



UNIVERSITY  
OF CENTRAL ASIA

SENIOR DIPLOMA BROCHURE  
**THE CLASS OF 2022**

## **Prof. Dr. S. Sohail H. Naqvi**

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### **Rector**



The senior project showcases the application of knowledge acquired by the students to address “real-world” concerns and problems. It represents an opportunity for the students to work with their respective faculty advisors on issues that are important to them. As such the project is also a window into the student’s mind and heart.

It is absolutely wonderful to see the diversity of projects and their caliber and would like to record my deep admiration and appreciation for the tremendous effort put in by the students and their faculty advisors, in creating these outstanding projects.

## **Prof. Dr. Maxim Khomyakov**

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### **Dean of the School of Arts and Sciences**



The year of 2022 represents a historic milestone in the still short history of the UCA School of Arts and Sciences. A central element of this moment, in its turn, is a defense of the diploma theses, varying from practically oriented capstone projects to fundamental research works. For a long time, 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. It gives me a great pleasure to say that our hopes came true and the School of Arts and Sciences can be proud of its graduates.



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# 04 COMMUNICATIONS AND MEDIA

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## Aigerim Dzhaanbaeva

### THE ROLE OF MEDIA COVERAGE OF BORDER CONFLICTS IN SHAPING PUBLIC OPINION: THE CASE OF THE 2021 KYRGYZSTAN-TAJIKISTAN BORDER CLASHES

#### Abstract:

This paper explores how media coverage of border clashes between Kyrgyzstan and Tajikistan in April 2021 affected Kyrgyzstanis' perception of the neighboring nation. Having a tremendous influence, the media can form and shape public opinion. Kyrgyzstan's media outlets have used the common practice of framing theory to present and highlight specific news that led to certain interpretations among the audience.

For the data collection and analysis, this paper adopts a qualitative method focusing on semi-structured in-depth interviews, internet-based surveys, and content analysis. This paper finds that the media coverage of the border conflict between Kyrgyzstan and Tajikistan gained the wide attention of news consumers on social networks, not having a significant shift in people's perception of the conflict.

#### Statement:

*I am glad that my university experience has been smooth and enjoyable, full of fun and learning.*



## Aigerim Iliasova

THE INFLUENCE OF CULTURE AND PATRIARCHAL  
THINKING ON DOMESTIC VIOLENCE IN KYRGYZSTAN.  
MEDIA COVERAGE OF THE PROBLEM.

### Abstract:

Violence against women is widespread in Kyrgyzstan. The number of cases of domestic violence is increasing every year. Since the beginning of the Covid-19 pandemic, the situation has become even worse. This information is only based on the number of registered cases. Unfortunately, the exact number of women, who are afraid to turn to someone and continue to suffer from domestic violence is unknown. Many women experiencing domestic violence are scared to talk about it, therefore people do not know the actual size of the problem. There is a fear to openly talk about the on-going domestic violence because the victims think that they will be judged by the community. The culture of the Kyrgyz people asserts that "the women should not wash dirty linen in public." meaning that it is not ethical to disclose and share the family issues with the outsiders. Another common belief is that the police will not help due to the

assumption that the family issues must be solved inside the family. There were cases when police officers took abusers' side and protected them instead of victims as they consider it a normal thing to beat up a spouse. Moreover, women in Kyrgyz culture live with a notion that the man is the head of the family and that anything he does is correct and must not be disputed. As a result, the purpose of this paper is to reveal the way the Kyrgyz patriarchal thinking and culture affect the incidence of domestic violence, and the way the media reports the domestic violence cases.

### Statement:

*Almost three years ago, I interviewed a woman for an assignment and realised how huge is the issue of domestic violence in Kyrgyzstan, and since then I have been interested in the topic.*



## Aisha Nugmanova

IN WHAT WAYS COULD THE VICARIOUS EXPERIENCE OF VIRTUAL FEMALE CHARACTERS IN VIDEO GAMES AFFECT THE MASCULINE PERCEPTION OF FEMALE IDENTITY AND ROLE IN CENTRAL ASIAN SOCIETIES?

### Abstract:

This pilot study attempts to determine whether our in-game experiences could reflect onto the real life. To be more specific, I will be analyzing whether exposure to stereotypical female video game characters could change the masculine perception of female representation and attitude towards females in Central Asian society. The paper includes three stages of data collection process and the theoretical framework is based on Social Learning Theory. As this is only a pilot study with a small sample pool, the following results do not represent the whole Central Asian population. The findings suggest that in majority of the cases, male video games players are able to discern between real and vicarious experiences of females. Their prolonged exposure to virtual females does not

affect in any way their perception and attitude towards women. However, there are some exceptions of subconscious projection of one's in-game expectations of female appearance and behavior. This study is significant in a way that it might be helpful to a wide range of audience identify gender-based trends in video games and understand how they may affect player's perception towards females.

### Statement:

*My senior year research project went well. I learned a lot from this experience, especially about the importance of a supervisor. I have been lucky to have had a supportive mentor.*



## Aizhamal Biigazieva

### SENSE OF BELONGING AND PORTRAYAL OF HOME AND NATURE IN THE THREE KYRGYZ FILMS: THE SKY OF OUR CHILDHOOD, SUTAK, AND CENTAUR

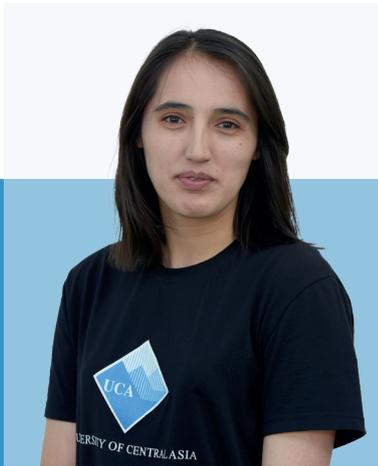
#### Abstract:

One's national identity has always been a topic of reflections. What is it? What are its components? Why is it important? Who shapes it? The list of questions might go on. I started questioning my own identity in the adolescent years, which led me to the identity crisis. I observed the society around me and saw my compatriots going through the same process of questions of their identity. The notions of home and sense of belonging form an individual and the society as a whole. You feel incomplete when you do not know where you belong to. I tried to share my own understanding of my identity in this research which made it autoethnographic. Moreover, the sense of belonging and home are

eternal themes in Kyrgyz cinema. The concepts of home, identity, and belonging often appeared in films produced during the Soviet era and are equally portrayed in post-Soviet Kyrgyz films. Therefore, this research focuses on the sense of belonging and portrayal of nature and home on the three Kyrgyz autoethnographic films: *The Sky of Our Childhood* (1966), *Sutak* (2015), and *Centaur* (2017).

#### Statement:

*Studying at UCA was a long and thorny path, but it is what made my life as it is now. I met amazing people along the way, cried bitter tears, and had the best laughs. Eventually, I am who I am today, and will be forever grateful for this experience.*



## Anisa Alinazarova

### A STUDY OF KHOROG RESIDENT'S ATTITUDE TOWARDS AFGHAN REFUGEES: A COMPARISON OF SOCIAL MEDIA COMMENTS VS INTERACTIONS ON THE GROUND

#### Abstract:

Tajikistan is one of the countries that has a hostile relationship with Afghanistan due to their near proximity. In many places along Tajikistan's border with Afghanistan, the countries are separated by only a few yards of water, the narrow Panj River. Tajikistan has been the only neighbor of Afghanistan that has been publicly opposing the Taliban movement, since they took power in Afghanistan. In August 2021 the Taliban have taken control of Afghanistan with plans to turn it into an Islamic state. This situation worries lawmakers throughout the world. Analysts are afraid that the terrorists may infiltrate Afghanistan via neighboring countries and spread to other countries. The focus of this research is to understand what the attitude of the local residents of Khorog is towards the recently arrived refugees. The main questions to be examined: What is the attitude of the local people of Khorog towards the refugees

from Afghanistan on social media vs those on the ground? My purpose is to investigate local residents' attitude to the presence of refugees in Khorog. Specifically, this study will look at how values, beliefs and assumptions were communicated during the refugee crisis. The research methodologies will involve interviews with local people living in the city, since this study aims to examine the impact of the refugee's presence in the region. It will also examine social media posts during the same timeframe.

#### Statement:

*During my five years at UCA, I was able to improve the way I learn and connect with my fellows and professors to a point that it has helped me to mature into a better person.*



## Aqila Hassanzada

### STORY OF RESETTLEMENT: AFGHAN REFUGEES IN BISHKEK, KYRGYZSTAN

#### Abstract:

This research project presents findings from a qualitative study of resettlement stories of Afghan families from refugee backgrounds in Bishkek, Kyrgyzstan. The paper focuses on the factors affecting the well-being of current refugees, which include practical, socio-economic, cultural, and emotional challenges described as significant resettlement barriers in adjusting to life in a foreign country. Reporting upon interviews with these families, I employ the concept of resilience while discussing interview participants' narratives to understand their process of developing resilience and how it has shaped their survival all these years. Additionally, as an Afghan refugee, the author places herself in the centre as a concurrent self-narrative to investigate and narrate the challenges of these families. This research finds that the hopes these refugees carried with them upon their arrival to Bishkek no longer exist as they face

the reality of not being able to resettle on an official basis with proper documentation and recognized immigration status. And, as a result of not receiving the support needed to settle and start a new life, developing resilience is the only factor contributing to Afghan refugees' coping processes to overcome resettlement difficulties and adjust to life in Bishkek.

#### Statement:

*When I applied for UCA back in 2017, I only aimed to receive a quality education, but the five years I spent here have offered me so much more than that. This place not only gave me a chance to learn the analytic, communication, and strategic leadership skills, but it also provided me with several opportunities where I was able to apply those skills to tackle societal challenges. I can now proudly say that I am a UCA graduate and take ownership and responsibility for what that entails.*



## Davlatsulton Bulbulova

### THE EFFECT OF COVID-19 ON PAMIRI MIGRANTS IN RUSSIA AND THE USE OF COMMUNICATION TO BUILD GREATER RESILIENCE

#### Abstract:

According to the World Bank, Tajikistan is one of the countries that has the largest remittance economies in the world. Over 1 million Tajik citizens have left the country in search of job in other nations such as Russia due to unemployment. Covid-19 was initially detected in Russia on January 31, 2020, and after a few months, Russia implemented lockdowns. Many events were cancelled, as well as schools, theatres, museums, and the international border. It was a non-working time, and many Tajiks were unable to pay for their accommodation, they didn't have food and job, and desired to return to their homelands, however this was impossible. This research paper examines the Covid-19 impacts on Pamiri migrants in Russia. The significance of the study does not only lie in learning about migrants' experiences in Russia but also in understanding the role of communication during the Covid-19 pandemic, by examining it through a risk communication framework. The research,

therefore, focuses on how Covid-19 affected Pamiri migrants in Russia and how communication was used to build greater resilience. The research will assist in increasing our understanding of the important role of communication during unplanned emergencies. To ensure relevant and reliable information, the research includes interviews with Pamiri migrants in Russia and NGO volunteers. Online in-depth interview was done with 10 Pamiri migrants between the ages of 20 to 50 years old and NGO volunteers who helped Pamiri migrant workers in Russia.

#### Statement:

*While studying at UCA, I learned how to grow as a person and be independent. This period of time has shaped my future. Constantly learning, changing and discovering is a wonderful thing that UCA has taught me. The most important thing is that I have made new friends who will always remain in my life.*



## Jyldyz Sultangazieva

### ANIME CONSUMPTION BY CENTRAL ASIAN YOUTH

#### Abstract:

The concept of soft power has been investigated for the long time, and its importance increases especially now, in the era of globalization. Soft power implies getting desired outcomes by attraction, through cultural, political or moral impact, without applying forces or persuasion. Globalization enhanced intercultural dialogue worldwide, allowing cultures to be spread, shared and exchanged. Thus, the dissemination of a particular country's culture, values and ideas can attract followers from different countries. This research examines a particular

genre of Japanese popular culture - anime and its consumption by Central Asian youth. To examine consumption of anime in-depth interviews and online survey with young anime audience from three Central Asian countries, including Kyrgyzstan, Kazakhstan and Tajikistan were conducted. The research focused on factors making anime popular in Central Asia, examining anime's possible impact on viewers. Finally, the research also examined Japanese popular culture's potential to create and enhance interest in Japanese culture and country.

#### Statement:

*Observing diverse, creative and interesting youth, "experimenting" with their identity, the research focused on the youth subculture. During the project, I found youth free, unique and inspiring.*



## Kanyshai Tolomushova

### SOCIAL MEDIA FOR POLITICAL CAMPAIGNS AND ITS EFFECT ON PUBLIC OPINION

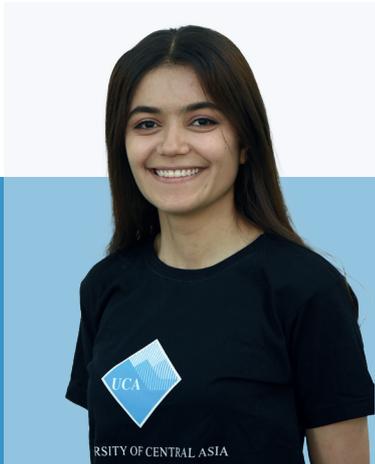
#### Abstract:

Like many communication mediums, social media brought a new dimension to political communication with a big potential to foster democracy. The controversial debate was raised after global practices of using social media in politics like the 2016 US presidential election and fake news, information bubble, affecting public opinion were the main concerns (Allcott and Gentzkow, 2017). However, little research has been done to contribute to this debate from the perspective of Kyrgyzstan. This paper suggests

early observations that social media was participating in forming public opinion during the 2021 presidential election in the country. It will present and discuss the findings from the questionnaires and interviews used to reflect on the information bubbles and the news-finds-me perception theory. The pilot nature of this paper doesn't allow the implication of the results, but it does provide a reasonable theoretical basis for further research.

#### Statement:

*Safe experimenting field – this is what UCA has been for me during these five years. The university has been a place where I got opportunities to embrace my social, technological, and media project ideas, and also experiment in both computer science and communication and media fields. It provided me with the safety and confidence to try, fail and grow. Additionally, and the most important, this place brought together those people whom I now call family.*



## Manizha Murodbekova

### HOW PAMIRI VOLUNTEERS IN RUSSIA AND ABROAD USED SOCIAL MEDIA TO HELP THEIR COMPATRIOTS - PAMIRI ECONOMIC MIGRANTS IN RUSSIA DURING COVID-19 PANDEMIC

#### Abstract:

This pandemic has drastically deteriorated the life of Tajik economic migrants in Russia. This research focused on studying the struggles of Pamiri labor migrants in Russia during the COVID-19 outbreak, and the role of digital media in social mobilization of Pamiri community. It specifically studies the role of social media in helping Pamiri volunteers to provide support to Pamiri economic migrants from Tajikistan in Russia during the global pandemic. Research investigates how Pamiri volunteers from Russia and Europe used social media to support their compatriots when the virus spread was in its peak. By conducting in-depth interviews with the volunteers of the Moscow and Europe-based Pamiri volunteering groups, and by analyzing the content of the social media pages of these volunteering groups on Facebook and Instagram, for the period of April – August 2020, this research explores the difficulties that Pamiri labor migrants faced during pandemic, and the initiatives that Pamiri volunteers took to help their community members to deal with

those difficulties. This study specifically aims to explore how social media was used by volunteers to help the Pamiri labor migrants to deal with the challenges brought by pandemic. The purpose of the research is to show the great role of digital media, and social media specifically, in the community mobilization of Pamiri diaspora in Russia. The project uses qualitative research methods and particularly online and in-person in-depth interviews with those volunteers as well as social media content and discourse analysis.

#### Statement:

*At UCA you constantly learn something from your peers as everyone is so unique in their own way. The diversity of personality and knowledge that each student brings to the table makes the learning process richer. My learning experience at UCA has immensely influenced the improvement of my soft skills with which I can confidently face the challenges that might come my way in future. Most importantly, UCA has taught me the value of choosing being humane every day.*



## Mubashir Ali Shah Artas

### PARTICIPATORY MEDIA PROJECT FOR SOCIAL CHANGE IN MOUNTAIN COMMUNITIES: ENGAGING THE YOUTH OF NARYN, KYRGYZSTAN

#### Abstract:

This study explores a participatory media project for social change carried out in Naryn, Kyrgyzstan. The purpose of conducting a participatory media project in Naryn is to understand the impact of participatory media on a group of young individuals. Following the participatory research methodology, the study explores how information production and dissemination can become a source of empowerment for mountain communities. The study engaged a focus group of four individuals (aged 17–21) from Naryn. The project provided an opportunity to the participants to choose a social issue that is of high concern to them. And then produce media outputs on the chosen topic to increase awareness, educate and mobilize their community members. The study is an early attempt to understand how participatory media project can change the perspective of a group regarding the power of collaboration, dialogue, and collective action and in the long term, does

the project help to raise voice and bring social change in mountain regions? The study resulted in the production of a photo voice, illustration, and a short video by the research participants. Findings of the participatory media project is summed up in a video essay by the researcher. The video essay also includes creative outputs by the participants of the participatory media project. Findings of the participatory media project have been evaluated using the DNA (diversity, network, and agency) framework.

#### Statement:

*This participatory media project has restored my faith back in the power of people and media to bring social change in society. If people of the mountain communities are given the right opportunities and skills, they can use media tools to take ownership and control of their stories by speaking up on the issues in their communities.*



## Nazira Sametayeva

### THE ROLE AND IMAGE OF KELIN IN MODERN KAZAKH FAMILIES

#### Abstract:

The topic of daughters-in-law or *kelins* [daughter-in-law] has always been an important issue in Kazakh culture and society. My paper explores the role and image of *kelin* through analysis of survey results and in-depth interviews with *kelins* of different ages, family and education backgrounds, religion and employment status. The popular Kazakh comedy film *Kelinka Sabina* is used as the basis for discussing the different aspects of *kelin*. *Kelinka Sabina* produced by Nurtas Adambay, is about a city girl named Sabina, who gets kidnapped by a man from a

village. Sabina struggles to perform the tasks and duties of a *kelin* in rural life. Although the film is comedy, it masterfully presents certain realities, both positive and negative aspects of *kelin's* life. Today, the film's first part has more than 23 million views on YouTube. The paper examines contemporary issues of Kazakh *kelins* from different perspectives and tries to identify those factors contributing to their changing role, image and relationship with their husband and parents-in-law.

#### Statement:

*UCA has shaped my personality. I am happy that the knowledge gained at UCA is not only gained through classroom lessons, but also by interacting with faculty, staff and fellow students.*



## Roza Amanbekova

THE REPRESENTATION OF GENDER ROLES IN THE SERIES  
YOU DON'T CHOOSE YOUR NEIGHBOR (2019) BY RADIK  
ESHIMOV

### Abstract:

Kyrgyz society faces a range of gender inequality issues. Stereotypes and patriarchal attitudes towards gender roles can reinforce these issues, often leading to gender-based discrimination and violence. Thus, gender stereotypes that are often linked with the traditional gender roles can limit women's potential and negatively affect their lives. Representation of gender roles in mass media, specifically, TV shows,

films, and dramas plays an important role in shaping, circulation and diffusion of these gender stereotypes and conservative gender norms. The media is also capable of challenging them. This study will examine how the popular Kyrgyz series *You Don't Choose Your Neighbor* represent gender roles. In this project, we will examine gender stereotypes and gender roles as represented in the series.

### Statement:

*UCA showed me that there is hope for a bright future and I will always carry this light of hope in my heart.*



## Shahnoza Riqamova

### ARTISTIC ACTIVISM IN TAJIKISTAN: HOW TAJIK ARTISTIC ACTIVISTS USE ART TO COMMUNICATE SOCIAL ISSUES

#### Abstract:

The study investigates the practice of artistic activism in Tajikistan, explicitly focusing on the experience and works of two activist artists. The in-depth online interviews were conducted with two artists and an art manager from Tajikistan to study the expression of activist art in the region. Content analysis of four artworks facilitates understanding the semiotics and hermeneutics of contemporary activism art, in combination with traditional Tajik elements. The analysis showed that artistic activism is a current practice in modern Tajik society regarding social change. The young population of Tajik artists has begun to use their artworks as a tool to address social issues impacting life and individuals in the country. However, the number of artists creating protest art is few because most artists prefer

to continue creating traditional art, primarily in demand. Besides, the limit on addressing any social, political, economic, and sometimes environmental issues affects the practice of artistic activism and restricts the artists. Moreover, due to the traditional values shared in Tajik society, the audience commonly critiques the activist art and does not accept it as an art object. The research extrapolates that artistic activism lacks freedom of creation in Tajikistan to generate massive social changes.

#### Statement:

*Being part of UCA for the last five years seemed like in a fairy tale forest. You never know what might be coming around the corner. But it has definitely taught me a lot!*



## Sharofat Shafieva

### THE INTERPRETATION OF THE ROLE OF WOMEN IN TURKISH TV SERIAL THE MAGNIFICENT CENTURY BY NARYN FEMALE AUDIENCE

#### Abstract:

Television, as one of the essential tools of mass media and an instrument of intercultural communication, covers those segments of the population that remain in the shadow of the influence of other media. Recently, Turkey has become a source of intercultural communication with its films and occupies one of the top places in the world in the export of TV series. Turkish TV series are becoming

very popular in Kyrgyzstan as well. This thesis aims to examine the perception of the role of women in the history of the Ottoman Empire in The Magnificent Century movie by Naryn female viewers. The analysis of data collected through focus group discussion revealed that female characters from the movie empowered Naryn's female viewers to be independent and self-reliant.

#### Statement:

*Five years of study at the University of Central Asia has been effective for my academic and personal growth. During my time spent at UCA, I have received a degree by studying with highly qualified teachers. I also learned to interact with different people in different situations and have self-confidence.*



## Sumaino Shakarbekova

### THE ROLE OF SOCIAL MEDIA IN FUNDRAISING ACTIVITIES IN NON-GOVERNMENTAL ORGANIZATIONS (NGOS) IN TAJIKISTAN

#### Abstract:

The emergence of new technology has changed communication drastically. Digital media with its new tools introduced an interactive way of communication that is being used almost in all sectors including Non-Governmental Organizations (NGOs). This research explores the role of social media as a fundraising tool in NGOs in Tajikistan. Taking an explorative approach, this branch of study investigates how NGOs in Tajikistan use social media tools and strategies in their fundraising activities. This

branch of study embraces qualitative approach, particularly semi-structured in-depth individual interviews to collect, analyze and interpret the data. This research finds that a very low percentage of NGOs in Tajikistan use social media as a fundraising tool although the majority of them have a presence on social media. This paper also highlights social media functions and content strategies NGOs perform and reveals reasons behind NGOs that do not implement social media in fundraising activities.

#### Statement:

*Throughout five years at UCA, every day has been a lesson for me to learn something new. This is the place I have met new people and made friends and connections that I will remember forever.*



## Zarastin Kholbash

ETHNIC KYRGYZ IN MURGHAB (EASTERN PAMIR, TAJIKISTAN): WHAT ARE THE FACTORS BEHIND PEACEFUL COEXISTENCE OF TWO ETHNIC GROUPS (TAJIK AND KYRGYZ) IN MURGHAB?

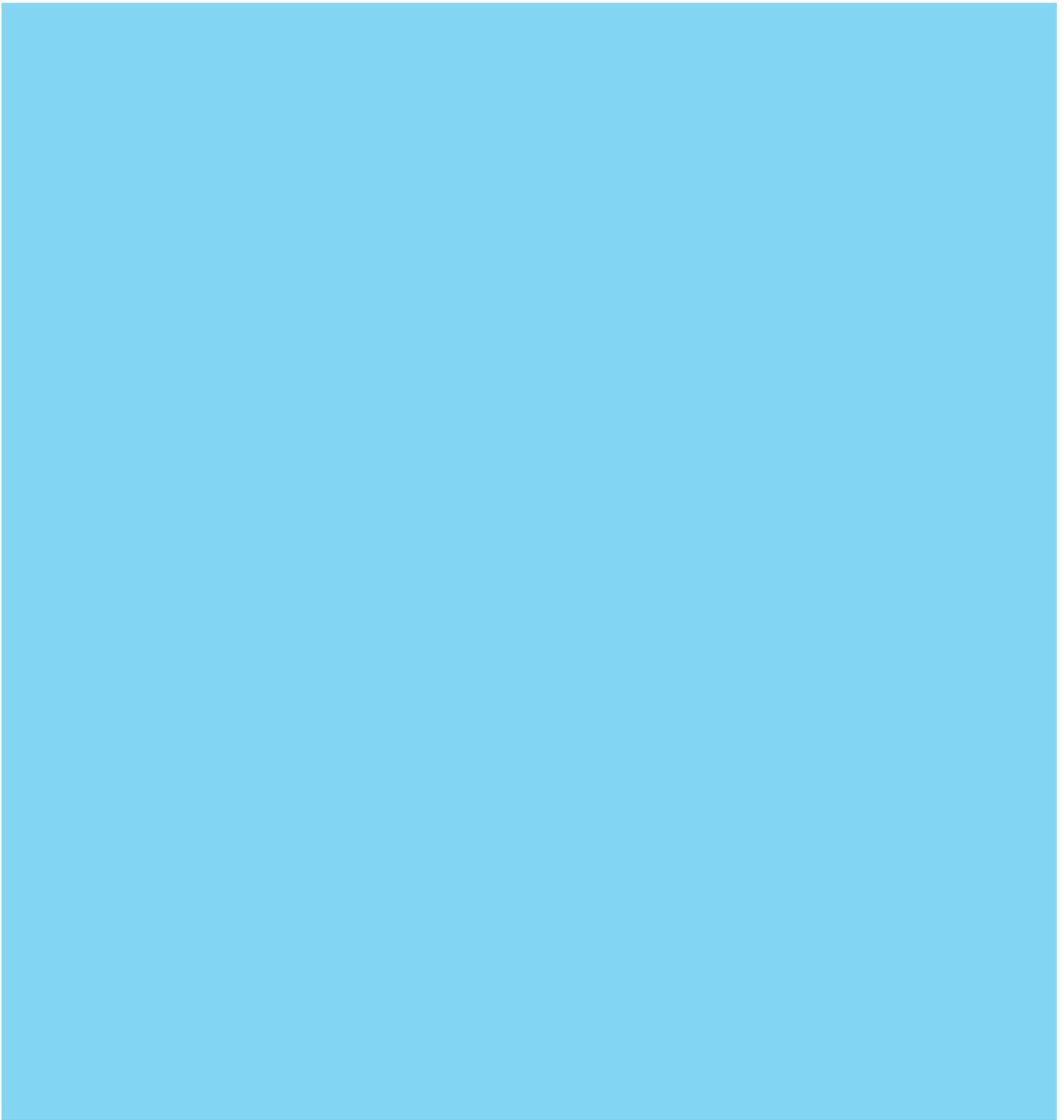
### Abstract:

Murghab is where to survive; you need to fight difficult environmental conditions. However, even these obstacles do not stop residents from maintaining the customs and traditions of their ancestors. Murghab is the region of the Gorno-Badakhshan Autonomous Region, and it is located three thousand six hundred twelve meters above sea level. Murghab is famous not only for being the highest mountain in the region. It is also the largest region of Tajikistan which takes twenty-eight percent of countries territory. Moreover, Murghab is located at the junction of borders with China and Kyrgyzstan and is populated mainly with Kyrgyz and Tajik citizens.

These two ethnic groups participate in each other's wedding and mourning events without any restrictions and outside the confines of their beliefs and national affiliation. Murghab's environment is a unique case of how two different cultures can live peacefully in one place. This research paper will explore in-depth the reasons behind this particular case of peaceful coexistence of two nations despite all cultural differences.

### Statement:

*My journey at UCA has been like a rollercoaster with its ups and downs. It has taught me how to think and that it is possible to be the change in the world.*



**24** **COMPUTER  
SCIENCE**

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## Aktan Tursunbaev

### DEVELOPMENT OF THE BACKEND REST API FOR THE AUTO CHESS MULTIPLAYER GAME WITH MULTI HISTORICAL SETTING

#### Abstract:

Auto chess is a multiplayer video game genre that is based on playing against other players by placing hero units on the battlefield efficiently so that it would lead to the winning condition. After placement is done, there is no further interaction from the user which means that the fighting stage is played automatically. Since this is an online multiplayer game, there is a need for a server that would provide the necessary functionality.

One of the purposes of the server is to have a database inside it that would store all the necessary information about the player. However, the client will need to interact with it and to deal with this necessity, the server will include an Application Programming Interface that will be retrieving from or sending to the database the information that is needed or sent by the client. Web application will be implemented using Python framework named Django together with Django REST Framework that allows extending web application to Application Programming Interface. The database is going to be relational, so the choice fell on PostgreSQL relational database management system.

Application Programming Interface is not the only thing required by the client for a working application because the playing process is done against real players online, so it also needs the server. In contrast to interaction with the database, searching for a match and the match processing cannot be built using Hypertext Transfer Protocol because it forces the client for constant requests for updates. To handle this problem, web sockets are used that allow a real time communication between client and server so that the updates are sent immediately whenever they are available.

#### Statement:

*The project is mainly based on creating REST API for the game client using web sockets. Firstly, REST API is one of the most used web interfaces in different spheres of software development. Secondly, web socket is an event driven protocol which allows making a real time communication between the client and the server to make it possible to get updates without sending new requests. The idea of the project is to show the uses of different techniques and technologies on the example of implementing the REST API for the auto-chess game.*



## Arir Allana

### VEHICLE INSURANCE MOBILE APPLICATION AUTOMATED USING MACHINE LEARNING

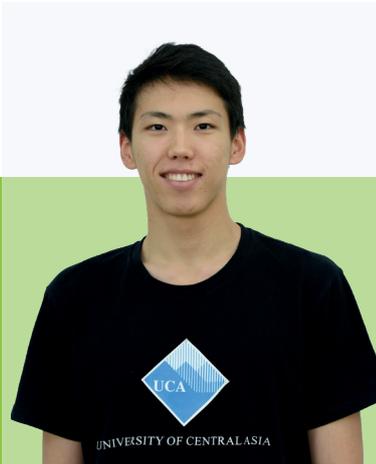
#### Abstract:

Fintech innovation makes financial services more widely available to people, lowers costs for the business and increases efficiency of transactions. The mobile application has been designed to allow clients to purchase vehicle insurance policies and file claims. The process of policy recommendation to client as well as the detection of fraud in filed claims has been augmented using machine learning models. The random forest classifier was able to detect with high accuracy if the application user filed a fraudulent claim. Additionally estimates obtained from casual model were normalized and used as multipliers to discount/markup base

premiums for policies recommended to clients. This approach has helped achieve the aim of the project which is to simplify policy purchase and claim processing for clients while providing personalized policy recommendations based on their profile. Furthermore, the inclusion of a fraud detection classifier makes it convenient for the company to quickly identify and protect itself from unethical clients. The interface of the app is easy to use and includes simple forms and decent displays.

#### Statement:

*Working on the final year project allowed me to apply programming skills and concepts learned in software engineering and data science courses.*



## Atai Cholponkulov

### GIERER-MEINHARDT MODEL: IMPLEMENTATION AND UNDERSTANDING OF TURING PATTERNS

#### Abstract:

This project studies the phenomenon of morphogenesis. In particular, visualization and modelling of this process over time – the concentration of particular quantity of chemicals (one or more) changes in space and time, i.e.: the substances are transformed into each other in local chemical reactions, and the spread out of the substances over a surface in space caused by diffusion. This can be achieved as a result of the implementation of reaction-diffusion systems using advanced simulation techniques. In this study the modified version of the Gierer-Meinhardt model, which is one of the pioneering mathematical models for the understanding of biological patterns, is used.

This project is aiming to contribute not only to the scientific community in advancing state-of-

the-art research but also to general society as a whole. The research community needs to find those areas in which it is useful. But this is a matter of broader scientific works. One of the key areas of application is in oncology. Cancer is an example of highly abnormal and pathological tissue morphogenesis. Medical Doctors could predict the growth of cancer cells using similar models as medical research is cost-effective and time-consuming as compared to simulation.

#### Statement:

*In the middle of the last century, Alan Turing proposed the theory and wrote a paper on morphogenesis which initially was not considered a breakthrough. Ironically, modern computers which originated owing to Turing's genius can prove his theory.*



## Attique Ahmed

### SIMULATION OF BIOLOGICAL PATTERNS USING GREY-SCOTT MODEL

#### Abstract:

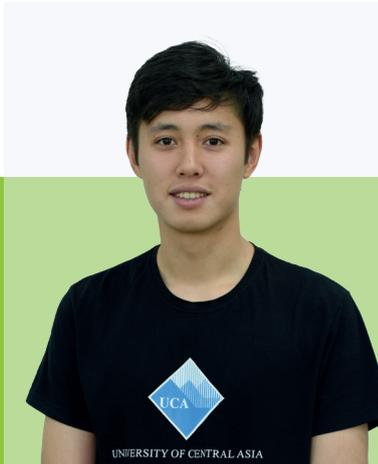
Nature exhibits a vast diversity of structures in living and non-living organisms. The shapes clouds make in the sky, how a human is developed from a single fertilized egg cell called a zygote, wind patterns formed in sand, fingerprints and many more. These patterns can be imitated by mathematical equations. The mathematical model I am going to explore to unravel the underlying mechanism involved in pattern formation is a type of Reaction-Diffusion system, called the Gray-Scott model. The reaction-diffusion system consists of partial differential equations (PDEs). It states that when chemicals react and diffuse in a space, it results in the

formation of different types of patterns in space over a time period.

I have implemented the Gray-Scott model in Python programming language to simulate various patterns consisting of spots and stripes. To achieve simulation, I approximated numerical solution via diverse temporal and spatial discretization techniques. Lastly, I will be observing the effects of range of pertinent parameters in the Gray-Scott model.

#### Statement:

*I have always been intrigued by the variety of patterns exhibited by nature. When I came to know that those patterns can be imitated by mathematical equations, I was amazed and started exploring it.*



## Eldiia Dzhunusov

### DESIGN AND IMPLEMENTATION OF THE FREELANCE PLATFORM FOR CENTRAL ASIA

#### Abstract:

The aim of the project is to improve the job finding system in the Central Asian countries. One of the proposed ways to do it is to create a freelancing platform. A freelance platform is a marketplace for businesses and freelance workers to connect and provide business experience for both sides. In this report I would like to tell the process of development of the freelance platform with the use of Spring Framework.

#### Statement:

*Developing a freelance platform was a great experience for me. It challenged me to learn new design patterns and explore the best practices of web development. The project gave me the confidence and prepared me for the real life.*



## Elena Nam

### IMPLEMENTING LOW-COST E-LIBRARY IN REMOTE AREAS

#### Abstract:

It is known that in modern society education plays one of the most important roles in the development of every country and Kyrgyzstan is not an exception. Kyrgyzstan, as a small developing Central Asian country is facing a lot of challenges in terms of providing equal access to good quality education to all the regions and remote areas. For a country with 93% of the territory covered by mountains, it is difficult to provide the population with a constant and strong internet connection. That is creating a limitation for the rural society in terms of access to educational materials. To solve this problem, we came up with the Low-Cost Digital Electronic Library System that will allow the rural communities to overcome the limitations of infrastructure. The concept of the E-library system is known and widely used around the world in many universities, cities, and villages. The final product of our project will consist of a web and mobile applications. As an open source, the service will give an opportunity to have access

to the educational materials even with a partial internet connection. By using this website, the user will be able to read books, including Russian and Foreign Literature, watch videos on the various topics and themes, and moreover, access the governmental resources from the official and reliable sources. To localize the project, the website will be presented in three languages: Russian, Kyrgyz, and English. The user-friendly interface will ensure convenient use. As a result of the project, there will be developed a runnable website and mobile application with the requested features and functions oriented toward the local communities.

#### Statement:

*During this project, I have implemented all the learned knowledge throughout my journey at UCA. This project gave me an opportunity to gain new skills and experience to implement in real life. I hope that the result of this project will help rural communities to overcome the limits of infrastructure.*



## Ismatullo Mukhamedzhanov

### DESIGN AND IMPLEMENTATION OF FRONT-END MODULE FOR INVENTORY MANAGEMENT SYSTEM BASED ON QR CODE CCANNING

#### Abstract:

Keeping track of the things, making sure everything is enough, not broken or lost is done manually, by people coming and checking every supply by themselves. It takes lots of time and effort, a big amount of paperwork. My goal is to make the process faster, more effective, and efficient. IMS (Inventory Management System) is a set of tools and software, where a person or an organization can track, maintain, and record all of the supplies throughout the entire supply chain. Automatization and digitalization of manual processes save a lot of human energy and time, making results more precise and with fewer errors. But the secret of great products is that they not only cover the needs of people and

help them to solve problems: great products as well are pleasing. All of the existing solutions of the Inventory Management System market, while being unique depending on the segment of customers they're focused on, and the sphere where the system will be applied (medical, tech, construction) have something in common - the lack of great design, intuitive design. Easy in usage product is a successfully made product - user should not face any difficulty and hitch.

#### Statement:

*It has been an irreplaceable experience of completing the final year project. It has taught me to understand the value of time. Realizing an idea can be hard work and tremendous work.*



## Jawad Haider

### A NOVEL AND EFFICIENT METHODOLOGY BASED ON BLENDED MACHINE LEARNING TECHNIQUES FOR BRAIN MRI CLASSIFICATION

#### Abstract:

In medical image analysis, brain MRI is the first step towards the early detection of brain tumor hence, saving lives, reducing the cancer burden of tremendous physical, emotional, and financial strains on individuals, families, communities, and health systems. Several methods in literature for this purpose are either computationally too complex and time consuming or both. Our proposed work provides a better solution to this

problem with high accuracy and consistency for prediction of the normal and abnormal Brain MRI images. The aim of our research was to implement as many Machine Learning models as we could and find the best performing one. The research explored six such classical models and found the Decision Tree to be successful with an accuracy of 97.4%.

#### Statement:

*My final year research has been a great adventure, where I navigated the uncharted waters of Machine Learning for obtaining new knowledge to bring sustainable solutions for health system and improve the quality of life in mountain societies.*



## Kishvar Afzunov

### SMART CONTRACT-BASED DESIGN AND IMPLEMENTATION OF A MULTICHAIN TOKEN FOR THE TESTING AND VALIDATION OF E-GOVERNANCE SERVICES

#### Abstract:

In modern society having little privacy and anonymity is a big problem as our digital traits are existing everywhere. Additionally, due to the reason that we are incorporating technology more and more into our daily life, it is becoming harder to leave fewer digital traits which you don't want to be public. However, the technological evolution towards a different direction means to be secure by controlling the data flow for which you should have a great knowledge of Computer Science to take it under your personal control. As a result, the group of people that don't have good knowledge of computers are vulnerable. There are also some possibilities of hacking server and gaining control over information and intervening in some technological procedure for subjective reasons. Blockchain is a technology that provides us with the system providing secure, private, and safe interoperability.

Considering the mentioned issues, the designed multi-chain services that consider identification based on technology of Smart Contracts is opening a way for new technology that is private, secure, and safe from interactions outside the system. The main objective of the project is to build a multi-chain token for issuing, getting, and confirming computerized credentials.

#### Statement:

*The project I am working on will be used for solving the problem with some aspects of server-based system. Specifically, E-governance services, which will solve the above-mentioned issues of centralized system by providing safer and stable system on the base of Ethereum.*



## Mehmood Yar Baig

### A DECISIVE MACHINE LEARNING ALGORITHMS BASED APPROACH FOR DETECTION OF DEEPPFAKE VIDEOS

#### Abstract:

Forgeries in visual media have always been a threat to many individual lives with damaging impacts. A single forged image can cause havoc in any situation. With the increasing advancement of Machine Learning techniques, the forgery of pictures and videos has gained remarkable precision and it has become impossible to recognize them as real or forged. A technique of deep learning manipulation on videos has created Deepfakes which are fake videos that result from swapping a victim's face onto a targeted face in a video. Circulation of such videos on the internet has put several identities in threat where anyone can pretend to be someone else and steal their identity to harm them. Considering these coercions, this project proposes a deepfake detection system that is

implemented based on deep learning algorithms. It initially trains the algorithms over publicly available datasets of fake and real videos and uses the saved trained model for classifying a user-provided video into a real or fake through a web-based interface. The algorithms have been trained and optimized to give accurate results while classifying the videos.

#### Statement:

*A deep dive into machine learning has broadened my vision of the future where the possibilities are unlimited. The human civilizations on Mars are not far if we put the efforts into using technology to build the communities without harming each other. Regardless, consistency with curiosity will always result in miracles, and thank you UCA for the staggering journey.*



## Nouman

### Ali

#### AN ENERGY-EFFICIENT SMART LIBRARY FOR REMOTE AREAS

#### Abstract:

In today's world, the resources used to generate electricity are mostly non-renewable and it leaves many negative impacts on the environment. This project proposes ways to implement a standalone photovoltaic setup for a small remote digital library. The calculation for the solar panel and the battery have been carried out such that we get a 24/7 availability of power for the devices used in the project. To

save energy and make the setup much more efficient, the DC-to-DC energy conversion is used. This has made the project independent of the electricity from the grid leaving no negative impact on the environment. To remotely control the devices Arduino ethernet shield is used along with Arduino mega and a Wi-fi router, which makes controlling the devices much easier.

#### Statement:

*During this project, I had a chance to work on the topic of my interest, and it turned out to be a great learning experience. Not being able to find the devices needed for project, and getting undesired results was the biggest challenge. However, the interest in the topic pushed me to work harder by turning my ideas to a finished project.*



## Oraz Giyoev

### USING BLOCKCHAIN AND SMART CONTRACTS FOR THE DESIGN AND IMPLEMENTATION OF A DIGITAL VOTING PLATFORM TO BE USED FOR DECENTRALISED AUTONOMOUS ORGANIZATIONS

#### Abstract:

The possibility of a blockchain-based infrastructure for a decentralized online voting platform is discussed in this paper. Compared to paper-based voting, online voting may significantly enhance the pace of calculating votes, broaden voting accessibility, and eliminate the need for voting booth attendance. Despite these benefits over a paper-based voting method, the online system is vulnerable to assaults and fraud due to its centralized nature. This research describes the overall architecture of a centralized online voting system and investigates its weaknesses. We then discuss the main concepts underpinning blockchain technology as a decentralized method capable of addressing these issues. We analyze blockchain technology's benefits and drawbacks.

The project also presents a state of the art of blockchain framework for e-voting. The illustrated implementation is suitable for small-scale elections like inside corporate houses, board rooms, etc. The implementation uses a smart contract from Ethereum. The truffle framework is used in this paper to develop, test, and deploy smart contracts. Ganache is used as an Ethereum client for testing. Here Meta-mask is used as a browser wallet.

#### Statement:

*Decentralization and blockchain have significant potential in the world of new technology. Working with blockchain was an incredible learning experience. It pushed me to go above and beyond the regular coursework and showed the importance of little incremental steps. Furthermore, the information I obtained while working on this project will help me succeed in my future job.*



## Sarvinoz Toshpulotova

### A SMART AND EFFICIENT METHODOLOGY FOR ENERGY CONSUMPTION PREDICTION IN SMART HOMES USING REGRESSION BASED MACHINE LEARNING TECHNIQUES

#### Abstract:

Energy is the most important and costly resource, and it plays a vital role in our daily life. With the passage of time, technologies are advancing, hence, the demand for energy usage is also increasing. Almost all manual work that was time-consuming in the 20th century or early 21st now can be replaced by technology. Definitely, these changes are good, they make our life much easier, but the coin has two sides, and so do these changes. Modern home appliances consume a lot of energy, which cost us a lot of money. The precise measurement

of energy consumption by home appliances for future energy management in buildings is a challenging issue due to its high impact on the human surrounding environment. The main purpose of this paper is to find an efficient method for energy consumption prediction in smart homes. The proposed technique consists of five modules, namely data acquisition, data preprocessing, prediction, performance evaluation, and application.

#### Statement:

*Considering the significant role played by energy in the contemporary world, this motivated me to make project on energy consumption in residential buildings. Moreover, the knowledge I gained while working on this project will help me to achieve success in my career path.*



## Tilek Toktorov

### DEVELOPMENT OF THE UNITY MOBILE APPLICATION FOR THE AUTO CHESS MULTIPLAYER GAME WITH MULTI HISTORICAL SETTING

#### Abstract:

In 2020, the videogame software market was valued at \$177.17 billion, and it is predicted to rise even more in the coming decade. Because of the portability, accessibility, and simplicity of mobile games, the mobile gaming market accounts for 52 percent of the global videogame market. Based on this data, it's safe to assume that mobile game creation is a very promising business right now, which is why my project partner Aktan Tursunbaev and I decided to create a mobile video game. We used the auto chess games, which have garnered a lot of popularity in recent years, as a point of reference and decided to create a game in the auto chess genre, using most of the aspects inherent in such games, such as: several player competition, grid-shaped battlefield, usage of characters divided into distinct categories that

synergize together when multiple units of the same type are present, no direct control of units by players, random component. However, in order to add freshness to the genre, we created a unique multi historical and multicultural setting that would include multiple cultures from around the world (for example, Japanese and Scandinavian cultures) and span several historical periods (for example, the Middle Ages and modern history).

#### Statement:

*This project was an interesting experience that for sure will help me in my work as a game developer, as I have no former experience with multiplayer.*



## Valeriya Nikiforova

### SMART AND DIGITAL LIBRARY FOR RURAL COMMUNITIES

#### Abstract:

Even though education plays an important role in today's world, there are still some remote regions where people face restrictions in accessing educational platforms due to poor internet connection. Therefore, the main goal of the project is to help rural communities to overcome internet speed limits by creating a free e-library that will give access to educational books, videos, and government websites stored on a local server. The main advantage of the platform is that it will download required materials to the local server and will update it constantly, so later people can access up-to-date materials at high speed. At the same time, we are going to decrease the cost of the library, by running the project on Raspberry Pi, which is cheaper than a regular server. Therefore, in order to successfully run the project, people

need only Raspberry Pi and a local network, which is used to share the materials with users connected to this network. When a person is connected to the local network, materials can be accessed through a website or a mobile application. To sum up, this project is meant to become a modern and low-cost solution for the problem of remoteness and limitations in remote regions by providing them with education and information resources.

#### Statement:

*I hope that the work done to realize the idea of the final year project will help rural communities overcome internet speed limitations.*



## Yasir Nawaz

### AUTOMATIC NUMBER PLATE RECOGNITION SYSTEM

#### Abstract:

With the rapid development of our society, the number of vehicles is increasing every day. To monitor the increased number of vehicles on the road, automatic license plate detection has been deployed in vast regions all over the world. Traditionally, this system uses optical character recognition or OCR to identify the license plates. Despite the system's broad usage, it tends to perform best in ideal situations. In a harsh environment, where there is a lot of noise or blur in the acquired images, the system's

ability to recognize number plates diminishes significantly. Character recognition tends to be the toughest challenge for this License Plate Detection System. To tackle this issue this project proposes a new system which utilizes image preprocessing algorithms to detect the number plate. Then we segment the characters and use Convolutional Neural Network (CNN) to recognize these characters through feature extraction.

#### Statement:

*Working on my final year project has been a great learning experience. It pushed me to explore fields that I had not considered before.*

**42** EARTH AND  
ENVIRONMENTAL  
SCIENCES

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## Aiza Kuzovenko

### THE ASPECT EFFECT ON LANDSLIDES OCCURRENCES IN PAMIR AND TIEN SHAN

#### Abstract:

Landslides are at the top of the list of the most damaging hazards in Central Asia, bringing huge losses to facilities and settlements. Unfortunately, hazard risk assessment is not well-funded in Central Asian countries; the status of risk mitigation investments and catastrophe risk financing needs improvement or remains under construction. This paper investigates the effects of slope aspect on landslide initiation in two regions of Central Asia: Pamirs and Tien-

Shan using available geospatial methods. Both areas represent arid or semi-arid regions, and vegetation varies on different slope aspects at both sites. Using satellite imagery and available geospatial software, the correlation between existing landslides, vegetation and aspect indices is identified, which then can simplify landslide assessments in high elevation dry regions, where vegetation varies with slope aspect.

#### Statement:

*I am very thankful to every faculty member for sharing their knowledge and providing endless support throughout these five years. Each course taken has contributed to my skills enhancement, which helped with the final research project.*



## Alidovar Sodatsairov

### COMPARATIVE ANALYSIS OF SCIENTIFIC AND TRADITIONAL KNOWLEDGE ON *P. HARMALA* USES: AN EXAMPLE FROM ISHKASHIM DISTRICT, GBAO, TAJIKISTAN

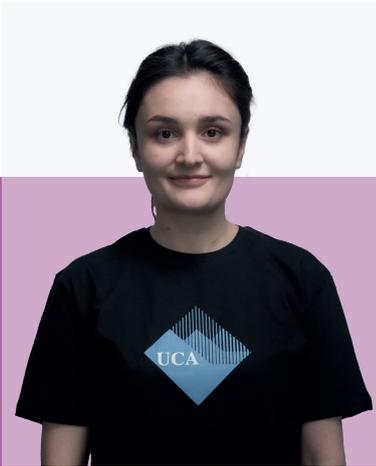
#### Abstract:

The research focuses on the traditional medicinal use of *Peganum harmala* in local areas of Ishkashim district of Badakhshan province of Tajikistan. It makes visible the significance of traditional knowledge of local people in 11 villages of Ishkashim district. This study uses a qualitative approach by using semi-structured interviews. Twenty-seven interviews were conducted with people ranging ages from 35 to 85. Study focuses on traditional use and preparation methods of *Peganum harmala*. The findings were classified into 30 categories, with

a total of 277 variety of medical and spiritual/religious applications. The findings revealed that the smoke of whole plant has the highest benefit for various diseases which is followed by seeds. The top four categories of usage explained by 100% (n=27) of the interviewees were cold and flu remedies (used to help colds), cough medicine (used to get rid of coughs), dermatological aid (against skin issues), and protection (evil eye and supernatural forces).

#### Statement:

While working on my senior diploma thesis, I became more familiar with the ethnobotanical research and became aware of the importance of traditional knowledge in rural communities. The documentation and preservation of traditional knowledge became a crucial part of my life which will continue in the future.



## Hangoma Kokulova

### URBAN LANDSLIDES: CASE STUDY OF KHOROG

#### Abstract:

Landslides are common in GBAO of Tajikistan and in Khorog. Studying the areas susceptible to landslide will help to mitigate their risks. The main objective of this study is to outline the triggering factors of landslides and define the optimal solutions for improved urban planning in the study area. At the first stage, landslide locations were identified by receiving the shapefiles from geological department of Aga Khan Agency of Habitat. A 12.5 m resolution Digital Elevation Model was downloaded and then factors contributing to landslide initiation (e.g., slope gradient, slope aspect, elevation, lithology and geology) were extracted from the spatial

analysis database of ArcMap. Furthermore, the relationships between landslides and geologic, topographic, and environmental factors was defined. NDVI was downloaded from USGS to define the relation between vegetation and landslides. Finally, the optimal solution and recommendations are presented for disaster risk management and reduction. Consequently, this study serves as a guide for landslide prevention and for future land planning in Khorog.

#### Statement:

*What we learn with pleasure, we never forget.*



## Intizor Silmonov

### MINERALOGY OF TALC FROM THE MULVOJ MINE IN ISHKASHIM, GBAO, WESTERN PAMIR MOUNTAINS

#### Abstract:

Talc is crystallized in the metamorphic carbonate rocks of the southwest of Pamir mountains in the Mulvoj area of Ishkashim. Field studies show that talc is restricted to carbonate layers and petrography reveals calcite, tremolite, quartz and dolomite as other minerals. XRD studies show that talc sample is almost pure talc and geochemistry of the samples shows very low content of harmful elements such as heavy metals and radioactive minerals in the studied samples. Main mineral reactions for

talc formation were reaction between dolomite, quartz and water and the main reaction for tremolite formation was talc, calcite reaction. Considering the previous mining activities and removal of the main ore body and regarding the lack of suitable road and infrastructures and location of the mine at the elevation of ~800m from the village, it seems that mining operation in the Mulvoj area is not economically justified for time being.

#### Statement:

*At UCA, I have gained a lot of knowledge leading to positive change in my life.*



## Khizer Zakir

### QUANTIFYING CONTEMPORARY AND FUTURE RISKS OF THE NATURALLY DAMMED LAKE RIVAKKUL USING GEOINFORMATICS TECHNIQUE AND MORPHOMETRIC INDICES

#### Abstract:

Pamir mountains are considered as a natural laboratory that offers a wide range of opportunities for researchers and scientists to understand the dynamics of the earth processes. The unprecedented global climate changes have threatened these high mountain communities as it intensifies the melting of glaciers and the glacier-related hazards. Glacial lake outburst flood (GLOF) is one of the most catastrophic glacial hazards of the high mountain regions of Pamir. These sudden catastrophic events release a high volume of water and debris at a high velocity that poses an extreme threat to lives, properties, and infrastructure downstream. Lake Rivakkul is one of the high-altitude glacial lakes in the Pamir mountains that has been listed under the high hazard category by Mergili & Schneider (2011). This study aims to understand the impacts of morphometric, climatic, and topographic characteristics of the surrounding catchment

on the outburst flood of the lake. It also tries to quantify the contemporary and future risks from the lake outburst flood using the geoinformatics techniques. Remote sensing and GIS technology has made this investigation more efficient as it provides great potential for mapping and monitoring of the remote glacial lakes in the alpine regions. The findings of this research indicate the high flood susceptibility of the catchment. This study can be used as a preliminary hazard assessment approach by local communities and the outburst flood risk management to develop improved awareness and mitigation strategies against devastating hazards, such as GLOFs.

#### Statement:

*I feel accomplished and victorious, because this was not just a thesis, but the translation of everything we have learned during our 5 years at UCA. A complete package of hard work, dedication, and knowledge.*



## Khudonazar Imomyorbekov

### ASSESSING MULTIDIMENSIONAL ENERGY POVERTY IN BARKHOROG DISTRICT OF KHOROG TOWN, TAJIKISTAN

#### **Abstract:**

The multidimensional energy poverty index (MEPI) was applied to assess energy poverty at the level of households in the Barkhorog district of Khorog town in GBAO, Tajikistan. The MEPI was applied to the dataset derived from the household interviews (n=42). Using the standard framework, the results demonstrated no energy poverty (MEPI=0.009) across the district. Adjusting the indicators and weights and implementing, this new index to the Barkhorog dataset demonstrated higher results (MEPI=0.27, 0.33, and 0.34), showing moderate energy poverty. Moreover, the energy consumption was examined based on the income of the

households to understand the exact standings of the households in multidimensional energy poverty. Consequently, the Barkhorog dataset likely understates the true degree of energy poverty, while data from household income reveals levels of energy poverty that are significantly higher and more accurate. These findings provide regulators and researchers with significant information for investigating the true level of energy poverty and exploring solutions to this problem. We make suggestions for future research on how to measure energy poverty, with a focus on the design of studies and the choice of indicators.



## Mamadnazar Mamadnazarov

### STUDY OF SERPENTINITES FROM THE DARVAZ AREA

#### Abstract:

Serpentinites in the Darvaz area are exposed as elongated slivers among the crustal metamorphic rocks, mainly garnet-biotite schist and gneiss. They appear as green to grey shiny rocks in the field. Optical studies show that the main mineral phases, as result of serpentinization of the original peridotite in the rocks are antigorite polymorph, while chrysotile is restricted to the veins, indicator of water infiltration rule in their formation. Chlinoclore, magnesite and secondary opaque minerals are other products of serpentinization due to metamorphism/alteration. Original mineral phases in the rocks, remaining from the protolith peridotites include

subordinate clinopyroxene and spinel (chromite). All other primary minerals (e.g. olivine and orthopyroxene) are changed to serpentine. Whole rock geochemical studies reveal high MgO and low FeO and Al<sub>2</sub>O<sub>3</sub> contents for the studied samples, indicative of oceanic mantle source for the original peridotites. Geochemical feature for the Darvaz serpentinites shows that their protolith peridotites were formed in a fore arc tectonic setting during evolution and subduction of the Palaeodepths oceanic crust within the Rushan-Pshart ophiolitic zone of the Southern Pamir Mountains.



## Mavzuna Azizova

### CLIMATE CHANGE IMPACT ON WHEAT PRODUCTION IN THE KHATLON REGION, TAJIKISTAN

#### Abstract:

Wheat is an important crop in every Central Asian country. The market for products made from cereal is expanding, and to meet the demand, sustainable agricultural management is required. The timing and productivity of wheat production are both susceptible to being impacted by several factors, one of which being climate change. This research was conducted in the Khatlon region of Tajikistan to evaluate the effect of the hydro-meteorological factors such as temperature, precipitation, and evapotranspiration on the productivity of wheat. The study employed a variety of methodologies to establish a connection between the hydro-

meteorological factors and the amount of wheat produced. The statistical analysis of the annual temperature and evapotranspiration records versus the wheat yield, revealed a direct relationship between the three variables. The production of wheat is increased both by higher temperatures and by higher rates of evapotranspiration. However, the precipitation analyses did not show any correlation. The limitations of the study were stated, and relevant recommendation were suggested.

#### Statement:

*The work on my diploma thesis has helped me to learn how to work independently. It was a period when I had to use all the skills and knowledge obtained over four years. Even if it was a small-scale research, it has built base for further enhancement in academia. I am grateful for all the faculty members who have contributed to my studies.*



## Payrav Dehqonov

### ASSESSING THE EFFICIENCY AND EFFECTIVENESS OF SOLAR ENERGY INSTALLATION IN MURGHAB DISTRICT OF GBAO, TAJIKISTAN

#### Abstract:

Renewable energy has become an important factor in Tajikistan's energy sector to provide sustainable development in the energy sector. Since most of the people in remote areas of Tajikistan are facing a lack of electricity, the PE company in GBAO has constructed a solar system funded by USAID. The paper aims to evaluate the pilot project of a solar energy system in Murghab district through examining its energy efficiency and effectiveness. This will be essential for the feasibility of deploying solar energy to satisfy electricity demand in Murghab district. The research uses quantitative and qualitative analysis. The quantitative method has a secondary source provided by PE company to examine the electricity production and compare it with the initial system parameters of SPP. The qualitative analysis has primary sources from interviews that were conducted in the study area. The result shows that the annual contribution of

SPP to electricity production is 8.9% of the total energy generation. Compared to actual electricity production, the SPP produced half of the capacity suggested by PE, which meets the international standards. From the interview questionnaire, the research finds out that people use coal, teresken, and animal dung during the wintertime to heat their houses, and the rest of the year they use electricity produced by SPP and HPP. Most of the residents have observed the changes in electricity production since the SPP installation. At the end, there were some recommendations related to the expansion of the system.

#### Statement:

*Working on the senior project has enabled me to put my theoretical skills into practice and dive deep into challenges, allowing me to get real-world experience.*



## Shahina Aqdodova

### THE IMPACTS OF TEMPERATURE AND PRECIPITATION ON THE GUNT RIVER DISCHARGE

#### Abstract:

Understanding hydrological processes is often extremely challenging in the mountainous regions, however, it is crucially important for water allocation and hazard management. The quantitative approach applied in this study was used to understand the relations between temperature, precipitation and river discharge. More specifically, simple and multilinear regression and statistical models were built using both ground-based and remote-sensed data. The results indicate an increase in mean temperature values by  $-0.15 \frac{^{\circ}\text{C}}{\text{year}}$ , a decrease in mean precipitation values by approximately

$0.25 \frac{\text{mm}}{\text{year}}$  and a decrease in discharge by approximately  $-1.6 \frac{\text{m}^3}{\text{year}}$  from 2000 to 2020. The various regression models show that temperature has the highest impact on the discharge value and has a moderate negative correlation with it. This relation might be explained by the increase in the evapotranspiration rates as temperature rises. The impacts of precipitation are also very high. It has been observed that warmer season precipitations have a higher positive relation with discharge than the colder season precipitations.

#### Statement:

*I enjoyed working on my thesis project not only because I learned but also for all the happy and beautiful moments with my friends.*



## Safarmamad Gulmamadov

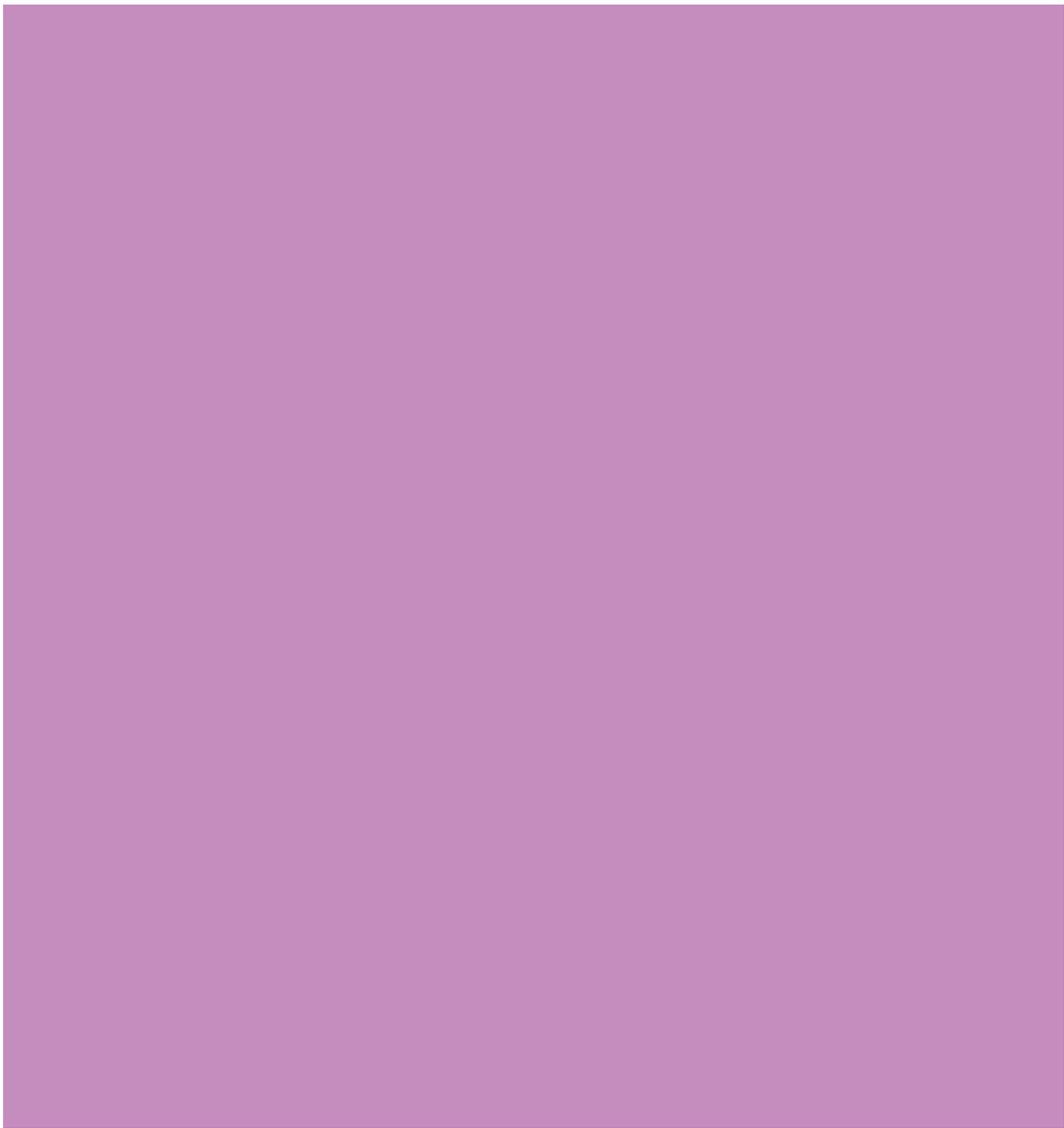
### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF SEBZOR HYDROPOWER PLANT

#### Abstract:

This study aimed to evaluate the ESIA conducted by Pamir Energy Company in 2019 on the construction of the Sebzor Hydropower Plant in accordance with the World Bank standards and compare/contrast the relevant parts of ESIA with the actual current situation on the ground, including responses of residents around the construction site and other stakeholders, as well as personal observations of the researcher. This study only focused on the environmental and social impacts of Sebzor HPP on the premises of the construction site around the villages of Barjingal and Dasht. To effectively implement this study, qualitative type of research was chosen where project documentations were thoroughly examined first and then semi-structured interviews with those involved in the construction of the Sebzor HPP and local residents were conducted. Another effective data collection method used during this research was observation. The above-mentioned tools and methods enabled this study to identify some of the positive and negative impacts of the project on the locals and their surroundings based on the combined analysis of the ESIA report, World Bank standards, interviews and personal observation. The detected issues during the study related to health issues; gardening and cattle breeding; lack of awareness about the mitigation measures that are planned to be implemented after completion of the HPP construction; unfair distribution of land compensation among the affected residents and cause of damage to the properties of the local residents. At the end, this research provides important recommendations for the improvement of the work of Pamir Energy company with the Sebzor HPP project according to the World Bank standards and the feedback received from the local residents.

#### Statement:

*Working on this research topic had been a journey worth embarking on. It gave me an insight into the current realities of people's lives being affected by the changing environmental and social circumstances. This has been such a unique opportunity. Not only I was able to conduct actual research by applying the knowledge acquired throughout my studies at UCA but also my respondents – people who I interacted with, taught me invaluable lessons through sharing their knowledge and priceless experience.*



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ECONOMICS

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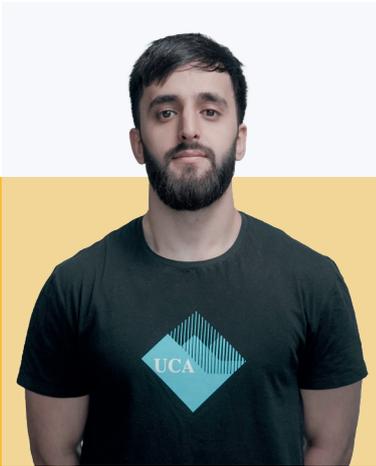
## Aidai Maksatbekova

### THE ROLE OF GENDER IN ASSESSING FINANCE BY SMES IN CENTRAL ASIA

#### Abstract:

Entrepreneurship and small and medium-sized enterprises (SMEs) have received global recognition for their contribution to economic growth by driving innovation, generating income, and providing job opportunities. However, despite their popularity and significant role in economic development, most entrepreneurial activities remain the domain of men. Women entrepreneurs face a number of challenges starting and running SMEs. Different social norms, discriminatory laws, limited access to finance and lack of education prevent women from engaging and succeeding in entrepreneurial activities. This study considers the role of finance as a limiting factor for promoting women owned SMEs in

Central Asia. Using the World Bank's Enterprise Survey (WBES), several regressions methods analyze the relationship between the gender of the owner and the obstacles in accessing finance by SMEs in Central Asia. The results for the pooled sample show that women ownership is positively and significantly correlated with obstacles to accessing finance by SMEs in the region. Furthermore, the separate country-level analysis demonstrates that women ownership is statistically significant only for Kyrgyzstan—a result that is robust to alternative specifications. To improve access to finance for women-owned SMEs in Central Asian countries, the study considers various policy options.



## Boqir Sabzaliev

### FOSTERING AGRICULTURAL PRODUCTIVITY THROUGH AGRICULTURAL INVESTMENTS: THE CASE OF KYRGYZSTAN

#### Abstract:

In low- and middle-income nations, low agricultural and rural growth is often attributed to limited investments on productivity enhancing inputs. This study investigates the impact of modern inputs such as pesticides, herbicides, and insecticides on agricultural productivity in Kyrgyzstan, as well as the contribution of savings and credit on farm investments. The Life in Kyrgyzstan surveys (2016 and 2019 rounds) were used to extract data on key parameters needed to assess the impact of investments

on crop productivity in Kyrgyzstan. Estimation methods employed were OLS regression and Pooled OLS regression. Results of the regression analysis suggest that the most influential factors of agricultural productivity are increase in plot size, increase in personal investments, and type of seeds used. The data indicate that availability to (mainly informal) loans and any type of investments has a positive effect on fertilizer use, and in turn, fertilizer use has a positive effect on yield.



## Butabek Butabekov

### MARKERS OF SUCCESSFUL AND UNSUCCESSFUL ENTREPRENEURS OF KHOROG

#### **Abstract:**

Khorog is a remote town in Tajikistan which has been facing challenging problems of unemployment for many years. Most families in the region are able to survive because of remittances from relatives working in the Russian Federation. The war in Ukraine and the subsequent fall of the Russian currency combined with declining economic growth in Russia have exacerbated an already difficult situation. Given this predicament, it is suggested that relying on remittances entails many risks for the region and that alternative paths of development need to be studied. It is in this context that the present

study investigates how the growth of small businesses can be supported to create jobs in the city. Specifically, the research focuses on what markers separate successful entrepreneurs from unsuccessful entrepreneurs. The research is based on the collection of qualitative data consisting in 21 interviews of entrepreneurs in Khorog. Over the course of the study seven differentiating factors have been identified out of which six were determined to play a vital role in shaping our understanding of what contributes to entrepreneurial success in Khorog.



## Dad Ali Shah Aziz

### THE IMPACT OF REMITTANCES ON THE WELL-BEING OF AFGHAN REFUGEES IN TAJKISTAN

#### **Abstract:**

This paper investigates the impact of remittances on the well-being of Afghan refugees in Tajikistan, who are among the most remittance-dependent people in the world. Using primary data collected from interviews with Afghan refugees in Vahdat City and a Multivariate Logistic Regression model, the study finds that remittances play a significant role in the well-being of Afghan

refugees. The remittance effect, however, is not as large as it is for employment—suggesting that refugees well-being is improved if they are self-sufficient and employed. Additionally, the well-being of Afghan refugees is directly affected by how much national or international aid they get and how often they send money home.



## Faheem Ashraf

### AN EMPIRICAL TEST OF THE CAPM MODEL USING PAKISTAN STOCK EXCHANGE DATA

#### Abstract:

Despite being one of the important investment tools in the capital markets, Capital Asset Pricing Model (CAPM)'s validity and applicability is still debated by economists. In fact, many researchers and investment professionals consider it dead, while others continue to see its relevance. This study is an empirical validity test of CAPM using data from the Pakistan Stock Exchange (PSX). Specifically, daily returns for the period of 2011 to 2021 and weekly data return data for the period of 2004 to 2021 are used to examine whether CAPM can be used to price

assets in emerging economies particularly in Pakistan. According to CAPM, alpha (a measure of relative market return) should be equal to zero and there should be linear relation between expected returns and beta (a measure of relative risk). This study finds that alpha is significantly non-zero suggesting that the market risk is not the only risk, which an investor has to bear. There is non-systematic risk, which is significant. Although we found close to linear relationship between expected return and beta, the overall findings do not support the validity of CAPM.



## Farhad Ahmady

### THE RELATIONSHIP BETWEEN ICT AVAILABILITY IN RURAL AREAS AND AGRICULTURE GROWTH IN CENTRAL ASIAN COUNTRIES

#### **Abstract:**

The use of ICT has rapidly increased in recent decades globally, attracting a lot of focus on its impact on socio-economic sectors. Many studies have tried to analyze the link between ICT and economic growth. Although the research on this topic is mixed, the majority of the studies have associated the availability of ICT indicators like cellular phones, fixed lines, and the internet with growth in the economic sector. The impact of ICT in developed countries is reported to be stronger compared to developing countries. This paper aims to examine the relationship between ICT availability in rural areas and the agriculture growth rate in five Central Asian countries. The study applies time series analysis using

data on cellular mobile subscription and the percentage of internet users as independent variables and the agriculture growth rate as the dependent variable over the period of 2000 – 2020. The empirical results show a positive and significant link between cellular mobile subscriptions in rural areas and growth in the agriculture sector. However, the results do not find enough evidence to suggest a positive relationship between the use of the internet in rural areas and agriculture growth. However, the use of mobile phones helps farmers in rural areas improve their productivity, easily access the market, and increase their profit.



## Fariza Khosabekova

### THE ECONOMIC IMPACT OF THE KYRGYZSTAN- TAJIKISTAN BORDER CLOSURE

#### Abstract:

In 2021, Kyrgyzstan implemented a trade ban on imports and exports from Tajikistan and a complete border closure with this state. In this paper we quantify the effect of this trade ban on prices, welfare, demand for goods, tax revenues, and overall imports and exports of both Kyrgyzstan and Tajikistan. We conduct a simulation using Global Trade Analysis Project (GTAP). The results of our simulation show that the trade ban causes the market prices to

decrease in Tajikistan while mostly increase in Kyrgyzstan. The welfare of Tajikistan falls by 8.584 \$US millions yet increase by 1.735 \$US millions in Kyrgyzstan. Wages fall in Tajikistan and rise insignificantly for Kyrgyzstan, except for the case of natural resources sector where it rises for Tajikistan but falls for Kyrgyzstan. Tax revenues fall for Tajikistan and insignificantly rise for Kyrgyzstan.

#### Statement:

*Writing my thesis has been challenging, yet a very exceptional experience. One of the most important things I learned is that seeking help and asking for feedback from others is the key to a successful project.*



## Gulshan Mastonova

### THE PROSPECTS FOR GM COTTON IN CENTRAL ASIA

#### **Abstract:**

In the last few decades, the production and yield of cotton harvest has increased dramatically in many countries due to the adoption of Bt technology. Bt cotton was introduced commercially in 1996 in the United States and was rapidly adopted, and has been adopted in a number of cotton producing regions. The adoption of Bt cotton has had a big positive impact on the economy, environment, health and income of farmers. The technology is regarded as environmentally friendly solution to the

problems with pest infestation, and has led to a decline in the use of chemical pesticides during all phases of cotton cultivation. However, the four Central Asian cotton-growing countries – Uzbekistan, Kyrgyz Republic, Turkmenistan and Tajikistan have not adopted Bt cotton. This study analyses the various reasons for the non – adoption and suggest that weak regulatory and biosafety rules rather than low demand are the main reason why Bt cotton has not been commercialized in Central Asia.



## Khairullah Bahram

### WILL MEGA CITIES DRIVE FUTURE ECONOMIC GROWTH? A CROSS COUNTRY ANALYSIS

#### Abstract:

This study analyses the correlation between population growth, investment as a share of GDP, Government expenditure as a share of GDP, intentional homicide, gross government debt, inflation percent change, city population and tertiary school enrollment, and GDP growth and GDP per capita of the 44 developing countries over the period of 1950 - 2020. The paper aims to show how the largest city in the country is contributing for the GDP per capita and GDP growth of the country. This study uses fixed effect estimator regression to analyze the relation between the population growth and GDP per capita and GDP growth. The finding shows

that population growth, intentional homicide rate, and inflation has negative relation with GDP growth and per capita GDP. Government gross debt and government expenditure shows a positive relationship with GDP per capita while it has negative relation with GDP growth. Secondly, city share, and tertiary school enrollment have positive relation with both GDP growth and GDP per capita. The results show that as the cities get bigger it will have a negative relation with the growth of country. But educated population along with investment in cities is the key to economic growth of the developing countries.



## Laylo Sherzamonova

### HEALTH AND ECONOMIC GROWTH IN THE COMMONWEALTH OF INDEPENDENT STATES

#### Abstract:

This paper explores the role of human capital in the form of health on the economic growth of the Commonwealth of Independent States (CIS) countries. Previous literature indicates that human capital in the form of health has constant positive impact on the economic growth of a country and its contribution is high. To test whether this is the case for the CIS countries, the Solow Growth Model is used to study the relationship between health and economic growth. Data on economic growth, factor inputs and health are used to disaggregate the growth rate of each factor of economic growth (output, capital, TFP, & human capital) via an augmented Cobb-Douglas function for each of the last three

decades. The results suggest that for the case of CIS countries since the 1990's, there is inverse relationship between health and economic growth, although there is considerable variation among the countries. The countries with negative output per worker growth rates are Moldova and Ukraine ranging from - 7% (Moldova) to - 1% (Ukraine). The health contribution is negative for Ukraine (- 74%) which is lower than Moldova (- 46%). Turkmenistan and Uzbekistan have the same and the highest among the CIS countries output growth rate of 0.04%. However, the health contribution differs tremendously; Turkmenistan (59.7%) and Uzbekistan (7%).



## Mahtob Gulayozova

### THE EFFECTIVENESS OF COMMUNITY-BASED HEALTH FINANCING IN SECURING HEALTH CARE COST

#### Abstract:

Developing country citizens often do not have access to health insurance and require financial assistance to cover their medical costs. In 2009, the Aga Khan Health Service introduced Community Based Health Financing (CBHF) to help people, particularly in rural regions, fund their healthcare expenses. Its goal is to expand healthcare access while removing financial constraints that households face. However, little is known about the impacts that the CBHF programme is having on the participants in GBAO. In this study, the relationship between being a CBHF member and hospitalization, needing hospitalization but not receiving it, and medical visits were analyzed using regression analysis

and primary data collected through a survey of 204 respondents in Rushan, Roshtqala, and Khorog. The data was analyzed using Multivariate Logistic Regression and Poisson regression. Out-of-pocket costs of having CBHF is found to be 22.3% of total medical expenses while those that don't it is 63.4%. The results reveal that CBHF Membership and Hospitalization have a positive relationship, specifically, In comparison to non-members, CBHF members are 23.5% more likely to be hospitalized. Since CBHF has a positive effect on people's ability to pay for the healthcare services they need, it is recommended that it be expanded to new locations.



## Malika Mirzoshoeva

### THE IMPACT OF OUT-MIGRATION ON AGRICULTURAL PRODUCTION IN KYRGYZSTAN, EVIDENCE FROM LIK-2019

#### Abstract:

This research was conducted to examine the connection between agriculture and migration in Kyrgyzstan. Agriculture contributes to Kyrgyzstan's food security and accounts for a significant portion of the country's income. This sector is a significant source of income for the poor, whether they own their own farm or work as agricultural wage workers. In order to examine the impact of migration on agricultural productivity, this study focuses on crop production in Kyrgyzstan in order to examine

the possible link between these factors. The paper conducts an econometric analysis using the fifth wave of the Life in Kyrgyzstan survey (2019). The findings indicate that in Kyrgyzstan, out-migration of household members has a favorable effect on agricultural output. Other variables, such as family size, enrolment in primary technical and university education, field size, and the usage of manure/compost and insecticides, also have a substantial influence on agricultural production.



## Manuchehr Shamsiddinov

### HUMAN CAPITAL AND GROWTH IN CENTRAL ASIA

#### Abstract:

This paper analyses the economies of five Central Asian countries by decomposing the economic growth of the nations during the period between 1990 and 2019. The growth accounting technique is used to find the growth rate of human capital in the forms of education and health and its contribution to the growth rate of real GDP per worker. It was estimated that the growth rates of real GDP per worker and human capital in the form of health were negative during the first decade for all countries, but they grew during the subsequent years. On

the other hand, the growth rate of the indicator of education was positive throughout the period of analysis. Thus, it was estimated that the contributions of human capital to economic growth amounted to 43.8%, 48.4%, and 43.6% for Kazakhstan, Uzbekistan, and Turkmenistan. On the other hand, it was equal to -497% and -128% for Kyrgyzstan and Tajikistan, indicating that despite positive growths of human capital, they were not sufficient to offset the negative growth rates of output per worker.

#### Statement:

*Overall, my experience has been quite positive at UCA since I have learned a lot. Partially, this is due to the fact that I had a lot of free time most of which I spent on studying. I would say that the preparatory year was the most productive for me.*



## Mavzuna Shobekova

### THE EFFECT OF HUMAN CAPITAL IN THE FORM OF EDUCATION ON ECONOMIC GROWTH IN POST-SOVIET COUNTRIES

#### Abstract:

This paper provides a quantitative and qualitative investigation of the impact of human capital, specifically education, on economic growth in the former Soviet states between 1990 and 2019. In doing this study, the report examines existing research on the topic. In addition, it clarifies the types of data and statistical sources utilized for the quantitative analysis and calculations on the contribution of education to the well-being of eight post-Soviet countries, including the Russian Federation, Ukraine, Latvia, Lithuania, Armenia, Tajikistan, Kyrgyz Republic, and Kazakhstan. In addition, this research

provides a comprehensive explanation of the computation methods. In the end, the report finds that education is a very important aspect that contributes to the economic progress of every country, and in this case, to the economies of the former Soviet states; however, the influence is long-term. Therefore, nations must invest in the education of their citizens. The expansion is gradual but rapid. Therefore, in order to contribute more to growth, countries should devote greater resources to education improvement.



## Mohru Mardonova

### IS WATER INSECURITY ASSOCIATED WITH FOOD INSECURITY? EVIDENCE FROM MURGHAB, TAJIKISTAN

#### Abstract:

Water is essential for human existence in many aspects of life, from drinking to cultivating and preparing food. This study identifies the association of water insecurity and food insecurity. Using the Household Water Insecurity Scale Experience (HWISE) index, water accessibility, reliability, adequacy, and security are measured for the Murgab district. Primary data from 70 randomly selected households is used for identifying the association between food and water insecurity. The study finds that 58% of the respondents are extreme water insecure. For measuring food insecurity, the Household

Food Insecurity Access Scale was applied and the results reveal that 27% of the household in the sample are mildly food insecure and 52% are severely food insecure. Using Ordered Probit the study finds that there is a link between water insecurity and food insecurity, and that an increase in water insecurity results in families moving into the next category of food insecurity. The results of the study suggest that special attention should be given to water management and improving water storing facilities, as that in turn would improve household food security.



## Murtazo Navruzshoev

### THE IMPACT OF REMITTANCES ON ECONOMIC GROWTH: THE CASE OF CENTRAL ASIA

#### Abstract:

The objective of this paper is to conduct an empirical analysis using a panel data set to examine the impact of remittances on economic development in the Central Asian republics over the period 1990 to 2020. The most important conclusion to be drawn from this study is that migrant movements do not directly contribute to the expansion of output in Central Asian countries. To establish if remittances have a positive or negative effect on economic development, various economic growth theories are reviewed from which testable hypothesis

are formulated. The empirical model employed is a panel regression with fixed effects., using data on remittances, real GDP per capita, gross fixed capital creation, and human capital. Since the study consists of a panel of countries, the fixed-effects method investigates how geographic location, natural resources, and level of development differ across Central Asian republics. The research discovered a negative and statistically significant association between remittances and economic development in the area.



## Nadim Oshurbekov

### THE PAST, PRESENT AND FUTURE OF TAJIK-UZBEK TRADE RELATIONS

#### Abstract:

This research paper attempts to explore Tajikistan-Uzbekistan trade relations and potential using gravity model of trade. The trade between these countries plays a key role in the economy of each country. So, for the further procedure the data for the period of 1990–2019 across the world was collected. After doing the regression all the coefficients that were found are then used to predict the overall trade potential between countries, specifically between Tajikistan and Uzbekistan. The findings that were produced from the regression model expose that trade potential between Tajikistan and Uzbekistan is high. Also, the trade potential of each country is high with the Central Asian countries and some countries that are close to them. From the gravity model of the trade, we know that if the countries that are close to each other or share borders between each other the volume of trade is going to be higher than other countries that

are far from them. Furthermore, Tajikistan and Uzbekistan should discover new ways or new strategies to improve their trade relation with the countries that they have trade with. The volume of trade between Tajikistan and Uzbekistan was so low in the past, the main obstacle for that can be the political and diplomatic issues. The same obstacles occur in the case of some other Central Asian Countries, where Uzbekistan and Tajikistan trade is adversely affected by the political or any other problems.

#### Statement:

*UCA has been a journey where I learned and gained skills from studies and internships related to my field of study. The process shaped me to be more active, social, team player and hard worker in my daily life. Extracurricular activities, sports and an opportunity to do community service made us a part of the community and to get involved in many activities other than only academics.*



## Sultonmamad Chorshanbiev

### HOW COVID-19 INFLUENCED RESTAURANT BUSINESSES IN TAJIKISTAN: A CASE STUDY FROM KHOROG

#### **Abstract:**

The purpose of this study is to analyse the impacts of Covid-19 on restaurant businesses in Khorog, by collecting data from Khorog city located in Gorno Badakhshan Autonomous Oblast (GBAO), Tajikistan. The study is based on primary data collected through a qualitative method by developing a questionnaire and conducting survey interviews with participants including managers of restaurants, restaurant owners and employees. Participants were selected through a purposeful sampling method which is a non-random sampling technique to select relevant, right, and information-rich participants who had the experience of working in the restaurant sector for more than five years. The results indicated that the impacts of

Covid-19 on restaurant businesses in Khorog were less negative as compared to those cases which were discussed in the literature review from various parts of the world. Almost 90% of the respondents said that they didn't close their operations during the spread of Covid-19. This was due to the flexible and not very strict attitude from the government side which lead to no lockdowns in the region. Overall, the study indicated the less negative impacts of Covid-19 on restaurant businesses in Khorog and also showed that nearly 80% of the participants of the survey were satisfied with their revenues, but they didn't provide the exact figures, during the pandemic which they were expected to decline significantly.



## Taghoisho Meralishoev

### TAX RATE AS AN OBSTACLE FOR SMALL AND MEDIUM ENTERPRISES IN TAJIKISTAN

#### Abstract:

The aim of this study was to understand the obstacles faced by small and medium enterprises (SMEs) in Tajikistan, specifically the role of taxation. Using data from the World Bank's Enterprise Survey various factors were considered in the regression analysis, such as age of firm, ownership structure, sales, relative cost of production, as well as the number of employees. The dependent is a binary variable as to whether firms regard tax as an obstacle.

Using a logistic regression model, it is found that number of employees and sales is negatively associated with firm's that regard tax rate as an obstacle. This suggests that for smaller firms, tax is bigger obstacle than larger and likely constrains their growth. A policy implication of this result is to lower taxes or simplify tax collection for new firms as they lack the experience and expertise to handling tax issues.



## Yosamin Maramova

### THE COMPARISON OF FREE ECONOMICS ZONES IN TAJIKISTAN AND THE FACTORS BEHIND THEIR FAILURE AND SUCCESS

#### Abstract:

A free economic zone is an area of land with no tax charges. Tajikistan has five free economic zones (FEZs) in various parts of the country, many of them functioning since 2010. This study aims to identify the drivers and barriers to the successful implementation of FEZs in Tajikistan. Quantitative and qualitative primary data are used to find out the gaps in the work of FEZs. The research investigates FEZ Sughd and FEZ Ishkoshim as they are examples of what might be regarded as “successful” and “failing” FEZs respectively. Based on primary interviews and review of government documents, it is

found that the main factors of FEZs success for as geographical location, availability of infrastructure, investment, easy registration steps, job places and localization of FEZ. Although, Ishkoshim FEZ does not have these characteristics, a new branch of FEZ Ishkoshim, called FEZ Tem is planned to be built in Khorog region to incentivize production in center and later move Ishkoshim region and continue developing its FEZ as well. Lastly, the paper gives recommendations for the future development of free economic zones Ishkoshim.



## Yosumin Qurbonbekova

LAND SUPPLY ELASTICITY: GOVERNMENT LAND REGULATIONS AND HOUSING SUPPLY IN THE REMOTE GORNO-BADAKHSHAN AUTONOMOUS OBLAST

### Abstract:

The elasticity of land supply quantifies the extent to which the amount of land under development will change in response to a change in land price. In Tajikistan, as in many other countries, government regulations restrict the buying and selling of land by private parties, and as a result as land cannot be transacted. In the absence of a market for land, transactions in the housing market where structures are bundled together with land are used to approximate the land supply elasticity in GBAO, Tajikistan. Data from the Tax Department, as well as the Land Centre in Khorog on housing stock, land supply regulation, land allocation regulation, and land use regulation was used in the analysis. Additionally, physical geography constraints were estimated using data from a

GIS Digital Elevation Model (DEM) and analyzed for the years 2001 to 2020. The findings suggest that out of five variables, only land allocation regulation has a statistically significant impact on land supply throughout GBAO as well as at the individual district levels, increasing log house price by 88%. Physical geography constraints are significant in all regions other than Murghob. Specific attention should be directed to allocating more money for industrial funding in Murghob, decreasing it in Shughnon, and keeping the current practice in the rest of the districts. This may increase the employment in these locations and the diversify their economic activities. Moreover, raising awareness of proper land use is important for the efficient management of land.



## Zaher Shah Sayedi

### LOCAL ECONOMIC DEVELOPMENT IN BADAKHSHAN TAJIKISTAN: A CASE STUDY OF THE YAK BUSINESS IN MURGHAB AND ROSHTQALA

#### Abstract:

The study aims to provide insights into the yak sector (yak herding and production of derived products) in the Murghab and Javshangoz districts and explore to what extent people in these districts are economically dependent on this trade. The research provides a review of the yak herders' living conditions, changes in the population of yaks, prices of the live animals and by-products, fluctuation of demand for such products and other relevant factors affecting the industry. The study also highlights how local herders produce, store, and use yak products and whether they are using traditional methods of production or have access to modern tools and equipment. The research aims to fill a gap in

the literature since to our knowledge there is no published research on this topic in the specific region under study. The project concludes with a review of some policy options aiming at improving the sustainability and growth of the sector with the aim of improving the livelihood of people concerned.

#### Statement:

*UCA, a place where we did not only receive education but gained knowledge. My learning experience at UCA has been satisfactory, and it was mainly something that I expected. One thing that I liked the most about UCA is its quality of education with internationally recognized standards.*

