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Political Economy of Education Research (PEER) Network, Central Asia Hub held a two-day “Research Outputs and Dissemination Workshop” and a Dissemination Day on the “Political Economy of Education in Central Asia: Insights from the Field” in Tashkent, Uzbekistan, from 13 to 15 March 2023.

[PEER Network](#), a three-year-multinational research collaboration funded by the Global Challenges Research Fund (GCRF), aiming to develop a critical and locally grounded approach to the Political Economy Analysis of Education and promote equity and social justice, commissioned [11 Central Asian early career researchers in summer 2022](#) to conduct small-scale research. Approaching the end of their research, the events were held to prepare the fellows for dissemination and share their findings with a wider audience. For this opportunity, ten fellows across Central Asia, including Kazakhstan, Uzbekistan, and Tajikistan, and project members from Nazarbayev University and one of our partner universities, the University of Ulster (UK), participated in the events.

RESEARCH OUTPUTS AND DISSEMINATION WORKSHOP, 13-14 MARCH 2023



PEER Network, as an initiative to support local early career researchers and encourage local epistemological approaches and educational debates, and the fellows’ research approaching an end, the workshop focused on how to disseminate their research findings to different audiences. During the workshop, a range of advice on several forms of publications and presentations was given by the Central Asian Hub’s Principal Investigator (PI), Professor Naureen Durrani (Graduate School of Education, Nazarbayev University), Associate Professor H el ene Thibault (Central Asian Hub’s co-PI, School of Sciences and Humanities, Nazarbayev University), Professor Kelsey Shanks (Network’s joint PI, School of Education, Ulster University), and Professor Karl O’Connor (School of Social Work and Social Policy, Ulster University). Throughout the workshop, the speakers shared practical

and reflective guidance on how to prepare a book chapter and journal paper, including issues around research originality, significance, and rigour.



Furthermore, a step-by-step exercise on research dissemination presentation was organised, in which the fellows were invited to create a dissemination plan, including the objective, key message, audience, and format, and delivered mock dissemination presentations. The presentations were then followed by individual writing sessions preparing for their publications and dissemination presentations for the following day. Vibrant scholarly exchanges continued during the breaks discussing their research and dissemination.



DISSEMINATION DAY, THE POLITICAL ECONOMY OF EDUCATION IN CENTRAL ASIA: INSIGHTS FROM THE FIELD, 15 MARCH 2023

Following the workshop, a Dissemination Day was held with the corporation of the Institute for Advanced International Studies under the University of World Economy and Diplomacy in Tashkent to share the fellows' research findings with a wider audience. The event brought local and international scholars and practitioners together to support the development of critical views to address various inequalities in Central Asia.

The Vice-Rector of the University, Dr Gulnoza Ismailova, opened the event with her welcoming notes, expressing the importance of research and scholarly collaboration for advancing quality and equity in the education sector in Central Asia. The fellows applied the Political Economy Analysis (PEA) of Education in their research. PEA allows us to explore the interrelationship between the distribution of power and recourses among different social and cultural groups and how inequalities and violence are produced and sustained. Fellows applied PEA tools to their research topics, covering issues related to Throughout the presentations, the complexities of the Central Asian contexts, such as post-Soviet legacies, nation-building processes, national identity construction, multi-ethnicity, multilingualism, globalisation, and the balance between secularism and Islam, were highlighted.



RELIGION AND EDUCATION IN UZBEKISTAN

The relationship between religion and education was explored through the question of national identity and gender equity in the context of Uzbekistan.



Our fellow from Uzbekistan, Dr. Zilola Khalilova (Post-Doctoral researcher, Beruni Institute of Oriental Studies Academy of Sciences Uzbekistan), presented *“Religion and Education in Contemporary Uzbekistan: A Construction of the Religious Self between ‘The Moral’ and ‘The National’ in School Textbooks”*. Her research explored religious discourses present in a range of school textbooks and analysed the place of religion in the state and its relation to the processes of post-independent Uzbekistani national identity construction.



Our fellow from Uzbekistan, Rahimjon Abdugafurov (Research Associate, Candler School of Theology; Senior Fellow, the Center for the Study of Law and Religion, Emory University; Director, the Vatandosh Institute for Central Asian Research, Vatandosh Connect), presented *“Islam, Women, and Higher Education in Uzbekistan”*. His research examined the depiction of women in Islamic discourses in Uzbekistan and their influence on women’s participation in higher education and professional orientations.

GENDER EQUITY IN KAZAKHSTAN

Gender representation and equity in Kazakhstan were analysed through diverse dimensions, such as the Science, Technology, Engineering, and Mathematics (STEM) environment, school textbooks, and medium of instruction.



Our fellow from Kazakhstan, Ainur Almukhambetova (Instructor, Graduate School of Education, Nazarbayev University), presented *“Exploring STEM Teacher Educators’ Understanding of Gender-Responsive Pedagogies in Kazakhstan”*. Her research explored gender awareness and understanding of gender responsiveness, and gender-responsive pedagogical skills among STEM teacher educators in teacher training universities in Kazakhstan.



Our fellow from Kazakhstan, Zhazira Bekzhanova (Teacher-Researcher, Department of Foreign Philology and Translation Studies, Aktobe Regional University named after K. Zhubanov), presented *“Gender, Language and Social Inequalities in the Textbooks in the History of Kazakhstan”*. Through the analysis of the visual and textual discourses on gender in the textbooks in both Kazakh and Russian, her research explored the enactment and representation of gender and hence examined gender inequalities through multiple dimensions.



Our fellow from Kazakhstan, Alexandra Nam (Research Assistant, Graduate School of Education, Nazarbayev University), presented *“Medium of Instruction, National Identity and Attitudes towards Gender Roles”*. Her research explored the intersections of the language of instruction, national identities, and attitudes toward gender roles in Kazakhstan. She hence compared discourses on national identities, including gender, in Kazakh and Russian medium schools.

COLONIAL AND POST-COLONIAL LEGACIES

Questions around national identity and internationalisation of education were analysed through the Soviet and post-Soviet aspects.



Our fellow from Uzbekistan, Sherzod Khaydarov (PhD student, School of Education and Sport, The University of Edinburg) presented “*A Political Economy Analysis of Factors Influencing the Expansion of Russian International Branch Campuses in Uzbekistan*”. His research examined the political backgrounds and processes of the establishment of Russian international branches in Uzbekistan and the perspectives of local stakeholders on the expansion of Russian international branch campuses. He further analysed if the proposed agendas and rationales of the branches have been achieved.



Our fellow from Kazakhstan, Diana Toimbek (Director of the School of creative industries, Astana IT University), presented “*The Political Economy of Soviet Education in 1920-1930 and its Implications for National Identity*”. In her research, she conducted an archive analysis and examined the Soviet educational policies and discourses in relation to nation-building, particularly through the dimension of the construction of Soviet and Kazakh national identities.

INCLUSIVENESS: ACCESS TO EDUCATION AND LABOUR MARKET

Various aspects of inclusiveness, such as access to education and labour market were researched in relation to language, disability, and beyond.



Our fellow from Kazakhstan, Fariza Tolesh (Associate Professor, Department of Social Sciences, Astana IT University), presented “*The Politics of Languages in Education: Issues of Access to Education and Labour Market Participation of Minority Ethnic Groups in Kazakhstan: The Case of Uzbeks*”. The research investigated the influence of different language policies and reforms on the educational and economic situations of minority groups, particularly those of ethnic Uzbeks since 1991.



Our fellow from Tajikistan, Vasila Bozichaeva (Junior researcher, Sociology Department, Institute of Philosophy, Political Science and Law named after A. Bahovaddinov, National Academy of Sciences of Tajikistan), presented “*Equity-Minded Assessment from the Perceptions of University Stakeholders in Tajikistan*”. Her research analysed the experiences of language minorities and students with disabilities on the assessment policies in higher education. She explored the inclusivity and equity of assessment tools and methods.



Our fellow from Kazakhstan, Dr. Aigerim Mussabalinova (Independent researcher, Kazakhstan), presented “*The Right to Education of Children Affected by Nuclear Tests in the Semipalatinsk Region, Kazakhstan (1991-2021)*”. Her research explored the impacts of nuclear tests in the Semipalatinsk region on children, particularly focusing on the rights to education of the children affected by the tests. The research further examined the current educational conditions in relation to the special educational needs of those children.

The insightful and thought-provoking presentations were then followed by engaging and vibrant discussions between the presenters and the audience.





Graduate School of Business News

THE GENDER FORUM ON MARCH 29



The Gender Forum coordinated by the Consortium of Gender Scholars took place on March 29. The event «[ESD—A Vaccine Against Violence in Kazakhstan](#)» was the final stage in the implementation of the project «*Tools to Promote Gender Equality and Women’s Empowerment to Combat Gender Violence in Kazakhstan*» by the Empowerment Self Defense (ESD) Global with the support of the US Diplomatic Mission in Kazakhstan.

Since September, 142 female students have been taught physical and verbal self-defense strategies, setting and defending personal boundaries, and recognizing the degree of danger. «One of the missions of our university is not to leave all ideas and developments only inside the campus, but to give them development. Therefore, we are very proud that the project has found development in the regions of Kazakhstan, with the ESD Central Asia Public Foundation being formed as part of the trainings,» said the GSB Vice Dean and co-founder of the Consortium of Gender Scholars (GenCon) Prof. Jennifer Lewis. In total, from October to February, about 2,500 people of different ages were trained in Kazakhstan.

At the moment, work is underway to transfer the methodology to an online format, namely through the development of its own application called «My Power».

AWARDS



GSB's Professors Dr. A. Onajomo Akemu and Dr. Atanu Rakshit have won the **2022 EFMD Case Writing Competition**. Their [case study about the BI-Group construction company in Kazakhstan](#) focuses on the company's search for new market segments abroad.

The European Foundation for Management Development (EFMD) is Europe's largest network association in the field of management development, it has over 890 member organizations from academia, business, public service and consultancy in more than 88 countries (www.efmdglobal.org).

EVENTS

On February 23, Nazarbayev University Graduate School of Business organized the Open House Day to provide information about Master's & PhD degree programs and the admissions process at NUGSB. GSB's Associate Professor Dr. A. Onajomo Akemu was speaking on the topic of "Intrinsic motivation".



On April 6, there was a guest lecture by NURCE's Ayan Birimzhan on the topic of "How to Attract Investments". Ayan owns a network of healthy food canteens and coffee houses named "Health Project" with a turnover of \$1 million per year, manages a team of 55 employees, and has thousands of customers throughout Kazakhstan.

On May 24, NUGSB together with Fuqua School of Business at Duke University will host a one-day **Symposium on Marketing and Economics** that will showcase research done by GSB and Fuqua faculty. The papers in this symposium expose different methodological approaches, ranging from analytical to empirical methods, and explore a diverse set of topics in the fields of Marketing and Economics. The symposium will consist of 30-minute presentations by GSB and Fuqua faculty.



RESEARCH SEMINARS

April 12: Tom Vinaimont (NUGSB) “Efficient Y-indices for Regressions with an Application of Covid’s Impact on Stock-market Liquidity», Finance

March 29: Dauletzhan Baimukhanov (NURCE/L.N. Gumilyov Eurasian National University) “Learning Mechanisms in Technology Business Accelerators in the Context of a Nascent Ecosystem”, Entrepreneurship

March 24: Aigerim Yergabulova (NUGSB) “War in Ukraine: Impact on Firm Entry and Employment in Kazakhstan”, Economics

March 15: Atanu Rakshit (NUGSB) “Putting Down Roots: Entrepreneurial Resource Search Under Uncertainty”, Entrepreneurship

March 3: Jonathan Berkovitch (LUISS Guido Carli University) “The Information Content of Firm Operational Efficiency”, Accounting

March 1: Andrey Tkachenko (NUSSH Economics) “Competitive Effects of Vertical Integration in Auctions, Economics

February 22: Symbat Moldabekova (Suleyman Demirel U.) “Technology Investment Decision-Making: Case Studies of the Implementation of Contactless and QR Payments in Commercial Banks of Kazakhstan”, Management

January 18: Francesco Rocciolo (Imperial College London) “Pricing Climate Change Ambiguity”, Finance

BUSINESS DIGEST

1. [“How and to what extent is current entrepreneurship policy gendered in Kazakhstan?”](#) by Nurlykhan Aljanova.
2. [“The influence of entrepreneurship education \(EE\) Policy on women’s entrepreneurial activity in Kazakhstan”](#) by Shumaila Yousafzai.
3. [“Entrepreneurship policies of Central Asian countries: The case of Kazakhstan and Uzbekistan”](#) by Yelena Muzykina.
4. [“Entrepreneurship—a tool for decolonization”](#) by Shumaila Yousafzai, Nurlykhan Aljanova, and Wojdan Omran
5. [“Institutional support for women entrepreneurs at local level: Kazakhstan’s case”](#) by Nurlyaiym Zhaksybayeva
6. [“The role of Universities in a Quintuple helix model to develop circular entrepreneurial ecosystems”](#) prepared by Shumaila Yousafzai.
7. [“Gaslighting and its impacts on the career progress and wellbeing of female academics”](#) by Shumaila Yousafzai.

PUBLICATIONS AND WORKING PAPERS

- Dr. Jozef Konings has the paper published in De Economist (joint with Gert Bijnens and Shyngys Karimov). The title of the paper is «Does Automatic Wage Indexation Destroy Jobs? A Machine Learning Approach».
- Dr. Chandra Pathki has a paper accepted in the Journal of Organizational Behavior, which is an A* journal on the ABDC list with an impact factor of 8.17. The title of the paper is «An Uncertainty Management Perspective on the Antecedents of Leader Self-Serving Behavior».
- Dr. Jiyang Dong has a paper accepted in the Journal of International Business Studies, which is an FT-50 journal with an impact factor of 11.38. The title of the paper is «Regulatory Institutional Misalignment and Cross-Border Acquisitions: Evidence from an Emerging-Market Country» (joint with Guoli Chen, Jinshuai Hu, and Feida Zhang).
- Dr. Gabriele Lattanzio has a paper accepted in the Journal of Financial Markets, which is an A* journal in the ABCD list. The title of the paper is «Dissecting the Listing Gap: Mergers, Private Equity, or Regulation?»
- Dr. Gabriele Lattanzio has a paper accepted in the Journal of Applied Corporate Finance, which is an academic journal aimed at publishing papers expected to have a significant impact on the industry. The title of the paper is «The Rise of Growth Equity Funds» (joint with Lubo Litov and Bill Megginson).
- Dr. Thierry Post has a paper accepted in Management Science (FT 50 and 5-year IF 7.77). The title of the paper is «Ordering Arbitrage Portfolios and Finding Arbitrage Opportunities».
- Dr. David DeRemer has a paper accepted in the Journal of Economic Behavior & Organization, which is an A* journal (Australian's ABCD Deans list). The title of the paper is «Mountains of Evidence: The Effects of Abnormal Air Pollution on Crime» (joint with Birzhan Batkeyev, KBTU).
- Dr. Jozef Konings has a working paper in NBER (joint with Mary Amiti, Cédric Duprez, and John Van Reenen). The title of the paper is “FDI and Superstar Spillovers: Evidence from Firm-to-Firm Transactions».
- Dr. Aigerim Yergabulova has a NUGSB working paper (joint with Dinara Alpysbayeva and Galiya Sagyndykova). The title of the paper: “Foreign-Owned Firms and Occupational Gender Pay Inequality”.

PRESENTATIONS

- Dr. Jozef Konings presented «Estimating Optimal Inflation Target from Trends in Relative Prices» at NBK conference on strategic issues of monetary policy on 25 April in Almaty.



NURCE.KZ

ABOUT US

The Nazarbayev University's Research Centre for Entrepreneurship (NURCE) is a research centre within the Graduate School of Business (GSB) at Nazarbayev University (NU). NURCE aspires to become a leading centre of research excellence in the field of entrepreneurship.

OBJECTIVES AND VALUES

NURCE strives to develop strong external connections with regional, national and international enterprise research in universities, economic development, business and other networks. Our journey to achieve these objectives is guided by the following values:

- Integrity — We maintain the highest ethical standards in conducting and publishing our research.
- Curiosity — We encourage intellectual curiosity.
- Collaboration — We promote interdisciplinary collaboration.
- Capacity — We aim to enhance the productive capacity of our members, students, and promote social value through the centre activities.

PROJECTS:

- *Towards a gender-aware entrepreneurial ecosystem for women's entrepreneurship: A study of Kazakhstan's and Kyrgyzstan's community-based tourism sector (2022- 2024).* This project is supported by Faculty Development Grant from Nazarbayev University Grant No. 11022021FD2913.
- *When Failure is not the End: Entrepreneurial Restart within Kazakhstan's Technology Landscape (2022-2024).* This project is supported by the Faculty Development Grant from Nazarbayev University Grant No. 11022021FD2922.
- *Value creation within Kazakhstan's Entrepreneurial Ecosystem: Towards an Understanding of Informal and Formal Entrepreneurs (2022-2024).* This project is supported by the Collaborative Research Grant from Nazarbayev University Grant No. 11022021CRP1510
- *Mapping the Entrepreneurial Ecosystem (EES) for Women Entrepreneurs of Kazakhstan (2022-2024).* This project is supported by the Ministry of Eductaion Grant, Government of Kazakhstan, Grant No. IRN AP14871324.

BOOK ON WOMEN ENTREPRENEURS

COMMUNITY BASED TOURISM

CBT is an entrepreneurial activity in the tourism sector that is owned and administered by the local community. In the last two decades, CBT has developed into a mechanism for facilitating sustainable and socially inclusive tourism activities in many developing and transition economies, including Kyrgyzstan. In 1995, the first Kyrgyz CBT was initiated in Kochkor village by a Swiss organisation called Helvetas through a women's promotion project as a way to motivate women in rural Kyrgyzstan to engage in entrepreneurship by starting their own projects.



The Kyrgyz CBT model, with a sustainable approach, has successfully generated economic livelihoods and reduced rural poverty, while also protecting the local environment and nomadic culture, and providing an alternative income and employment for local communities. In 2003, local CBT groups formed the Kyrgyz CBT Association (KCBTA) with the aim of assisting its members with marketing and training services and representing their interests at the national level. Since then, the innovative CBT business model in Kyrgyzstan has provided knowledge and skills training in local communities and has reached out to potential customers and tour operators through marketing campaigns and building trust. Today, there are eighteen other CBT offices located throughout Kyrgyzstan working towards their mission to contribute to the local economic development.



As part of the Faculty Development Grant from Nazarbayev University: *Kazakhstan's and Kyrgyzstan's community-based tourism sector*, the first research output is the book called *Together we have it all Women Entrepreneurs in the Community Based Tourism Sector of Kyrgyzstan (CBT)*. This book presents a collection of 18 narratives that the team members of NURCE produced based on the data collected during their trip to Kyrgyzstan on the summer of 2022, where they interviewed 18 women entrepreneurs.

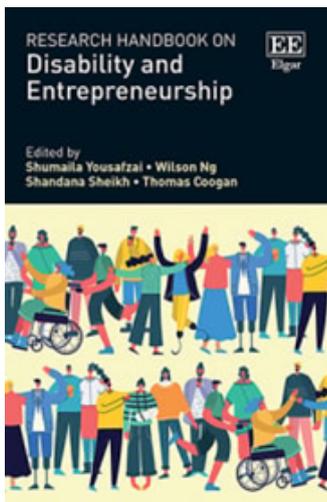
As part of these interviews, bringing forward the message that CBT not only encourages a deeper connection between the host and visitor, but it also promotes the empowerment of women, cultural conservation, social responsibility, and the enhancement of livelihoods.

On March 20, 2023, CBT Arslanbob Book hosted a presentation. The team conducted the presentation and photo exhibition of the book, dedicated to developing women's entrepreneurship and economic empowerment of women. The exhibition and book presentation took place in four cities across Kyrgyzstan and Kazakhstan, including Issyk-Kul, Arslan-bob, Kochkor (18.03.2023) and Almaty. At these events, visitors were able to see portraits and read narratives about our women in CBT.





On April 7, the Associate Professor of Entrepreneurship at the Nazarbayev University Graduate School of Business [Shumaila Yousafzai presented the book in Astana](#). The NURCE team also had the honor of meeting the Ambassador of Kyrgyzstan to discuss potential areas of cooperation for the launch of the book. On April 5, NURCE conducted its first research methods workshop, sharing its experience of narrative approach in qualitative research methods.



[New Research Handbook on Disability and Entrepreneurship edited by Prof. Shumaila Yousafzai et al.](#)

By exploring the economic and social value of disabled people with positive entrepreneurial traits and adaptive skills, this innovative book breaks away from normative entrepreneurial studies to recognize the overlooked value in disabled entrepreneurs. Chapters explore disabled entrepreneurs from non-Western economies and marginalized social segments, with a focus on emphasizing the importance of disabled women entrepreneurs from developing economies as agents of change for society and the economy.

UZBEKISTAN TRIP SUMMARY



As part of CRP grant, our team traveled to Tashkent, Samarkand, Shakhrisabz, Gijduan, Bukhara, Khiva and Ferghana Valley in Uzbekistan. 31 narratives were collected with a focus on how entrepreneurs were using their businesses to revive their identity and culture.

In recent years, there has been a growing interest in decolonisation efforts globally. This has led to increased discussion of the role of entrepreneurship in facilitating this process. While there is no one-size-fits-all approach to decolonisation, entrepreneurship can be a powerful tool for communities seeking to

assert their autonomy and break free from the effects of colonialism. Through this research, we aim to explore some of the ways in which entrepreneurship can be used for decolonisation and consider the potential implications for academics and practitioners working in this area.

All the detailed information on NURCE research activities can be found in their monthly newsletter that is available via this [link](#).



Graduate School of Public Policy News

CHANGING WELL-BEING IN CENTRAL ASIA: EVIDENCE FROM KAZAKHSTAN AND KYRGYZSTAN



Dina Sharipova, Assistant Professor, Graduate School of Public Policy, Nazarbayev University, Astana, Kazakhstan, dina.sharipova@nu.edu.kz

Alma Kudabayeva, Assistant Professor, Department of Economics, KIMEP University, CERGE-EI Teaching Fellow, Almaty, Kazakhstan, a.almak@kimep.kz

«Changing Well-Being in Central Asia: Evidence from Kazakhstan and Kyrgyzstan,» Journal of Happiness Studies (2023): 1-28.

This article explains the puzzle why life satisfaction (subjective well-being) declined in Kazakhstan and increased in Kyrgyzstan from 2011 to 2018. Using data from World Value Survey (waves 6 and 7), we examined the predictors of the change in well-being in two Central Asian states.

The well-being of the population is important for a sustainable development of any country. The quality of human capital defines many positive outcomes, including economic growth and development, promotion of democratic values, and a healthier and longer life. Although scholars looked at the determinants of well-being, they have not explained what factors predict the change in well-being in Central Asia. In this article, we explained why Kazakhstan and Kyrgyzstan have different trends and what factors predict that change (rise or decline) in subjective well-being.

We found that freedom of choice and financial satisfaction are powerful factors that predict the change in SWB in the two states. In Kazakhstan, during this period (2011-2018) people experienced a decline in freedom of choice and decrease in terms of control over their lives due to the economic crisis, devaluation of tenge and political instability. This has negatively predicted their satisfaction with life. In contrast, in Kyrgyzstan, freedom of choice has increased the gap of SWB thereby contributing to better well-being of the population. In other words, those people who feel that they have a choice and control over their lives are more satisfied. This is an interesting finding since previous research has mostly focused on freedom of choice in democratically affluent societies rather than in developing or poor states (Inglehart et al., 2008). To improve their well-being, people should have more freedom of choice in their lives.

Another factor, financial satisfaction, has positively predicted the difference in subjective well-being between 2011 and 2018. Those people who could improve their financial status feel more satisfied than those who did not. Previous research has also shown that financial satisfaction might lead to better well-being since people feel more secure than those who are not financially satisfied.

In addition, we observed that subjective well-being changed differently for various social groups. In Kazakhstan SWB increased for financially satisfied people and it diminished for the financially dissatisfied people. In Kyrgyzstan, for both groups we observed the increase in life satisfaction. These results showed that even within one state the change in SWB might vary from one group to another. As such, scholars should disaggregate various factors to understand a more nuanced dynamics of life satisfaction over time. In addition, the differences in economic and political contexts are important.

One of the important findings of this study is the difference in terms of life satisfaction across financially satisfied and dissatisfied groups. We have observed that from 2011 to 2018, SWB decreased for the financially dissatisfied and increased for the financially satisfied population in Kazakhstan. In contrast, in Kyrgyzstan, we found that both groups have experienced better well-being. It could be explained by the relative economic growth in the country during this period and more political rights and freedoms for people. During this period, more people were involved in political activities, including the elections of presidents. Thus, it could contribute to a higher level of satisfaction in life. In Kazakhstan, the same period was characterized by the worsening of people's rights and liberties although the country experienced a moderate economic growth rates compared to the period of 2000-2008 economic boom.

This disaggregated analysis shows that the decline in well-being is not a universal trend for the entire population of Kazakhstan. Rather, it might vary from one group to another. A uniform approach glosses over important nuances that might exist on the ground. Hence, it is important to disentangle various factors to have a better understanding of change in life satisfaction in various contexts.

Other factors that contribute to life satisfaction in Kazakhstan include university level education and social participation, while good health, tolerance to other people and part-time employment improve well being in Kyrgyzstan.

Thus, the governments of Central Asia should pay more attention to better education and provide more freedoms to people in order to improve their well-being. At the same time, people also should engage more in public life since higher levels of social participation improves their well-being. In addition, citizens of Central Asia should be aware of their level of tolerance towards other people. As such, the government and people should aim to construct a liberal and inclusive society to improve their lives.

The article can be found [here](#).

References:

Inglehart, R., Foa, R., Peterson, C., & Welzel, C. (2008). Development, freedom, and rising happiness: global perspective (1981–2007). *Perspectives on psychological science*, 3(4), 264–285., <https://doi.org/10.1111/j.1745-6924.2008.00078.x>



School of Medicine

News

MAY IS NURSING MONTH! SPOTLIGHT ON NUSOM NURSE SCIENTISTS

May 12 is International Nurses Day... the anniversary of the birthday of Florence Nightingale (12 May 1820 - 13 August 1910), an English statistician and the founder of modern nursing. Some countries such as the USA recognize the entire month of May as “Nurses Month”. We would like to take this opportunity to recognize the Nurse Scientists of NUSOM!

Nurse + scientist are two words rarely put together. However, nurse scientists have some of the most important roles and professions in advancing health and evidence-based science and practice across all populations.

A nurse scientist is a nurse with advanced preparation such as a PhD or DScN (Doctor of Science in Nursing) in nursing or related fields including research principles and methodology who are content experts with knowledge in specific clinical areas (Wikipedia). They identify research questions, design and conduct scientific studies, collect and analyze data and report their findings. Many teach in academic settings and/or conduct their research within teaching hospitals. To address complex problems, they often partner with scientists in other fields, such as medicine, pharmacy, nutrition and engineering.

PhD vs DNP: Nurse scientists are prepared at the PhD or DScN level which is a research doctoral degree and are responsible for generating the data and evidence. The DNP (Doctor of Nursing Practice) is a practice doctoral degree responsible for translating and applying the research and evidence into nursing practice.

Meet our NUSOM Nurse Scientists and read about some of the work our team is doing:



[Paolo Colet, PhD, MAN](#)
Joined NUSOM February
2017



[Joseph Almazan, DScN, RN](#)
Joined NUSOM July 2019



[Jonas Cruz, PhD, MAN](#)
Joined NUSOM July 2021



[Ejercito Balay-odao, PhD,
MSN](#). Joined NUSOM
December 2022

SHARED BY NANCY L. STITT, BSN, RN, NP-BC (BOARD-CERTIFIED IN NURSING PROFESSIONAL DEVELOPMENT) PROGRAM DIRECTOR; NURSING EDUCATION

ACCELED (CO-FUNDED BY ERASMUS+) PROGRESS TOWARDS ADVANCING QUALITATIVE RESEARCH IN KAZAKHSTAN

NUSOM nursing faculty in collaboration with European expert co-lead two masterclasses in capacity building for advancing qualitative research at the master's and doctoral levels of nursing education in Kazakhstan. These masterclasses were created to help nursing educators and researchers in Kazakhstan improve their knowledge and skills in doing qualitative research. The first masterclass conducted in LSMU in June 2022, covered the principles of qualitative research, such as research design, data gathering, and analysis methods. The second masterclass held in NUSOM in January 2023 delved deeper into data collection and data analysis with Atlas.ti, and most importantly on teaching strategies for qualitative research course. The masterclasses were delivered by NUSOM nursing researchers together with European partners (LSMU, JAMK, UMCU, Abo), bringing much knowledge and skills to share with their Kazakhstani colleagues.

NUSOM nursing research team: Joseph Almazan, Jonas Cruz, Anargul Kuntuganova, MBA (MPH Faculty), Ejercito Balay-Odao, Nancy Stitt, Alma Syzdykova (UMC Administration).

NUSOM AND UMC EVIDENCE IMPLEMENTATION NURSING JOURNAL CLUB

In January 2023, NUSOM's nursing faculty facilitated the integration of a nursing journal club at UMC following the JBI evidence implementation approach, focusing on evidence implementation. The journal club received mixed feedback from participants, which indicates that nurses are ready to learn evidence-based practice to advance patient care and the nursing profession.

The journal club meetings took place once a month, with each meeting focusing on a different topic linked to evidence-based practice. The faculty members leading the seminars instructed participants on how to critically evaluate the articles and apply the findings to clinical practice. Participants were invited to express their own perspectives and experiences, creating a collaborative learning environment. The journal club proven to be a helpful platform for nurses to stay current on new research and improve their abilities in adopting evidence-based practice. As a consequence of the excellent feedback, plans are in the works to expand the journal club to additional Kazakhstani healthcare facilities.

NUSOM/UMC nursing journal club coordinators: Paolo Colet, (UMC Nursing and Administration: Alma Syzdykova, Gulnur Nadirbekova, Bakhytgul Baigulina, Gulmira Musinova, Gaukhar Kasimova, Tatjana Malysheva, Elmira Dosymbayeva, Dinara Shakenova)

UMC NURSING RESEARCH MENTORSHIP

NUSOM nursing professors conducted a professional development program for nurses at UMC on the research process from inception to publication in June 2022. As part of a mentorship program, 20 nurses are working with nursing faculty on four research projects (on peripheral intravenous catheters, pressure ulcer, and nurses' working environment). The mentorship serves three purposes: it builds nurses' research capacity, it helps them achieve their strategic goals, and it helps them incorporate evidence in their practice. One project has finish and already been submitted for journal for potential publication, and the other three are expected to be completed by June 2023. With our success, there is a plan now to create a Nursing Research Group within UMC to further improve the hospital nursing research capacity and their research output.

NUSOM nursing research mentors: Jonas Cruz, Joseph Almazan, Paolo Colet, Ejercito Balay-Odao, and Arnur Gusmanov, MD, MPH

SHARED BY PAOLO COLET, JOSEPH ALMAZAN, NANCY STITT, JONAS CRUZ, EJERCITO BALAO-ODAO

THE QAZ GREEN HEALTH PROJECT: DEVELOPING THE ENVIRONMENTAL SUSTAINABILITY IN HEALTHCARE COMPETENCE OF THE PRESENT AND FUTURE HEALTHCARE WORKFORCE IN KAZAKHSTAN

Climate change is considered the most significant challenge for humanity in the 21st century, posing a considerable threat to people and health, the economy, and the environment at the global, national, and local levels. The healthcare system has a considerable contribution to global environmental impacts. Evidence from earlier studies suggests sustainable healthcare education in medical universities, colleges, and healthcare facilities. Experts, healthcare workers, and students have long agreed to integrate climate change and environmental sustainability into healthcare curricula. Therefore, the project's main objective is to create and sustain an environmentally sustainable healthcare system in Kazakhstan by building the capacity and competence of the present and future healthcare workforce in environmental sustainability in healthcare. The project will design, develop, implement, and evaluate two environmental sustainability courses in healthcare to enhance healthcare workers' and students' capacity and competence. The main expected result of this research project is the development of the capacity of present and future healthcare workers in Kazakhstan to practice environmentally sustainable healthcare. By creating two courses on environmental sustainability in healthcare, healthcare workers and students are expected to improve their knowledge about environmental issues and climate change and their impact on health, develop a positive attitude toward the environment and enhance their competencies in skills related to environmentally sustainable healthcare. This endeavor is expected to lead to an increased workforce with skilled human resources aware of environmental concerns and their management. The two courses will be recommended to the Ministries of Health, Science, and Higher Education for national implementation. This is an initial and critical step in creating environmentally sustainable healthcare in the country.

The research team is led by the PI, Jonas Cruz, Ph.D., and the co-PI, Paolo Colet, Ph.D., both faculty members of the nursing program at NUSOM. The research group comprises multi-disciplinary members working in healthcare programs and facilities at three leading universities in the country: Nazarbayev University, Karaganda Medical University, and JSC «South Kazakhstan Medical Academy.» The members have expertise and experience in medicine, nursing, public health, anatomy, clinical practice, higher education, and management. This project is one of the inaugural research projects to be funded by the Central Asian Research Centre for Education Innovation and Transformation (CARCEIT). CARCEIT was established in November 2022 and is envisioned to become Central Asia's educational research leader. CARCEIT aims to produce high-quality research to provide evidence for educational policies and practices. The project will run from May 2023 to December 2025.

SHARED BY JONAS CRUZ

ARTIFICIAL INTELLIGENCE FOR DIETARY INTERVENTIONS IN CENTRAL ASIA



In recent years, the application of Artificial Intelligence (AI) has been gaining significant traction in the food industry, offering novel opportunities for identifying food items and improving food product characteristics. Researchers around the world are exploring the use of AI for dietary assessment, which has the potential to revolutionize traditional methods of collecting and analyzing dietary data that are often laborious and subjective. Applying computer vision techniques, we have created the first Central Asia Food Dataset. This dataset contains high-quality annotated 16,499 images of dishes that are commonly consumed in Kazakhstan (KZ), spanning across 42 food classes (Figure 1 below).

With extensive parametric experiments, we have achieved a Top-1 accuracy of 88% on the ResNet152 model, demonstrating the robustness of our dataset and classification models. The overarching aim of this project is to create a user-friendly online tool to implement effective nutritional surveillance and potentially help to reduce diet-related diseases and deaths in KZ. The availability of this dataset paves the way for further research in the field of nutrition, such as precision nutrition, where AI offers promising potential applications.



Additionally, AI has also emerged as a promising tool in addressing global challenges related to food adulteration, food fraud, and food security. Last September 2022, Dr Mei-Yen Chan and the project team presented at the conference «AI for detecting food fraud,» held by the Food and Agriculture Organization/World Health Organization Coordinating Committee for Europe of the Codex Alimentarius Commission. The aim of the conference was to raise awareness of AI methods used to detect food adulterations, which are crucial in current times of global food security challenges.

Subsequently, Dr Chan was invited to deliver a talk on «Artificial Intelligence for Dietary Interventions» at the International Scientific Practical Conference «Nutrition: Health and Disease in Almaty on 19 October 2022. This provided us with an opportunity to share our research work with a wider audience in Kazakhstan, emphasizing the importance of AI in facilitating dietary assessment and as well as further enhancing nutritional literacy of local KZ population.

We would like to express our gratitude to Ms Aknur Karabay and the team of data scientists at the Institute of Smart Systems and Artificial Intelligence (ISSAI) and Professor Atakan Varol for their invaluable and on- going contributions to this collaborative research project between the School of Medicine and ISSAI.

Relevant Selected Citations including the newly published manuscript:

Kendall H, Kuznesof S, Dean M, Chan MY, Clark B, Home R, Frewer L. Chinese consumer's attitudes, perceptions and behavioural responses towards food fraud Food Control 2019; 95, 339-35 (Q1, IF 6.652, CiteScore 9.3).

Karabay A, Bolatov A, Varol HA, Chan M-Y. A Central Asian Food Dataset for Personalized Dietary Interventions. Nutrients. 2023; 15(7):1728. <https://doi.org/10.3390/nu15071728> (Q1, IF 6.706, CiteScore 7.9)

THE MASTER IN MOLECULAR MEDICINE (MMM) IS AGING WELL



In this issue of the NU Research Newsletter, we wish to showcase an example of successful integration of teaching, learning and research, the Master in Molecular Medicine at NUSOM.

In Spring 2015 efforts started on the development of the Master in Molecular Medicine (MMM) at NUSOM. In 2017, after a careful organization process, involving Faculty at NUSOM and one course

from NUGSB, the MMM started with Class 2019.

The MMM is a unique Master for Central Asia and CIS countries and covers a topic of enormous biomedical power, essential to a technologically growing country such as Kazakhstan. MMM students are exposed to state of the art knowledge of molecular medicine and, after graduation, they can apply their knowledge and experimental skills in Kazakhstan and worldwide.

The MMM is mainly centered on the molecular aspects of disease and the technological power of human intervention for diagnosis, prevention and therapy. Students are exposed to research-based course material and activities, and hands-on direct experience is provided

in two courses (one based on computing and one on wet lab) and the last semester is entirely dedicated to the experimental research thesis.

With 45 graduates over 4 Classes (2019-2022) and only 3 graduates (from Class 2022) looking for employment abroad, at present the MMM has an employment rate of 95%. An equal number of PhD students and Research Assistants sums up to 32 MMM graduates, clearly indicating biomedical experimental research as the favored activity pursued by MMM graduates. Among the 16 PhD students, 5 are currently enrolled in prestigious PhD programs abroad (Japan, Austria, Germany, Finland and Switzerland), representing more than 10% of the MMM graduates. We are happy to announce that one graduate from the first cohort has just graduated in Austria and been accepted for a Post-Doc position in the US (in the Wang Lab at the Medical Discovery Institute of Sanford Burnham Prebys on Tumor Initiation and Maintenance) and is very much looking forward to applying to a Post-Doc position in NU after completion of her 1st Post-doc in the US and continue her academic career in Kazakhstan and possibly NU.

Each year, the number of applicants is significantly higher than the number of students accepted in the program, a feature that allows for a selection of very strong candidates. Currently, the MMM runs with 11 Class 2023 and 13 Class 2024 students. The perception is that the average quality of the applicants is regularly very high and increasing. Following the departure of Dr. Vangelista the program is now led by Prof. Barlev who joined NU and the SOM in 2022.



Photo: The MMM Director with Classes 2023/24 students in classes December 2022

THE SCIENTIFIC PRODUCTION CONTRIBUTED BY MMM STUDENTS AND GRADUATES (IN BOLD, SOMETIMES ALSO AS FIRST AUTHORS) IS ALSO SIGNIFICANT, WITH THE FOLLOWING PUBLICATION RECORD:

- Ogay V, Mun EA, Kudaibergen G, Baidarbekov M, Kassymbek K, Zharkinbekov Z & Saparov A. Progress and prospects of polymer-based drug delivery systems for bone tissue regeneration. *Polymers (Basel)* 12:2881 (2020)
- Dossybayeva K, Abdukhakimova D & Poddighe D. Basophils and Systemic Lupus Erythematosus in Murine Models and Human Patients. *Biology (Basel)* 9:308 (2020)
- Kienzl M, Hasenoehrl C, Valadez-Cosmes P, Maitz K, Sarsembayeva A, Sturm E, Heinemann A, Kargl J, Schicho R. IL-33 reduces tumor growth in models of colorectal cancer with the help of eosinophils. *Oncoimmunology* 9:1776059 (2020)
- Kienzl M, Hasenoehrl C, Maitz K, Sarsembayeva A, Taschler U, Valadez-Cosmes P, Kindler O, Ristic D, Raftopoulou S, Santiso A, Bärnthaler T, Brcic L, Hahnefeld L, Gurke R, Thomas D, Geisslinger G, Kargl J, Schicho R. Monoacylglycerol lipase deficiency in the tumor microenvironment slows tumor growth in non-small cell lung cancer. *Oncoimmunology* 10:1965319 (2021)
- Berillo D, Zharkinbekov Z, Kim Y, Raziyeva K, Temirkhanova K & Saparov A. Stimuli-Responsive Polymers for Transdermal, Transmucosal and Ocular Drug Delivery. *Pharmaceutics* 13:2050 (2021).

- Kim Y, Zharkinbekov Z, Sarsenova M, Yeltay G & Saparov A. Recent Advances in Gene Therapy for Cardiac Tissue Regeneration. *Int. J. Mol. Sci.* 22:9206 (2021).
- Raziyeva K, Kim Y, Zharkinbekov Z, Kassymbek K, Jimi S & Saparov A. Immunology of Acute and Chronic Wound Healing. *Biomolecules* 11:700 (2021)
- Berillo D, Yeskendir A, Zharkinbekov Z, Raziyeva K & Saparov A. Peptide-Based Drug Delivery Systems. *Medicina* 57:1209 (2021)
- Poddighe D, Dossybayeva K, Bexeitov Y & Mukusheva Z. Basophils in autoimmunity: Systemic lupus erythematosus and more? *Autoimmun. Rev.* 20:102790 (2021)
- Poddighe D, Abdukhakimova D, Dossybayeva K, Mukusheva Z, Assylbekova M, Rakhimzhanova M, Ibrayeva A, Mukash G & Tuleutayev Y. *Mycoplasma pneumoniae* Seroprevalence and Total IgE Levels in Patients with Juvenile Idiopathic Arthritis. *J. Immunol. Res.* 2021:6596596 (2021)
- Abdukhakimova D, Dossybayeva K, Grechka A, Almukhamedova Z, Boltanova A, Kozina L, Nurgaliyeva K, Hasanova L, Tanko MN & Poddighe D. Reliability of the Multiplex CytoBead CeliAK Immunoassay to Assess Anti-tTG IgA for Celiac Disease Screening. *Front. Med. (Lausanne)* 8:731067 (2021)
- Abdukhakimova D, Dossybayeva K & Poddighe D. Fecal and Duodenal Microbiota in Pediatric Celiac Disease. *Front. Pediatr.* 9:652208 (2021)
- Coelho T, Sonnenberg-Riethmacher E, Gao Y, Mossotto E, Khojanazarov A, Griffin A, Mukanova S, Ashimkhanova A, Haggarty R, Borissenko A, Ashton JJ, Stafford IS, Batra A, Afzal NA, Stanton MP, Vadgama B, Adrisova K, Beattie RM, Williams AP, Ennis S & Riethmacher D. Expression profile of the matricellular protein periostin in paediatric inflammatory bowel disease. *Sci. Rep.* 11:6194 (2021)
- Dossybayeva K, Bexeitov Y, Mukusheva Z, Almukhamedova Z, Assylbekova M, Abdukhakimova D, Rakhimzhanova M & Poddighe D. Analysis of Peripheral Blood Basophils in Pediatric Systemic Lupus Erythematosus. *Diagnostics (Basel)* 12:1701 (2022)
- Poddighe D, Romano M, Dossybayeva K, Abdukhakimova D, Galiyeva D & Demirkaya E. Celiac Disease in Juvenile Idiopathic Arthritis and Other Pediatric Rheumatic Disorders. *J. Clin. Med.* 11:1089 (2022)
- Raziyeva K, Kim Y, Zharkinbekov Z, Temirkhanova K & Saparov A. Novel Therapies for the Treatment of Cardiac Fibrosis Following Myocardial Infarction. *Biomedicines* 10:2178 (2022)
- Assylbekova A, Zhanapiya A, Grzywa R, Sienczyk M, Schönbach C & Burster T. Camostat Does Not Inhibit the Proteolytic Activity of Neutrophil Serine Proteases. *Pharmaceuticals (Basel)* 15:500 (2022)
- Amerzhanova Y & Vangelista L. Filling the gaps in antagonist CCR5 binding, a retrospective and perspective analysis. *Front. Immunol.* 13:826418 (2022)
- Sarsenova M, Kim Y, Raziyeva K, Kazybay B, Ogay V & Saparov A. Recent Advances to Enhance the Immunomodulatory Potential of Mesenchymal Stem Cells. *Front. Immunol.* 13:1010399 (2022)
- Mukanova S, Borissenko A, Kim A, Bolatbek A, Abdrakhmanova A, Vangelista L, Sonnenberg-Riethmacher E & Riethmacher D. Role of periostin in inflammatory bowel disease development and synergistic effects mediated by the CCL5-CCR5 axis. *Front. Immunol.* 13:956691 (2022)
- Sarsembayeva A, Kienzl M, Gruden E, Ristic D, Maitz K, Valadez-Cosmes P, Santiso A, Hasenoehrl C, Brcic L, Lindenmann J, Kargl J, Schicho R. Cannabinoid receptor 2 plays a pro-tumorigenic role in non-small cell lung cancer by limiting anti-tumor activity of CD8⁺ T and NK cells. *Front Immunol.* 13:997115 (2023)

SHARED BY LUCA VANGELISTA, NICK BARLEV AND DIETER RIETHMACHER



School of Engineering & Digital Sciences

DRIVING DROWSINESS DETECTION USING SPECTRAL SIGNATURES OF EEG-BASED NEUROPHYSIOLOGY

1. Introduction

Drowsy driving is a serious public safety concern, contributing to a large number of road crashes and fatalities around the world. Detecting drowsiness in drivers at an early stage is critical to reducing the risk of accidents and improving road safety. To this end, researchers have developed a passive brain-computer interface (pBCI) scheme using multichannel electroencephalography (EEG) brain signals for accurate and spatially localized detection of human drowsiness during driving tasks, as shown in Fig. a. This study presents a comprehensive analysis of the effectiveness of this pBCI modality in detecting drowsiness in healthy, sleep-deprived subjects using six EEG channels spread over the right and left hemispheres in the prefrontal, frontal, and occipital cortices of the brain. The study also employs various feature selection methods and conventional machine learning classifiers to classify the extracted drowsiness attributes, resulting in an optimized ensemble model with high accuracy and precision. This research has significant implications for improving road safety and reducing the risk of drowsy driving-related accidents.

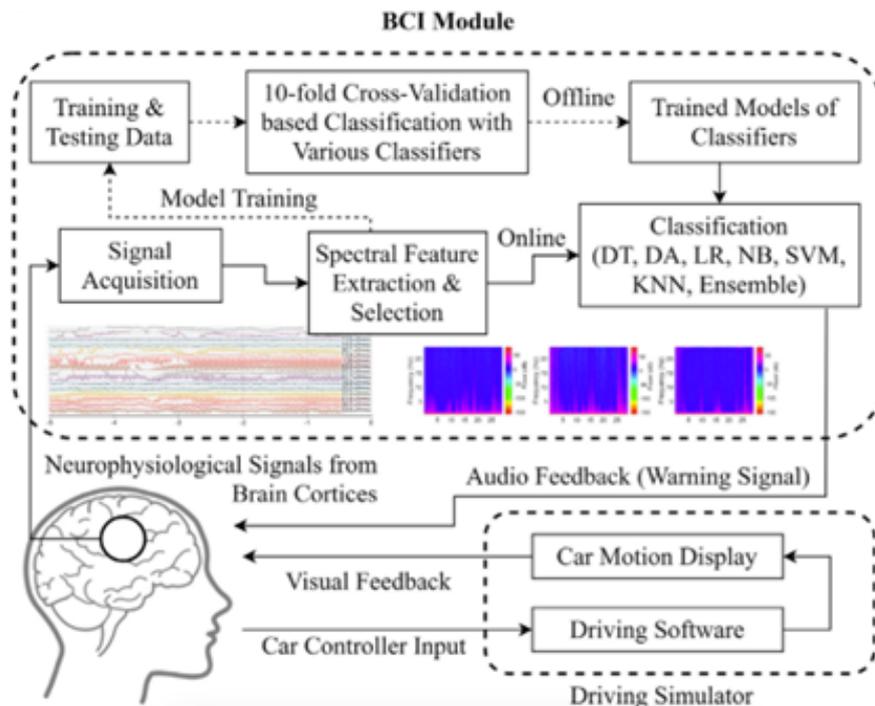


Figure a. Process flow diagram for BCI module.

2. Methods

The study, published in the Journal of Frontiers in Physiology, involved 12 healthy subjects who were sleep-deprived and had their neurological states recorded using six EEG channels spread over the right and left hemispheres in the prefrontal, frontal, and occipital cortices of the brain.

Spectral signatures of the δ , θ , α , and β rhythms were extracted, and feature selection methods were used for global feature ranking. The extracted drowsiness attributes were classified using conventional machine learning classifiers, and the binary classification results were reported with confusion matrix-based performance assessment metrics.

3. Results

The optimized ensemble model achieved the best results of drowsiness classification with 85.6% accuracy and precision, 89.7% recall, 87.6% F1-score, 80% specificity, 70.3% Matthews correlation coefficient, 70.2% Cohen's kappa score, and 91% area under the receiver operating characteristic curve with 76-ms execution time, as shown in Fig. b. The best results were obtained at the F8 electrode position in the right frontal cortex of the brain.

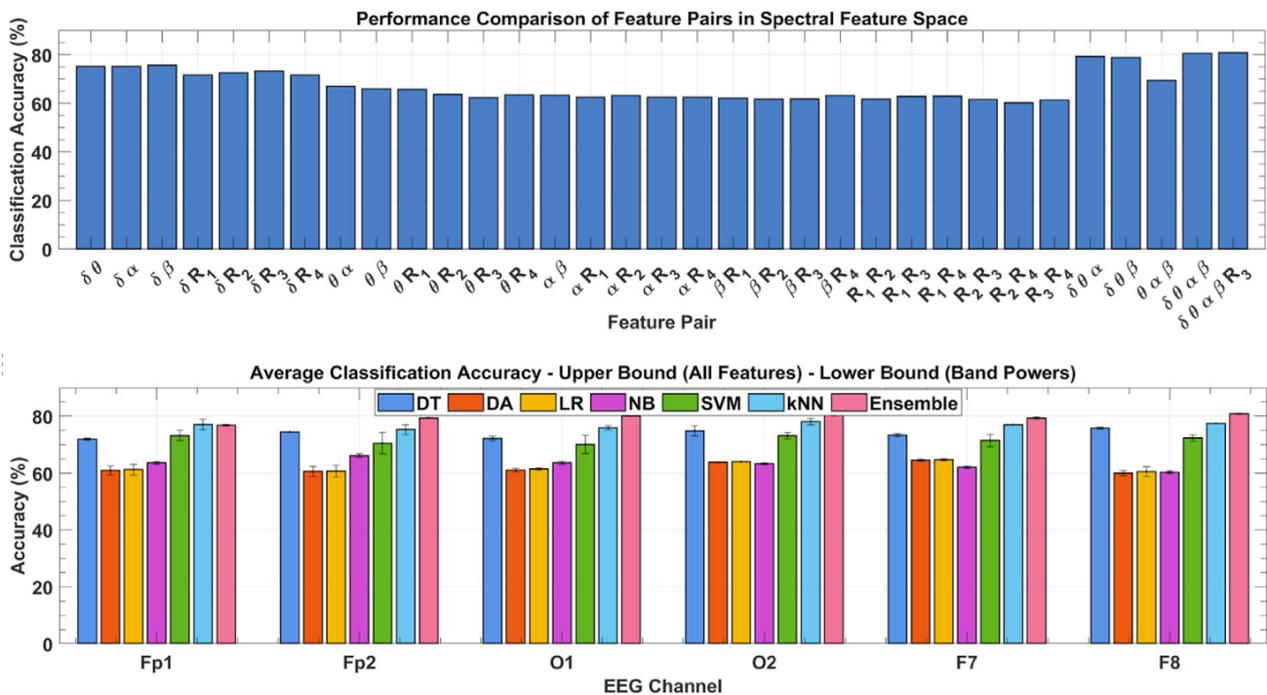


Figure b. (A) Classification performance comparison among feature combinations of spectral feature space for the F8 channel with ensemble classifier overall subject's data. (B) Classification performance comparison among various classifiers for the F8 channel overall subject's data with variance bounds obtained with varying feature combinations.

4. Conclusion

The passive brain-computer interface (pBCI) scheme proposed in this study has achieved better results in detecting driving drowsiness, thereby fulfilling multiple objectives. The predictor importance approach employed in the study has successfully reduced the feature extraction cost and minimized computational complexity by using conventional machine learning classifiers. As a result, this approach has resulted in low-cost hardware and software requirements for implementation.

Furthermore, the channel selection approach employed in the study has effectively spatially localized the most promising brain region for detecting drowsiness with only a single EEG channel (F8). This approach reduces the physical intrusiveness in normal driving operations and offers a more streamlined detection method. The effectiveness of this approach is supported by the high accuracy and precision achieved in the results obtained through the study's optimization of an ensemble model.

The channel selection approach has implications for the practical implementation of the proposed scheme, as it reduces the number of EEG channels required for effective drowsiness detection. This reduction in the number of channels will ultimately lead to reduced complexity and costs in

hardware and software requirements. Additionally, the physical intrusiveness of the approach is minimized, making it more comfortable and convenient for drivers to use.

Overall, the proposed scheme offers a promising solution to the problem of detecting driving drowsiness with its ability to accomplish multiple objectives while being cost-effective and less intrusive. These findings have significant implications for improving road safety and reducing the number of casualties related to drowsy driving.

5. Funding Support

This study was made possible through Nazarbayev University, School of Engineering and Digital Sciences funding under the Social Policy Research Grant. The research was conducted with expert researchers from HITEC University, Taxila, and COMSATS University, Islamabad, Pakistan. The dedication and expertise of the researchers were instrumental in the successful completion of this study and in advancing the field of driving drowsiness detection. The funding organization's support and the researchers' hard work have contributed to developing a passive brain-computer interface (pBCI) scheme for more accurate and efficient detection of driving drowsiness, with significant implications for improving road safety.

The research paper, «Driving drowsiness detection using spectral signatures of EEG-based neurophysiology,» is available at doi:[10.3389/fphys.2023.1153268](https://doi.org/10.3389/fphys.2023.1153268).

PREPARED BY PROF. HASHIM ALI

SMARTPHONE APPLICATION FOR ASTANA TOURISTS

Students of the Internet of Things labs in the Computer Science department created an app which can recognize monuments and places in Astana with the help of machine learning and cloud computing. The app can be used by tourists and visitors to recognize important places in the city. All that the visitor has to do is to use the app to take a picture of the monument, and after a while the app will display information about this monument. The application is not yet available to the public but someone who is interested can watch the video by scanning the following QR code.



SHARED BY PROF. DIMITRIOS ZORBAS

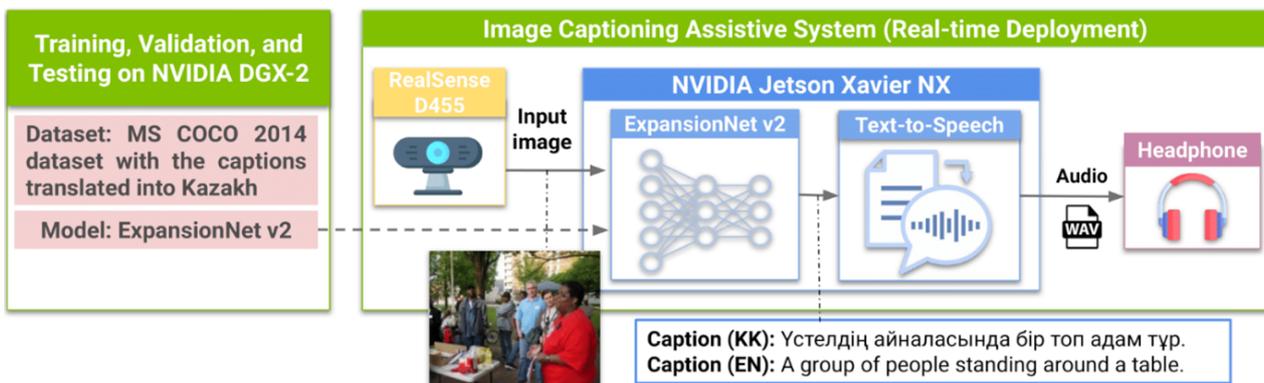
DEEP LEARNING ON THE EDGE: AN ASSISTIVE DEVICE FOR VISUALLY IMPAIRED AND BLIND



In 2023, ISSAI aims to improve accessibility for visually impaired and blind people by developing assistive devices utilizing advanced deep learning techniques, e.g., image captioning, visual question answering, and text-to-speech technology. The first prototype is already capable of assisting a person by providing a real-time audio description of a scene in Kazakh language.

An advanced open-source image captioning model was adapted and trained on a benchmark Microsoft COCO dataset consisting of over 600k image-caption pairs, where captions had been preliminary translated into Kazakh using cloud-based machine-translation services. The quality of the translation was ensured by common evaluation metrics, computed for a sample of 2.5K machine and human-translated captions.

The trained model was optimized and then deployed with the ISSAI's [KazakhTTS](#) engine to Nvidia Jetson Xavier NX single-board computer as an elegant implantation of edge AI. To capture images, the module was connected to the Intel RealSense camera. Additionally, the system was equipped with headphones, a power bank and a push-button, activating the inference.



Experiments conducted in real-world conditions with a blindfolded participant showed promising results. The device proves its effectiveness in providing a person with a relevant audio description of the captured scene, giving them a perception of the surrounding environment. As part of this ongoing project, the assistive device is planned to be further

improved by adding the Visual Question Answering functionality. This way, the device will be able not only to provide descriptions but also to answer specific questions regarding a scene, giving blind or visually impaired people a clearer picture of their surroundings.

A corresponding research paper entitled “Image Captioning for the Visually Impaired and Blind: A Recipe for Low-Resource Languages” was accepted for publication in the proceeding of the 45th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2023), which will be held in Sydney, Australia in July 2023.

ISSAI shares the codes, data and pre-trained models to ensure research reproducibility and stimulate further research in this area at its [GitHub repository](#).



School of Mining and Geosciences News

CHEMICAL ENHANCED OIL RECOVERY FOR A SANDSTONE FIELD IN KAZAKHSTAN



Excessive water production is a common challenge encountered in oil reservoirs worldwide, which can significantly reduce the profitability of oil production. To address this challenge, it is necessary to control and reduce the water cut, for which enhanced oil recovery (EOR) techniques are designed and applied to decrease water production and improve oil mobility in porous media. Chemicals such as polymers, surfactants, alkalis, and nanofluids are commonly used to increase oil sweeping in a reservoir. The oil industry in Kazakhstan also faces similar challenges in different oil fields, such as a sandstone field in West Kazakhstan. The field was discovered more than 60 years ago and is estimated to contain about nine billion barrels of initial oil in place. After years of production, the current water cut in the field is high, and new oil recovery methods are required to assist the operators to address this problem effectively. Based on a preliminary study, chemical EOR was selected as a possible option for future development in the field. Proper experimental evaluation and analysis are necessary to successfully implement a chemical flooding technique.

In 2022, KazMunayGas (KMG) and the School of Mining and Geosciences (SMG) initiated a joint project to conduct comprehensive experimental research aimed at designing a chemical flooding technique for this sandstone field in Kazakhstan. The project is funded by Samruk-Kazyna and is the first such joint research in SMG. The first phase of the project involved screening appropriate polymers, surfactants, and alkalis and conducting oil displacement analysis. A team of researchers at SMG successfully completed this phase. KMG specialists evaluated the project's findings to be implemented at the field scale. The project's second phase is currently ongoing and aims to improve the performance of the proposed method by incorporating novel approaches, such as nanotechnology. By employing these advanced techniques, the joint project aims to significantly improve the overall profitability of oil production from the field in Kazakhstan.

Professor Peyman Pourafshary (SMG) is the project's PI, and a group of students under his supervision conducted the research in the first phase and are still working on the project. The following list shows the names of the team who are currently involved in the project:

- Mariam Shakeel (PhD Student, Petroleum Engineering)
- Madi Yesmukhambet (MSc Student, Petroleum Engineering)
- Daniyar Yerniyazov (MSc Student, Petroleum Engineering)
- Laila Maratbekkyzy (MSc Student, Petroleum Engineering)
- Amina Dauyltayeva (MSc Student, Petroleum Engineering)
- Azamat Bukayev (BSc Student, Petroleum Engineering)
- Razida Kenes (BSc Student, Petroleum Engineering)
- Dilyara Sagandykova (BSc Student, Petroleum Engineering)

RESEARCH PUBLICATIONS PERFORMANCE

Co-authored publications per country/region:



collaborating Institutions

● Top 10 Institutions worldwide by co-authored publications



In this issue, we are delighted to present you an overview of research activities conducted under the auspices of Nazarbayev University. Since its inception in 2011, Nazarbayev University faculty members and researchers have released 7,251 peer-reviewed publications indexed by Scopus, and have been cited 72,825 times for 2011-2023 period (SciVal, April 28, 2023). The approximate number of citations per peer-reviewed publication is 10. The overall H-index of NU is 90, whereas H5- index is 53. The field-weighted citation impact is 1.28, meaning that our publications have been cited 28% more than would be expected based on the world average for similar publications. The map above demonstrates the collaboration between NU and other institutions across the

globe based on co-authored publications over the period from 2018 to 2023. There are 3,698 NU research papers published in collaboration with international institutions, which accounts for 67.2% of the total number of publications produced by our University with the overall Field-Weighted Citation Impact of 1.38 (as of April 10, 2023). For getting more comprehensive information on the research performance at NU, please have a look at the following [presentation](#) prepared using SciVal research evaluation platform. If you have any questions regarding the provided information, please contact Saule Sadykova (ssadykova@nu.edu.kz)

FUNDING OPPORTUNITIES

#	Opportunity	Funder	Deadline	Source link
1	The Inspiring Women in Science Awards 2023	Nature awards	08.05.2023	URL
2	"Optimizing Response of Rheumatoid Arthritis (RA) to Therapeutic Agents: Request for Proposals on Treatmentfocused RA Research"	The Arthritis Foundation	17.05.2023	URL
3	Wellcome early-career awards	Wellcome	18.05.2023	URL
4	ERC advanced grant (erc-2023-adg)	ERC Horizon Europe Framework Programme	23.05.2023	URL
5	2023 Silk Roads Youth Research Grant	UNESCO	31.05.2023	URL
6	2023 Autism Hero Awards	Anna Kennedy Online Charity	02.06.2023	URL
7	ACS Women Chemists Committee Rising Star Award (worldwide)	American Chemical Society	15.06.2023	URL
8	Eppendorf & Science Prize for Neurobiology (worldwide)	The Eppendorf & Science	15.06.2023	URL
9	Neuroimaging and CSF Biomarker Program (Alzheimer's disease)	Alzheimer's Drug Discovery Foundation	04.07.2023	URL
10	ISESCO RESEARCH GRANTS	ISESCO RESEARCH GRANTS	31.07.2023	URL
11	Green hydrogen	Merck group	31.08.2023	URL
12	Imaging Research in Alzheimer's and Other Neurodegenerative Diseases	Alzheimer's Association	07.09.2023	URL
13	ESCMID research grants 2024	ESCMID	13.09.2023	URL
14	ERC Proof of Concept Grant (ERC-2023-POC)	ERC Horizon Europe Framework Programme	21.09.2023	URL
15	American Tinnitus Association's grant program	The American Tinnitus Association	rolling basis	URL
16	Research Grants and Support	Nestlé Foundation	rolling basis	URL
17	Carl Zeiss Humboldt Research Award	the Humboldt Foundation	rolling basis	URL
18	Fraunhofer-Bessel Research Award	the Humboldt Foundation	rolling basis	URL
19	Friedrich Wilhelm Bessel Research Award	the Humboldt Foundation	rolling basis	URL
20	Clean Energy Accelerator	Amazon	rolling basis	URL
21	Project Grants	The Myrovlytis Trust	rolling basis	URL
22	Small/ Pilot Studies	The Myrovlytis Trust	rolling basis	URL
23	Energy Foundation's grants	Energy Foundation China	rolling basis	URL
24	Impact Collaboration Programme (ICP 2023)	The Geneva Science-Policy Interface	rolling basis	URL
25	Research Core Award: Non-rodent Large Animal Model for Inherited Retinal Disease (worldwide)	Foundation Fighting Blindness	rolling basis	URL

New research papers indexed by Scopus (count: 339 as of April 27)

- Abbas, A. H., Abd Alsaheb, R. A., & Abdullah, J. K. (2023). Comparative study of natural chemical for enhanced oil recovery: Focus on extraction and adsorption at quartz sand surface. *Petroleum*, 9(1), 83-93. doi:10.1016/j.petlm.2022.01.007
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