothesis that high economic growth decreases debt, but the reverse effect is rarely true. This study incorporated two economic crisis measures, and private debts, to observe the debt-growth nexus from a different perspective. Such an approach has not been extensively examined in the current literature on debt and growth.

Zainab MUBORAKSHOEVA

My journey at UCA was nothing but incredible. I got closer to my roots, I gained knowledge, grew as a person and professional, and made friendships that I am sure will last a lifetime. I took a first step on a path of growth here and will forever cherish our beautiful alma-mater. The motto of our class was "Mountains of Opportunities", and now that we have conquered the summits of the Pamiri mountains, I am eager to explore what is beyond them.

Gender in Agriculture: An Investigation of Productivity Differences in Household Farms in Kyrgyzstan

Women's involvement in agricultural development is a pressing issue in agricultural policy discussions, given its importance for overall economic development and welfare. However, discrimination hampers women's participation in agricultural markets, land ownership, financial services, and labor, resulting in male-managed farms outperforming female-managed farms. This gender gap in agricultural employment persists in Kyrgyzstan due to traditional gender roles and power imbalances. Female-managed farms face specific challenges, and government policies are crucial for supporting their growth. A multiple linear regression model was employed in this study to examine factors influencing crop yields, highlighting the gender of the household head, geographical location, and agricultural practices. The results indicate that female household heads are associated with lower vegetable yields, while the age of the household head has no significant effect. Agricultural practices such as machinery use, tillage, insecticide application, and the presence of erosion/salinity also influence crop yields.

Earth and Environmental Sciences

Ahmad
GULBEKOV

Landslide Analysis Using Sentinel-1 Backscatter Products in Rushan District

This study examines landslides in Tajikistan, with a focus on the Rushan District in High-Mountain Asia. The purpose of the study is to generate maps for landslide detection and educate researchers on how to use Python and SNAP/ArcGIS Pro for Sentinel-1 analysis. Coregistration, InSAR processing, geocoding, subsetting, and data export are components of the methodology. Coherence and Phase rasters with varying chronologies constitute the foundation for landslide analysis. Secondary results identify minor landslide sites and shed light on their properties. The study focuses on the broader analysis opportunities provided by the Copernicus Program and Sentinel satellites. This research contributes to the understanding and mitigation of landslides in Tajikistan and functions as a practical resource for those interested in landslide analysis using Sentinel1 data and associated tools.

Anisa ZARJUMIEVA

The Impact of Climate Change on Agricultural Productivity of Gorno-Badakhshan Autonomous Oblast, Tajikistan

Climate change is a global phenomenon that is altering the earth`s climate and its effects are being felt worldwide. As a result of human activities including the combustion of fossil fuels, deforestation, and other industrial operations, the climate has changed significantly. The consequences of climate change are changing weather patterns, rising temperature, rising sea level, and many others. Agriculture is one of the sectors that is highly vulnerable to climate change, and it has been affected by climate change significantly. Therefore, the aim of the study is to identify how climate change is impacting the agricultural productivity of Gorno Badakhshan Autonomous Oblast (GBAO), Tajikistan. This is an important topic for conducting research because Tajikistan is highly dependent on the agricultural production. The study employed three types of methodologies to analyse the correlation between climate variabilities and yield production. The statistical analysis demonstrates that the rise in temperature is leading to the decline of the yield production in GBAO. The limitations of the research are stated and based on the results and discussion section, some recommendations for mitigation and adaptation strategies for climate change were mentioned.

Fariya BAIG

A Review on Physiochemical and Microbiological Testing of Drinking Water in Khorog

Drinking water quality analysis plays a vital role in assessing the safety of the water resources and ultimately helps in safeguarding the health of human, and ecosystem. This study focused on the drinking water quality analysis in Khorog. Khorog is a remote and vulnerable area with bountiful water resources but with limited water management. This paper used the water quality data collected by Aga Khan Agency for Habitat to assess and analyze the methods used to evaluate the physical (pH, temperature, turbidity, electrical conductivity, Total Dissolved Solids and Alkalinity), chemical (nitrate, nitrite, mercury, arsenic, copper, lead, zinc, magnesium, calcium, chlorine, chloride and hardness), and biological parameters (colony forming units of Escherichia coli). Further, it estimated the Normalized Difference Turbidity Index for monitoring of open water bodies used for drinking water. It reasoned about any agricultural runoffs, wastewater, or sedimentation of the water. Integration of these indices facilitates comprehensive water quality analysis, aiding in the identification of pollution sources, monitoring water treatment efficiency, and supporting decisionmaking processes for water management and safe drinking protocols. Remote sensingbased water quality analysis looked at the potential to enhance monitoring capabilities, allowing for timely and informed actions to safeguard water resources and ecosystem sustainability.

Khushruz SAIDIBROIMOV

Environmental and Social Impact Assessment of Charthem Hydro Power Plant

Environmental and Social Impact Assessment (ESIA) is a critical process that involves evaluating the potential environmental and social impacts of a development project (Law Insider). Conducting an ESIA allows us to understand the potential effects of a project before its construction and subsequent development. The decision to implement a project is often based on the findings of the ESIA, which may influence government entities, organizations, or other stakeholders. The Charthem Hydro Power Plant (HPP) is planned to be constructed in the Gund river valley within the Gorno – Badakhshan Autonomous Oblast (GBAO) of Tajikistan. The Charthem HPP has the potential to contribute significantly to the socioeconomic development of the Charthem village and the Badakhshan region as a whole. While development initiatives like the Charthem HPP offer economic benefits, they also carry risks of adverse impacts on the environment, local communities, and livelihoods. The environmental and social effects of the Charthem HPP have not yet been evaluated, making it necessary to assess the Environmental and Social Impacts of the Charthem Hydropower Project in this thesis proposal. The evaluation will place particular emphasis on conducting an environmental and social impact assessment, which is vital for guiding the project's subsequent implementation processes.

Mavluda
CHINIEVA

Possibility of Greening (Planting Trees) in the Center of Murghab District

Due to its arid climate and limited precipitation, the Murghab district in the Eastern Pamir region confronts numerous environmental challenges, including desertification, land degradation, and soil erosion. However, the implementation of greening strategies, particularly tree planting, can provide numerous benefits for the environment and local communities, such as the improvement of soil fertility, the modification of climatic patterns, and the provision of food sources. The success of these strategies is contingent on the local climate, resource accessibility, and population support. Therefore, it is crucial for their long-term viability to involve the local community in planning and execution. In the Murghab district, soil conservation practices, water harvesting techniques, and afforestation can help restore degraded land and promote vegetation growth. However, it is crucial that these strategies be implemented without affecting the local biodiversity and ecosystem. Greening arid regions is essential for preventing further land degradation, desertification and preserving the natural world for future generations. This research is devoted to a comprehensive analysis of whether establishing trees in the Murghab district's central region would be beneficial. This plan's prospective implementation will, in the long run, contribute to the preservation of the natural environment and help moderate the local climate.

Nitasha

Sustainability Principles in Practice: Assessment of Solid Waste Management – A Case Study for Pakistan

With the ever-increasing growth in population and incomes, municipal solid waste generation is projected to rise. As a result, issues arise, especially in developing countries where waste management is not optimized, and the gaps in the management structures go unnoticed until they escalate into a crisis. This exploratory research examines these gaps in the case of Gilgit, Pakistan, provides an overview of the system, and identifies the subsequent environmental, economic, and social implications. By conducting a qualitative study in Gilgit and reviewing the existing literature on the topic, this research uses the United Nations - Habitat's integrated waste management framework to assess the current system's effectiveness and finds the undervalued contributions of the informal sector, the system's need for inclusivity, transparency, accountability, and the establishment of sound financial provisions. Addressing these gaps, the study presents contextual recommendations in governance and operations to facilitate the transition toward sustainable systems.

Rabia
FAQIR

Assessing Environmental Awareness and Education in University Students of Gilgit Pakistan and GBAO Tajikistan

This paper investigates environmental awareness and education among university students in Gilgit, Pakistan, and GBAO, Tajikistan. A qualitative survey with III participants was conducted, and a literature review was done to validate information. In Gilgit, findings show the year of study and the amount of time spent on social media do not have a significant influence on environmental awareness. However, the field of study influences environmental awareness, with natural science students exhibiting pro-environmental behavior. Students from higher socioeconomic backgrounds possess good environmental knowledge but display less eco-friendly behavior. Conversely, students from lower socioeconomic backgrounds rank lower in both environmental knowledge and behavior. Students belonging to indigenous communities in Gilgit reported unsustainable waste management practices, and the number of disasters experienced is directly related 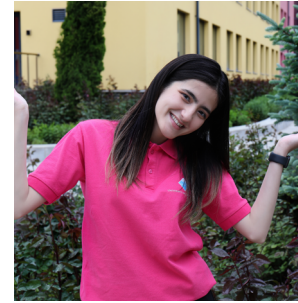to environmental knowledge. In GBAO, socioeconomic status and media exposure do not appear to significantly influence environmental awareness. However, the year of study has a significant impact, with third- and fourth-year students displaying greater knowledge. The field of study also influences environmental awareness, with computer science students being less aware. Students from indigenous communities in GBAO reported unsustainable waste management practices and a high-risk perception of disasters. The number of disasters experienced also impacts environmental awareness, as those affected by more disasters believe their communities will be impacted in the future and are more aware of reusing items. This research has limitations, including a small sample size, online survey dissemination, and potential language barriers. Nonetheless, it provides valuable insights into environmental awareness in rural mountainous communities, guiding efforts to improve awareness in these areas.

Rasina
SHAMIROVA

Cultivation OF Ornamental Plants "Roses" in Mountainous Regions: The Case of Khorog

Rose cultivation in mountainous regions presents a unique set of difficulties and opportunities. This diploma thesis examines the instance of Khorog, a mountainous region renowned for its diverse flora and challenging climate. The study investigates the viability of rose cultivation in Khorog by analyzing temperature, humidity, precipitation, soil requirements, and cultivation methods. It also examines the aesthetic appeal and symbolic significance of roses throughout human history, as well as their historical and cultural significance. This thesis seeks to provide valuable insights into the viability and potential of rose cultivation in Khorog's mountainous terrain through a combination of literature review, field observations, and interviews with local rose cultivators. This dissertation's findings and recommendations can serve as a valuable resource for rose cultivators, researchers, and agricultural practitioners interested in the cultivation of roses in similar mountainous regions.

Rudoba IMRONSHOEVA

The Impact of Climate Change on Food Security in Bartang and the Effectiveness of the Ecological Calendars to Adapt to the Changes

The study aims to study the impact of climate change on food security in Savnob village, Bartang district, and evaluate the effectiveness of the traditional knowledge to adapt to the changing environmental conditions. The community of this village is actively engaged in agricultural practices for their livelihood. Historically, the people accumulated their knowledge and create calendars that were used to find the optimal planting and harvesting time. However, the changes introduced to the calendars by the environmental patterns have made them ineffective in mitigating the impacts of climate change on food security. The paper is based on a mixed-method approach, including semi-structured interviews, relevant literature, and remote sensing data analysis of temperature and precipitation patterns. The result of the paper shows that climate change has a predominantly negative impact on the food system in Savnob village rather than positive impacts. The paper analysis indicates that revitalizing the ecological calendars alone is not enough to ensure food security. There must be implemented some new adaptation approaches by the community to improve the health of the soil and to cultivate heat-resistant crops. This research is important for farmers and stakeholders involved in agriculture and climate change adaptation in Bartang.

Sabrina MUZAFARI

Spatiotemporal Assessment of Snow Water Equivalent in the Gunt Catchemnt Using Remote Sesing Products (2000-2023)

The goal of the current research is to assess the performance of the NASA FLDAS remote sensing product in the study of snow water equivalent in high-altitude regions. With Gunt catchment in the Tajik Pamirs as the study area, the performance of FLDAS was evaluated using ground truth points. The initial 7.7 cm root-mean-square error was reduced to 4.9 after the calibration. For the period 2000–2023, trend maps of SWE changes were produced for the months November–April. The persistent evolution of the eastern Pamirs towards drier snow in contrast to moister snow in the high-elevated areas in north-western, western, and central Gunt can be observed in the change of snow water equivalent trend maps. Findings on snow should be of primary interest for the snowmelt-dependent, water-rich countries of Central Asia. Agriculture, energy production, and water security are among the high-concern sectors to be affected by adaptation to a warming climate cryosphere.

Shoaib ATAYEE

Early to Late Cretaceous Volcanic Rocks of the Southern and Central Pamir, Tajikistan; Constraints from Mineral Chemistry

The Pamir was created by the merging of the Central, South, and North Pamir terranes throughout the Paleozoic (541-253 Ma) and Mesozoic (252-66 Ma). Following this, the terranes were distorted during the India-Asia collision in the Cenozoic, creating a complex tectonic development of the Pamir. However, it is difficult to determine if the precise degree of convergence is connected to the Cretaceous or the Cenozoic, creating an unreliable crustal deformation to detect (Robinson, 2015). Just within the Central Pamir, we have Early to Late Cretaceous volcanic rocks which could provide valuable information about the tectonic setting and plateau formation of the Pamir, which we would be focusing on by doing mineral chemistry and petrography analysis in this paper. This study examines the petrography and mineral chemistry of Central Pamir (Bartang) volcanic rock samples to determine their geological and evolutionary history. The result of the petrograph-ic study indicates extrusive volcanic eruptions and volcanic ash deposition. Mafic metamorphic and igneous rocks suggest strong igneous activity and metamorphism. Mineral chemistry reveals rock composition and tectonic setting. Magnesio-hornblende and magnesio-sadangaite minerals indicate a mixed crust-mantle source and interactions. Subduction zones with volcanic arcs and sub-alkaline compositions are close to the surface. Potassium-rich feldspars and oligoclase-rich plagioclase minerals indicate metamorphic, granite, and syenite rocks with either gradual cooling or fast crystallization. This study illuminates the geological complexity and tectonic evolution of the Central Pamir (Bartang) volcanic region, emphasizing the necessity for more comprehensive research to better understand its rock types and geological processes.

Suhaylo GHARIBOVA

Detection and Prediction of Land Use and Land Cover Change in Shugnan District and Khorog Town of GBAO Using GIS and Remote Sensing

This research focuses on landscape alteration via land use and land cover change (LULCC) analyses in Tajikistan's Gorno-Badakhshan Autonomous Region's Shughnan District and Khorog Town. The study analyses changes over a nine-year period (2013-2022) and anticipates future transitions till 2035 using remote sensing and GIS technology. The data show major environmental changes, such as a reduction in snow cover and an increase in exposed soil and rocks, as well as urban growth. To preserve the environment, it is critical to carefully monitor these changes and adopt preventative steps. Policymakers may make informed choices to maintain sustainable land management, preservation, and economic growth practices by using modern technology and predictive models.

Tazarf
SHAMIROVA

GIS-Based Flood Vulnerability Analysis in Darvoz District, GBAO, Tajikistan

GIS was used to assess Darvoz's flood risk. The study examined altitude, slope, drainage density, land-use-land-cover (LULC), rainfall, soil type, and precipitationtemperature association. Low-lying areas, especially near water or drainage systems, were more susceptible to flood. By altering water flow patterns, higher altitudes reduced downstream flooding. Climate change has been related to rising sea levels, greater precipitation, which can increase flood risks in Darvoz. Water features and riparian vegetation were observed in the river corridor LULC. Clay loam and loam soils with poor drainage and water retention increased flood danger. Data precision and resolution, local hydrological data availability, topographical data quality, local expertise, and climate change were shown to be limits. Policymakers were advised to prioritize post-flood recovery, adapt to changing climate conditions, adapt infrastructure, early warning systems, community participation, interagency cooperation, knowledge sharing. The GIS-based research revealed the Darvoz district's flood vulnerability and provided recommendations for strengthening flood management and resilience in decision-makers.

Ubaid
SAYEDI

Study of Pshart Range Triassic Basalts of Murgab District, Tajikistan

The study of the Pshart range Triassic basalts of Murgab district, Tajikistan provides important information about the source of magma and tectonic setting of Gumbezkol basalts erupted during Triassic. The geological history of this region shows that Rushan-Pshart suture indicates the remnants of the Meso-Tethys ocean which closed in late Triassic. Pshart formed as the accretionary complex of Southern Pamir as the Central Pamir was moving toward Southern Pamir. In this thesis we study the field relations and petrography of the basalt samples. The whole rock geochemical data including major and trace elements of XX basalt samples are used to decipher their magma type and tectonic setting. The result of this research shows that Gumbezkol basalt was originated from plume magmatic activities and magma of these rocks originated from a mantle source. The studied basalt samples are of Oceanic Island Basalt type, formed by hot spot activities as Gumbezkol seamount.

Zaynura KAYKOVUSOVA

Landslide Risk Assessment for Tusyon Jamoat Area of Roshtqala District, Tajikistan

This study focuses on assessing landslide susceptibility and developing risk reduction strategies in Tusyon village, Tajikistan. Using historical data, GIS, and remote sensing analysis, the spatial distribution of landslides was evaluated. The findings reveal a significant history of landslides in Tusyon village, necessitating proactive measures for risk reduction. A landslide susceptibility map was generated, highlighting areas at high risk. This research provides valuable insights for land-use planning and management to minimize the impact of landslides on the local community and infrastructure.