

Project name: IRN №AP09259657 "Research and development of an automated proctoring system for monitoring students' knowledge in the context of distance learning".

Relevance: Today, the defining task of universities is to train specialists who are able to constantly improve their knowledge and skills, who are able to quickly navigate the growing flow of information and make decisions in non-standard situations. The possibility of obtaining mass, affordable education opens up when implementing distance learning. However, shortcomings in the systematic organization of the distance learning process, the lack of clear regulated control procedures often lead to a decrease in the quality of student training, cause a negative attitude to distance education in general. This problem dictates the need for each university implementing distance learning to solve a set of tasks to create a system for evaluating the quality of education.

In this regard, it becomes relevant to study innovative technologies in the organization of the educational process, namely, the control of students' knowledge based on information and communication technologies in the context of distance learning.

Goal: The aim of the project is to research and develop an automated proctoring system for monitoring students' knowledge in the context of distance learning.

Expected results:

- scientific and methodological bases of the organization of the educational process with the use of distance learning technologies in universities will be developed;
- structural and logical schemes for monitoring and evaluating the results of students' educational activities will be prepared;
- algorithms and models of face image recognition will be built;
- algorithms and models of visual image recognition will be developed;
- speech recognition algorithms and models will be developed;
- a software product of the proctoring system will be developed;
- reports on testing the software product of the proctoring system will be executed;
- reports on the trial operation of the software product will be performed;
- technical documentation will be developed.

Members of the research group:

имена и фамилии членов исследовательской группы с их идентификаторами (Scopus Author ID, Researcher ID, ORCID, если имеются) и ссылками на соответствующие профили

1. Scientific supervisor – **Zulpykhar Zhandos Yensebekuly**, candidate of pedagogical Sciences, head of the Department of Informatics of the L.N.

- Gumilev Eurasian National University (<https://orcid.org/0000-0001-7086-3766>, ResearcherID P-6581-2014);
2. Co-head - **Shaushenova Anargul Gimranovna** - candidate of technical Sciences, head of the Department of information systems, Kazakh agrotechnical University named after S. Seifullin (<https://orcid.org/0000-0002-3164-3688>, Researcher ID AAY-3253-2020, Scopus Author ID - 57863745200);
 3. Chief researcher – **Nurpeisova Ardak Aldanyshovna** - PhD, senior lecturer of the Department of information systems, Kazakh agrotechnical University named after S. Seifullin (<https://orcid.org/0000-0002-1245-8313>, Researcher ID AAV-3919-2020, Scopus Author ID – 57220128907);
 4. Senior researcher - **Ongarbayeva Maral Burkitbaevna** - candidate of pedagogical Sciences, head of the Department of Information and communication technologies of Taraz University of innovation and Humanities (<https://orcid.org/0000-0003-0698-666X>);
 5. Researcher - **Nurzhanov Kuanysh Zhankeldinuly** - IE EX Development Group, director;
 6. Researcher - **Orazbayeva Balausa Abduvalievna** – engineer of the Department of Informatics of the L. N. Gumilyov Eurasian national University;
 7. Researcher – **Zhumasseitova Samal Duisebaevna** – senior lecturer of the Department "Information and communication technology" Kazakh agro technical University S. Seifullin (<https://orcid.org/0000-0001-8210-5022>).

List of publications and patents published within the framework of this project: (with links to them):

3 articles have been prepared and published, which are part of the unified bibliographic and abstract database of peer-reviewed scientific literature Scopus, Web of Science:

1. Nurpeisova, A.; Shaushenova, A.; Mutalova, Z.; Zulpykhar, Z.; Ongarbayeva, M.; Niyazbekova, S.; Semenov, A.; Maisigova, L. The Study of Mathematical Models and Algorithms for Face Recognition in Images Using Python in Proctoring System. *Computation* 2022, 10, 136. <https://doi.org/10.3390/computation10080136> (Scopus, 70 процентиљ, CiteScore 2021= 3.3, SJR 2021=0.389; Web of Science Q2, JCI 2021=0,7)
2. Shaushenova, A., Zulpykhar, Zh., Zhumasseitova, S., Ongarbayeva, M., Akhmetzhanova, Sh, Mutalova, Zh, Niyazbekova, Sh, Zueva, A. The Influence of the Proctoring System on the Results of Online Tests in the Conditions of Distance Learning. *AD ALTA. Journal of Interdisciplinary Research*. Vol. 11, issue 2. <https://doi.org/10.33543/1102> (Web of Science Q3, JCI 2021=0,14)
3. Nurpeisova A., Shaushenova A., Yessymkhanova Z. Features of Proctoring Financial Market Disciplines. *European Proceedings of Finance and Economics* (in print)

5 articles have been published in journals included in the RSCI database:

1. Шаушенова А.Г., Жумасеитова С.Д., Онгарбаева М.Б. Методические основы контроля знаний студентов в системе дистанционного обучения. Вопросы устойчивого развития общества. №9, 2021 г. стр. 206-211 URL: <http://www.nauka20-35.ru>

2. Шаушенова А.Г., Жумасеитова С.Д., Ахметжанова Ш.Е. Особенности современных биометрических методов идентификации. Вопросы устойчивого развития общества. №9, 2021 г. стр. 212-224 URL: <http://www.nauka20-35.ru>

3. Зулпыхар Ж.Е., Шындалиев Н.Т. Методические основы организации учебного процесса с использованием дистанционных технологий обучения в ВУЗах. Инновации. Наука. Образование. №40, 2021 г. стр. 660-664 <https://drive.google.com/file/d/1q3ni4XeYGOhFdKOUipkVV94qrOg6fxra/view>

4. Nurpeisova A., Shaushenova A., Dosalyanov D.B., Olzhabayeva R.Zh. About some aspects of facial recognition technology. Сборник материалов XI международной научно-практической конференции «Вызовы современности и стратегии развития общества в условиях новой реальности» г. Москва 25 октября 2022 года. <https://doi.org/10.34755/IROK.2022.40.69.064>

5. Nurpeisova A., Shaushenova A., Dosalyanov D.B., Olzhabayeva R.Zh. Development and future trends of facial recognition. Сборник материалов XI международной научно-практической конференции «Вызовы современности и стратегии развития общества в условиях новой реальности» г. Москва 25 октября 2022 года. <https://doi.org/10.34755/IROK.2022.40.69.064>

5 articles have been prepared in journals recommended by the CCSON:

1. Shaushenova A.G., Akhmetzhanova M.B., Ongarbayeva M.B. Comparison of Russian and Kazakhstan proctoring systems. Bulletin of the Karaganda University. №4- 2021. p. 83-91. <https://doi.org/10.31489/2021Ped4/83-91>

2. Зулпыхар Ж.Е., Шындалиев Н.Т., Оразбаева Б.А. Қашықтықтан оқыту кезіндегі білімгерлердің сынақ емтихандарында қолданылатын бағдарламаларды талдау. Л.Н. Гумилев атындағы Еуразия ұлттық университетінің Хабаршысы. №4- 2021. р. 115-122. URL: <https://bulpedps.enu.kz/article/archive/series?number=137>

3. Шаушенова А.Г., Нурпейсова А.А., Муталова Ж.С., Досалянов Д.Б., Онгарбаева М.Б. Особенности зарубежных систем видеомониторинга и идентификации обучающегося в дистанционном обучении. Известия НАН РК. Серия Физика и Информатика. №3, 2022. https://doi.org/10.32014_2518-1726_2022_343_3_247-259

4. Зулпыхар Ж.Е., Оразбаева Б.А. Қашықтан оқыту жағдайында білім алушыларды идентификациялау және тану технологиялары. Л.Н. Гумилев ат. ЕҰУ Хабаршысы №3, 2022 <https://doi.org/10.32523/2616-6895-2022-140-3-401-411>

5. Шаушенова А.Г., Нурпейсова А.А., Досалянов Д.Б., Мауина Г.М. Прокторинг автоматтандырылған жүйесінде сөйлеуді танудың нейрондық

желілері. ҚР ҰҒА Хабарлары. Физика және Информатика сериясы. №4, 2022.
<https://doi.org/10.32014/2022.2518-1726.163>

Information for potential users:

The developed scientific and methodological basis for the organization of the educational process in distance learning and a software product for taking online exams is applicable for all universities of the Republic of Kazakhstan.