This collection of research projects is dedicated to Sustainable Development Goal 11 — Sustainable Cities and Communities. It presents innovative technological solutions aimed at improving urban infrastructure safety, including earthquake prediction using machine learning and deep neural networks, real-time detection of road surface damage, and advanced systems for classifying urban noise. These technologies directly contribute to strengthening the resilience and safety of smart cities.

The second important block of research focuses on urban ecology and the preservation of cultural heritage. Mathematical modeling of the dispersion of transport emissions in Almaty, analysis of long-term air temperature trends across Kazakhstan, and assessment of ecosystem health in different regions support environmental sustainability. In addition, enhancing the tourism potential of Astana and Almaty, as well as protecting cultural treasures such as the Turkic petroglyphs and the epic The Book of Dede Korkut, highlights the importance of preserving the cultural identity of cities.

Overall, these studies contribute to creating safer, more environmentally sustainable, and culturally vibrant urban environments.

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Title	Predicting the Likelihood of an Earthquake by Leveraging Volumetric Statistical Data Through Machine Learning Techniques
Authors	Nurtas, M.| Zhantaev, Z.| Altaibek, A.| Nurakynov, S.| Mekebayev, N.| Shiyapov, K.| Iskakov, B.| Ydyrys, A.
Year	2023
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85185607207&origin=resultslist
DOI	10.30919/es1031

2

Title	Research of a Fiber Sensor Based on Fiber Bragg Grating for Road Surface Monitoring
Authors	Kashaganova, G.| Kozbakova, A.| Kartbayev, T.| Balbayev, G.| Togzhanova, K.| Alimseitova, Z.| Orazaliyeva, S.
Year	2023
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85161571642&origin=resultslist
DOI	10.3390/electronics12112491

3

Title	Real-Time Road Damage Detection System on Deep Learning Based Image Analysis
Authors	Kulambayev, B.| Gleb, B.| Katayev, N.| Menglibay, I.| Momynkulov, Z.
Year	2024
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-86000673800&origin=resultslist
DOI	10.14569/IJACSA.2024.01509107

4

Title	New Questions in the Examination of Korkut's Epic Heritage: Forgery and Fake Replacements
Authors	Koniratbay, T.| Kerimbek, J.| Darkenbayeva, A.| Bekmoldinov, N.| Sultanova, M.
Year	2023
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85163598966&origin=resultslist
DOI	10.58242/millifolklor.1072507

5

Title	Pollen morphology of broadleaf trees growing in different health conditions in the city of Aktobe
Authors	Utarbayeva, N.| Aipeisova, S.| Maui, A.| Kazkeev, E.| Bimagambetova, G.| Kukenov, Z.
Year	2021
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85113583560&origin=resultslist
DOI	10.2525/ecb.59.135

6

Title	Evolution of long-term trends and variability in air temperatures of Kazakhstan for the period 1963–2020
Authors	Bayer-Altın, T.| Sadykova, D.| Türkeş, M.
Year	2024
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85172918212&origin=resultslist
DOI	10.1007/s00704-023-04650-7

7

Title	Development of a Framework for Classification of Impulsive Urban Sounds using BiLSTM Network
Authors	Katayev, N.| Altayeva, A.| Abduraimova, B.| Kurmanbekkyzy, N.| Madibaiuly, Z.| Kulambayev, B.
Year	2023
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85179392527&origin=resultslist
DOI	10.14569/IJACSA.2023.0141148

8

Title	Ecosystem Health Assessment of the Zerendy District, Kazakhstan
Authors	Alipbeki, O.| Grossul, P.| Rakhimov, D.| Kupidura, P.| Alipbekova, C.| Musaif, G.| Turekeldiyeva, R.| Augambaev, K.| Begaliyeva, M.
Year	2025

Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85214499766&origin=resultslist
DOI	10.3390/su17010277

9

Title	Deep Convolutional Neural Network for Accurate Prediction of Seismic Events
Authors	Turarbek, A.| Bektemesov, M.| Ongarbayeva, A.| Orazbayeva, A.| Koishybekova, A.| Adetbekov, Y.
Year	2023
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85181003227&origin=resultslist
DOI	10.14569/IJACSA.2023.0141064

10

Title	STUDY OF THE CURRENT STATE AND PROSPECTS FOR THE DEVELOPMENT OF TOURIST FLOW IN THE CITY OF ALMATY, KAZAKHSTAN
Authors	Zheldibayev, A.| Kulazhanov, Y.| Moldagaliyeva, A.| Abdildayeva, N.| Zhoya, K.| Sarkitkan, K.| Savanchiyeva, A.| Aldasheva, A.| Askarova, M.| Pavlichenko, L.
Year	2024
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85213885987&origin=resultslist
DOI	10.30892/gtg.574spl09-1362

11

Title	LEVERAGING ASTANA'S TOURISM TO BUILD A "BRAND CITY" REPUTATION
Authors	Sadykova, D.| Mamirova, K.| Asenov, A.| Kenzhebaj, R.| Kubessova, G.
Year	2025
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85211718538&origin=resultslist
DOI	10.35588/cb84nm08

12

Title	Evaluating the Status of Humulus Lupulus Populations in Kazakhstan: Implications for Conservation, Sustainability, and Forest Ecosystem Management
Authors	Yedilova, A.| Inelova, Z.| Zhamanbayeva, M.| Kiyekbayeva, L.| Yerubayeva, G.| Sarsembayeva, A.| Baitasheva, G.| Ashirova, Z.| Nazarbekova, S.| Satybaldiyeva, G.| Bauyrzhan, T.
Year	2025

Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-105001679029&origin=resultslist
DOI	10.30919/ee1426

13

Title	UNDERSTANDING THE CONTRIBUTION OF TURKIC PETROGLYPHS TO CULTURAL TOURISM DEVELOPMENT IN CENTRAL ASIA: A SYSTEMATIC AND META-ANALYTIC PERSPECTIVE
Authors	Issakov, Y.| Zhoya, K.| Nizamatdinova, Z.| Laiskhanov, S.| Aliaskarov, D.| Gajić, T.
Year	2025
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-105020033509&origin=resultslist
DOI	10.30892/gtg.62406-1572

14

Title	Development of an optoelectronic system for recording and processing signals from fiber-optic sensors
Authors	Kalizhanova, A.| Kozbakova, A.| Kunelbayev, M.| Aitkulov, Z.
Year	2023
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85182183933&origin=resultslist
DOI	10.46300/9104.2023.17.13

15

Title	Mathematical Modeling to Estimate the Diffusion of Traffic-Related Air Pollutants in Almaty City
Authors	Pirniazova, P.| Koshanova, D.
Year	2023
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85171970852&origin=resultslist
DOI	10.1109/SIST58284.2023.10223576

16

Title	Teachers' views on teaching modern Kazakh stories over national values
Authors	Zhanat, A.| Kunimzhan, A.| Aigul, A.| Agabekkyzy, B.R.| Nurziya, A.
Year	2022
Abstract in Scopus	https://www.scopus.com/record/display.url?eid=2-s2.0-85124658296&origin=resultslist
DOI	10.18844/cjes.v17i1.6702