



jild. 3 No 2 (2026)

**MANAGEMENT AND ECONOMICS
SCIENTIFIC RESEARCH JOURNAL**

**MENEJMENT VA IQTISODIYOT
ILMIY-TADQIQOT JURNALI**

**НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ
ЖУРНАЛ МЕНЕДЖМЕНТА И ЭКОНОМИКИ**



journals@timeedu.uz



+998 95 651 90 00

O'ZBEKISTON RESPUBLIKASI
OLIY TA'LIM, FAN VA INNOVATSIYALAR VAZIRLIGI
TOSHKENT MENEJMENT VA IQTISODIYOT INSTITUTI



**“MUHANDISLIKDA SUN'IY INTELLEKT VA
RAQAMLI INNOVATSION
TEKNOLOGIYALAR: ZAMONAVIY
YECHIMLAR VA ISTIQBOLLAR”
MAVZUSIDAGI
XALQARO ILMIY-AMALIY ANJUMAN
MATERIALLARI**



FARG'ONA-2026

O'ZBEKISTON RESPUBLIKASI OLIIY TA'LIM, FAN VA INNOVATSIYALAR VAZIRLIGI

TOSHKENT MENEJMENT VA IQTISODIYOT INSTITUTI

"MUHANDISLIKDA SUN'IY INTELLEKT VA RAQAMLI INNOVATSION TEXNOLOGIYALAR:

ZAMONAVIY YECHIMLAR VA ISTIQBOLLAR" MAVZUSIDAGI

XALQARO ILMIY-AMALIY ANJUMAN MATERIALLARI

21 MAY 2026 YIL



МИНИСТЕРСТВО ВЫСШЕГО ОБРАЗОВАНИЯ, НАУКИ И ИННОВАЦИЙ РЕСПУБЛИКИ

УЗБЕКИСТАН

ТАШКЕНТСКИЙ ИНСТИТУТ УПРАВЛЕНИЯ И ЭКОНОМИКИ

МЕЖДУНАРОДНАЯ НАУЧНО-ПРАКТИЧЕСКАЯ КОНФЕРЕНЦИЯ НА ТЕМУ

«ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ И ЦИФРОВЫЕ ИННОВАЦИОННЫЕ ТЕХНОЛОГИИ В

ИНЖЕНЕРИИ: СОВРЕМЕННЫЕ РЕШЕНИЯ И ПЕРСПЕКТИВЫ»

21 МАЯ 2026 ГОДА



MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATIONS OF THE REPUBLIC OF

UZBEKISTAN

TASHKENT INSTITUTE OF MANAGEMENT AND ECONOMICS

INTERNATIONAL SCIENTIFIC AND PRACTICAL CONFERENCE ON THE THEME "ARTIFICIAL

INTELLIGENCE AND DIGITAL INNOVATIVE TECHNOLOGIES IN ENGINEERING: MODERN

SOLUTIONS AND PROSPECTS" 21 MAY 2026

“Muhandislikda sun’iy intellekt va raqamli innovatsion texnologiyalar: zamonaviy yechimlar va istiqbollar” Xalqaro ilmiy-amaliy anjuman tezislar to‘plami. 2026-yil 21-may.

Ushbu to‘plamda — “Muhandislikda sun’iy intellekt va raqamli innovatsion texnologiyalar: zamonaviy yechimlar va istiqbollar” Xalqaro ilmiy –amaliy anjuman ishtirokchilarining tezislari keltirilgan. Anjuman kun tartibiga kiritilgan masalalar dolzarb bo‘lib, u yalpi ma’ruzalar va amaliy zamonaviy muhandislik ta’limida raqamli transformatsiya va sun’iy intellekt, muhandislik yechimlari va sanoat 4.0, robototexnika va avtomatlashtirilgan boshqaruv tizimlari, kiberxavfsizlik va ma'lumotlarni himoya qilish, ta’limda axborot va innovatsion texnologiyalarning qo‘llanilishi, biznes jarayonlar va raqamli iqtisodiyotga axborot texnologiyalarining o‘rni kabi sho‘balardan tashkil topgan. To‘plam sohasi mutaxassislari, ilmiy tadqiqotchilar, professor-o‘qituvchilar, doktorantlar, magistrlar va talabalar uchun mo‘ljallangan.

Maqolalarda keltirilgan ma’lumotlarning haqqoniyligi uchun mualliflar mas’uldir.

©Xalqaro ilmiy-amaliy anjuman tezislar to‘plami



☎ +998 95 651 90 00

✉ journals@timeedu.uz

📍 Shota Rustaveli ko'chasi, 114

🌐 tmijournals.ndc-agency.uz

✈ TMII_ilmiy_bolim

Tahririyat jamoasi

BOSH MUHARRIR:

Narbayev Sharafatdin Kengeshovich

BOSH MUHARRIR O'RINBOSARI:

Norbekov Shohzod Mamarasul o'g'li

TAHRIR HAY'ATI

1. Sharipov Qo'ngratbay Avezimbetovich — O'zbekiston Respublikasi Oliy ta'lim, fan va innovatsiyalar vaziri, tfd, professor.
2. Axmedov Xojiakbarxon Dilshatovich — Toshkent menejment va iqtisodiyot instituti rektori, ifn, dotsent.
3. Gulyamov Saidasror Saidaxmedovich — O'zbekiston Fanlar akademiyasi akademiyasi, ifd, professor.
4. Xotamov Ibodullo Sadulloyevich — Toshkent menejment va iqtisodiyot instituti Iqtisodiyot kafedrası professori, ifn.
5. Sultonov Mansur Qilichovich — O'zbekiston Respublikasi Prezidenti Administratsiyasi huzuridagi Ta'lim sifatini ta'minlash milliy agentligi ekspertlar guruhi rahbari, tffd, dotsent.
6. Chertovitskiy Aleksandr Stepanovich — "Toshkent irrigatsiya va qishloq xo'jaligini mexanizatsiyalash muhandislari instituti" Milliy tadqiqot universiteti professori, iqtisodiyot fanlari doktori.
7. Popkova Yelenadyevna — Rossiya Gen "Ilmiy aloqalar instituti" avtonom notijorat tashkiloti prezidenti, iqtisodiyot fanlari doktori, professor.
8. Dr Go Khang Ven — Malayziyaning INTI xalqaro universiteti prorektori.
9. Wang Cheng — XXR "Hebei Institute of Mechanical and Electrical Technology" instituti iffd, dotsent.
10. Xakimova Nilufar Karimkulovna — O'zMU huzuridagi Yarimo'tkazgichlar fizikasi va mikroelektronika ilmiy-tadqiqot instituti PhD, ilmiy xodimi.
11. Yo'ldoshev Nuriddin Qurbonovich — Toshkent menejment va iqtisodiyot instituti Biznes boshqaruvi va moliya kafedrası ifd, professor.
12. Chariyev Qurbon Amirovich — Toshkent menejment va iqtisodiyot instituti Iqtisodiyot kafedrası professori, ifd.
13. Abduraimova Nigora Radjabovna — Toshkent menejment va iqtisodiyot instituti Iqtisodiyot kafedrası dotsenti, iffd.
14. Anarqulova Gulnaz Mirzaxmatovna — Toshkent menejment va iqtisodiyot instituti Ijtimoiy-gumanitar fanlar kafedrası professori, ifn.
15. Yakubov Sadirjan Bakiyevich — Toshkent menejment va iqtisodiyot instituti Ijtimoiy-gumanitar fanlar kafedrası professori, ifn.
16. Kadirova Istora Bobirovna — Toshkent menejment va iqtisodiyot instituti Karyera markazi direktori, iffd, dotsent.
17. Nosirova Nargiza Jamoliddin qizi — Toshkent davlat iqtisodiyot universiteti doktoranti, iffd, dotsent.
18. Mamatov Narzullo Solidjonovich — "TIQXMMI" MTU kafedra mudiri, texnika fanlari doktori, professor.
19. Turaqulov Otabek Xolmirzayevich — Toshkent menejment va iqtisodiyot instituti Muhandislik va axborot texnologiyalari kafedrası mudiri, tffd, dotsent.
20. Toirov Shuxrat Abduganiyevich — Toshkent menejment va iqtisodiyot instituti Muhandislik va axborot texnologiyalari kafedrası professori vb, tffd.
21. Yusupov Rustam Abdimuratovich — Toshkent menejment va iqtisodiyot instituti Muhandislik va axborot texnologiyalari kafedrası dotsenti, tffd.
22. Nazarov Xolmo'min Abduxobovich — Toshkent menejment va iqtisodiyot instituti Muhandislik va axborot texnologiyalari kafedrası dotsenti, fmf.
23. Asrayev Muhammadmullo Abdulla o'g'li — Toshkent menejment va iqtisodiyot instituti Muhandislik va axborot texnologiyalari kafedrası dotsenti, tffd.
24. Yunusova Shaxnoza Muxamedumarovna — Toshkent menejment va iqtisodiyot instituti Ijtimoiy-gumanitar fanlar kafedrası dotsenti, fffd.

TOWARDS TRUSTWORTHY WILDFIRE DETECTION: INTEGRATING EXPLAINABILITY AND UNCERTAINTY IN DEEP LEARNING MODELS

Khidirova Dilrabo Rasuljon qizi

Independent AI Research & Applied Machine Learning

e-mail: dilrabo.khidirova91@gmail.com

Abstract. Wildfires are now a climate-driven, year-round hazard, raising the value of deep learning for early visual detection. This study presents BlazeVeritas AI, a wildfire detection framework integrating CNN, ResNet-18 [8], and DenseNet-121 [5] with Grad-CAM [7] explainability and uncertainty calibration via Monte Carlo Dropout [9] and Temperature Scaling, deployed through FastAPI and Streamlit. Results show that pairing explanation with calibrated uncertainty improves the reliability of wildfire decision-support systems.

Keywords: *trustworthy artificial intelligence; wildfire detection; Grad-CAM; uncertainty calibration; deep learning.*

Аннотация. Лесные пожары стали круглогодичной, усиливаемой климатом угрозой, что повышает роль глубокого обучения для их раннего визуального обнаружения. В статье представлена система BlazeVeritas AI, объединяющая CNN, ResNet-18 и DenseNet-121 с объяснимостью Grad-CAM и оценкой неопределённости на основе Monte Carlo Dropout и Temperature Scaling, реализованная средствами FastAPI и Streamlit. Результаты показывают, что совместное применение объяснимости и калиброванной неопределённости повышает надёжность систем поддержки принятия решений.

Ключевые слова: *доверенный искусственный интеллект; обнаружение лесных пожаров; Grad-CAM; калибровка неопределённости; глубокое обучение.*

Annotatsiya. Yong'inlar iqlim o'zgarishi ta'sirida yil davomida davom etadigan tahdidga aylangan bo'lib, bu ularni erta aniqlashda chuqur o'rganishning ahamiyatini oshiradi. Maqolada CNN, ResNet-18 va DenseNet-121 modellarini Grad-CAM tushuntirish mexanizmi hamda Monte Carlo Dropout va Temperature Scaling asosidagi noaniqlik bahosi bilan birlashtiruvchi BlazeVeritas AI tizimi taqdim etiladi. Tizim FastAPI va Streamlit yordamida ishlab chiqilgan. Natijalar tushuntiruvchanlik va noaniqlikni birga qo'llash qaror qabul qilish ishonchliligini oshirishini ko'rsatadi.

Kalit so'zlar: ishonchli sun'iy intellekt; yong'inni aniqlash; Grad-CAM; noaniqlikni kalibrlash; chuqur o'rganish.

1. Introduction

Wildfires have shifted from seasonal hazards into year-round, climate-driven emergencies that routinely overwhelm conventional surveillance watch towers, slow satellites, and citizen reports. Computer vision over fixed cameras, drones, and edge sensors narrows that gap, flagging ignitions in seconds rather than minutes [1], and modern CNNs now rival human reviewers on benchmark accuracy [2]. Yet accuracy is a weak proxy for operational readiness: deep models behave as black boxes and are systematically overconfident, often claiming 99% certainty on inputs they get right only 80% of the time [3]. Where false alarms erode vigilance and missed detections cost lives, that pairing is corrosive.

This study therefore asks not how to raise accuracy but under what conditions a wildfire classifier can be trusted. Trust is treated as the conjunction of two signals — explainability through Grad-CAM, which reveals where the model looked, and uncertainty through Monte Carlo (MC) Dropout with Temperature Scaling, which indicates how far the output can be believed. The contributions are threefold: (i) BlazeVeritas AI, an end-to-end FastAPI/Streamlit pipeline returning prediction, explanation, and calibrated uncertainty as one payload; (ii) a benchmark of a custom CNN, ResNet-18, and DenseNet-121 on accuracy, Expected Calibration Error (ECE), and explanation–evidence alignment; and (iii) a decision-support framing in which uncertainty thresholds route ambiguous inputs to human review.

2. Literature Review

Vision-based fire detection has passed through three waves. Early systems paired hand-crafted colour and motion descriptors chromatic thresholds in the red–yellow band, flicker analysis, optical flow on smoke with Support Vector Machines, but generalized poorly across illumination and camera variation [4]. Shallow CNNs trained on small fire databases then outperformed those baselines despite scarce data [4], and the current wave of ImageNet-pretrained ResNet, DenseNet, EfficientNet, and Vision Transformer backbones reports accuracies above 95% on standard benchmarks [5].

This progress, however, exposed a parallel deficit in trustworthiness. Guo et al. [3] showed that the architectures whose accuracy would justify deployment are also the most poorly calibrated; in safety-critical vision this drove a literature on post-hoc calibration, where Temperature Scaling proved the simplest effective remedy [3]. Bayesian alternatives notably MC Dropout [6] decompose

uncertainty into epistemic and aleatoric components and track empirical error well [6,9]. The explainable-AI toolbox expanded in parallel: Grad-CAM [7] localizes class-discriminative regions without architectural change, while LIME and SHAP add model-agnostic alternatives with different fidelity–interpretability trade-offs [7]. Within wildfire research, explanation has surfaced dataset biases and made model attention legible to non-specialist operators [1]. Even so, explanation, uncertainty, and deployment remain fragmented in the literature usually relegated to ablations rather than woven into the operator-facing path.

3. Materials and Methods

3.1. Dataset and model architectures

The study uses a publicly aggregated wildfire image corpus with binary fire/no-fire labels, spanning varied scenes, backgrounds, and viewpoints to discourage scene-specific memorization. The data are split 70/15/15 (train/validation/test) by stratified sampling, resized to 224×224, normalized with ImageNet statistics, and augmented with random flip, ±15° rotation, brightness/contrast jitter, and random erasing. Three models are trained under one protocol: a Custom CNN of four convolutional blocks (32→64→128→256 channels) with batch normalization, max pooling, dropout ($p = 0.5$), and a sigmoid head; and ResNet-18 and DenseNet-121, both ImageNet-pretrained with a binary head and fine-tuned at a reduced learning rate. Training uses Adam, binary cross-entropy loss, and early stopping; dropout stays active at inference, so MC Dropout needs no retraining.

3.3. Explainability and uncertainty estimation

Grad-CAM is anchored to the final convolutional block of each network, fusing its feature maps with the back-propagated gradients of the target-class score; the layer is an empirical compromise, since anchoring deeper sharpened flame localization but blurred diffuse smoke. Uncertainty is then estimated in two stages. MC Dropout [6] performs $T = 30$ stochastic forward passes per input with dropout active; the predictive mean and standard deviation σ give the point estimate and the epistemic-uncertainty proxy:

$$\mu = (1/T) \sum p_t, \quad \sigma = std(p_t) \quad (1)$$

A high σ means the output depends heavily on which weights are silenced a sign that the input lies in an under-represented region of the data manifold. Temperature Scaling [3] handles the complementary problem of systematic overconfidence: the frozen network's pre-sigmoid logits are divided by a single fitted scalar $T > 0$ that minimizes negative log-likelihood on the validation set. Because the argmax is preserved, accuracy is unchanged while calibration sharpens.

3.4. Deployment and evaluation

The models, the Grad-CAM module, and the uncertainty pipeline are wrapped in a FastAPI service whose /predict endpoint returns the predicted class, the calibrated probability, the MC σ , and a base64-encoded Grad-CAM overlay. A Streamlit dashboard renders each image with its overlay and uncertainty band and colour-codes the response as confirmed fire, confirmed no-fire, or review required against a user-set σ threshold (Figure 1). Evaluation reports accuracy, precision, recall, and F1, plus Expected and Maximum Calibration Error (ECE, MCE) before and after temperature scaling over fifteen equal-width probability bins [9]. Selective Prediction Accuracy is measured at 100/90/80/70% retention, and Grad-CAM quality is judged qualitatively on a stratified sample of correct, false-positive, and false-negative cases, cross-referenced against σ .

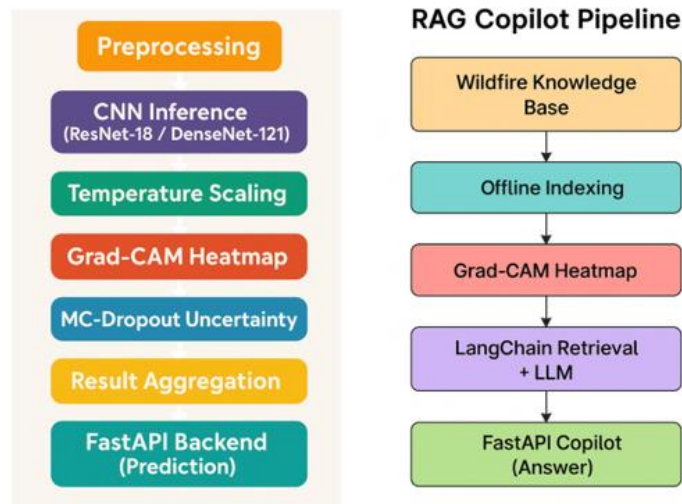


Figure 1. BlazeVeritas AI system architecture and end-to-end workflow.

4. Results and Discussion

4.1. Classification and calibration

Table 1 reports the test-set metrics. ResNet-18 attains the highest accuracy and F1, marginally ahead of DenseNet-121, and both pretrained backbones clearly outperform the Custom CNN confirming the value of transfer learning at moderate label volume. Calibration tells a different story: in raw form all three models are overconfident, the Custom CNN worst (ECE 0.072) and DenseNet-121 best (0.058), with the widest confidence–accuracy gaps in the highest-probability bins. After temperature scaling on the validation set, ECE falls three- to fivefold to 0.018, 0.014, and 0.012 respectively and reliability curves approach the diagonal. The fitted temperatures (≈ 1.6 for the CNN, 1.4 for ResNet-18, 1.3 for DenseNet-121) indicate that deeper, denser networks start slightly better calibrated, consistent with implicit architectural regularization, yet still gain

from the correction. The predicted class is unchanged for every instance, so the trustworthiness gain costs no accuracy.

Table 1. Test-set classification and calibration metrics for the three architectures.

Model	Accuracy	Precision	Recall	F1	ECE (raw)	ECE (TS)
Custom CNN	0.971	0.989	0.961	0.975	0.072	0.018
ResNet-18	0.999	1.000	1.000	1.000	0.063	0.014
DenseNet-121	0.995	1.000	0.991	0.995	0.058	0.012

4.2. Uncertainty as a deferral signal

MC Dropout σ correlates strongly with classification error: across all three models the median σ on misclassified images is roughly three times that on correctly classified ones. Selective-prediction analysis shows that deferring the 20% most uncertain cases to a human reviewer raises retained-set accuracy by several percentage points, with the largest absolute gain on the Custom CNN the model with the noisiest baseline confidence. Because uncertain predictions are disproportionately wrong, σ becomes an inexpensive, actionable triage signal, and its threshold a tunable knob trading automation throughput against false-alarm rate.

4.3. Explanation quality and decision support

On correctly classified fire images, Grad-CAM reliably settles on the flame core or the dense base of the smoke plume, confirming that the network reads physically meaningful evidence. False positives tell the opposite story: the overlays drift onto sunset clouds, red-roofed buildings, or industrial steam the same spurious cues that defeated handcrafted-feature systems [4] so hidden failure modes become visible at inference time. False negatives cluster on diffuse smoke against bright skies, where the heatmap is flat and σ is elevated; explanation and uncertainty thus reinforce one another (Figure 2). This turns detection into a decision-support task. A bare probability of 0.93 means little, but the same value with a heatmap on a plume and $\sigma = 0.04$ is actionable, whereas 0.93 with $\sigma = 0.18$ and attention on the sky warrants escalation. Even a conservative σ threshold preserves over 80% of throughput while sharpening the precision of auto-confirmed alerts.

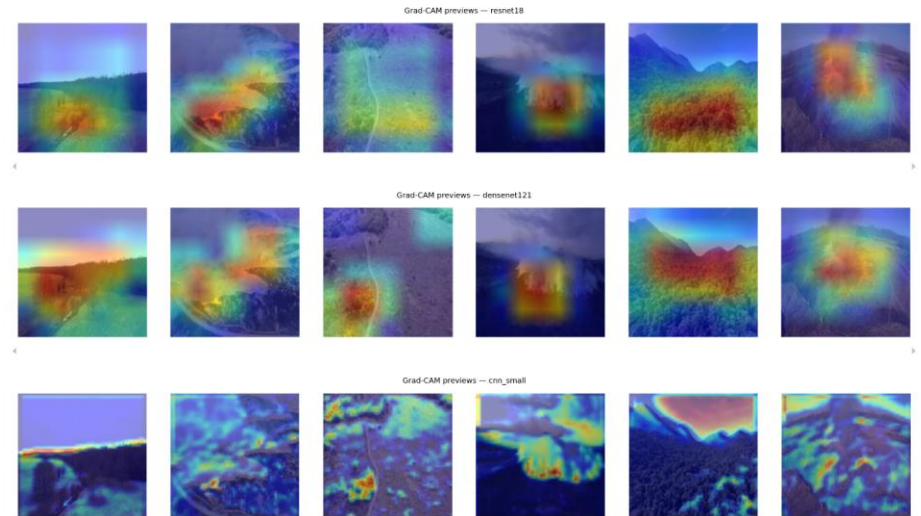


Figure 2. Grad-CAM attention maps across the three models (ResNet-18, DenseNet-121, and the Custom CNN) on representative fire and no-fire images. The pretrained backbones concentrate on flame and smoke regions, whereas the Custom CNN produces diffuse, less focused activations.

5. Conclusion and Future Work

This study has argued that the binding constraint on deploying AI-based wildfire detection is not raw accuracy but trustworthiness, and has presented BlazeVeritas AI as a concrete response: three deep architectures, Grad-CAM explanations, and a calibrated uncertainty pipeline pairing MC Dropout with Temperature Scaling, delivered through a FastAPI/Streamlit stack that treats transparency and calibrated doubt as first-class outputs. Empirically, temperature scaling cuts calibration error three- to fivefold, MC Dropout σ flags misclassifications for review, and Grad-CAM exposes the spurious cues behind residual errors. The novelty lies not in any single technique each is individually established but in their integration into a deployment-ready, decision-support framing. Future work will proceed along three lines: field deployment on operational camera streams to measure domain shift and guide online recalibration; replacing MC Dropout with deep ensembles tighter uncertainty bounds; and extending from binary to multi-class outputs that separate flame, smoke, and false-trigger categories such as steam or sunset glare.

Practical and Theoretical Recommendations

Three recommendations follow from the analysis. (i) Wildfire detectors intended for operational use should be evaluated on calibration metrics Expected and Maximum Calibration Error alongside accuracy and F1, since accuracy alone hides the overconfidence pathology that erodes real-world trust. (ii) Explanation maps and uncertainty estimates should ship as part of the standard inference payload rather than as optional diagnostics, because their

joint availability enables triage rules that no single signal can support. (iii) Procurement and certification frameworks for environmental-monitoring AI should require deployable, audit-ready pipelines in which transparency and calibrated doubt are first-class outputs, aligning practice with emerging regulatory expectations for trustworthy artificial intelligence.

References

1. Jain P., Coogan S. C. P., Subramanian S. G., Crowley M., Taylor S., Flannigan M. D. A review of machine learning applications in wildfire science and management. *Environmental Reviews*, 2020, vol. 28, no. 4, pp. 478–505.
2. Khan S., Khan A., Maqsood M., Aadil F., Ghazanfar M. A. Convolutional neural networks for fire and smoke detection: A comprehensive survey. *Multimedia Tools and Applications*, 2022, vol. 81, no. 24, pp. 35143–35180.
3. Guo C., Pleiss G., Sun Y., Weinberger K. Q. On Calibration of Modern Neural Networks. *Proceedings of the 34th International Conference on Machine Learning (ICML)*, 2017, pp. 1321–1330.
4. Frizzi S., Kaabi R., Bouchouicha M., Ginoux J.-M., Moreau E., Fnaiech F. Convolutional neural network for video fire and smoke detection. *Proceedings of the 42nd Annual Conference of the IEEE Industrial Electronics Society (IECON)*, 2016, pp. 877–882.
5. Park M., Tran D. Q., Jung D., Park S. Wildfire-Detection Method Using DenseNet and CycleGAN Data Augmentation-Based Remote Camera Imagery. *Remote Sensing*, 2020, vol. 12, no. 22, art. 3715.
6. Gal Y., Ghahramani Z. Dropout as a Bayesian Approximation: Representing Model Uncertainty in Deep Learning. *Proceedings of the 33rd International Conference on Machine Learning (ICML)*, 2016, pp. 1050–1059.
7. Selvaraju R. R., Cogswell M., Das A., Vedantam R., Parikh D., Batra D. Grad-CAM: Visual Explanations from Deep Networks via Gradient-Based Localization. *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*, 2017, pp. 618–626.
8. He K., Zhang X., Ren S., Sun J. Deep Residual Learning for Image Recognition. *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016, pp. 770–778.
9. Naeini M. P., Cooper G. F., Hauskrecht M. Obtaining Well Calibrated Probabilities Using Bayesian Binning. *Proceedings of the 29th AAAI Conference on Artificial Intelligence*, 2015, pp. 2901–2907.

MUNDARIJA		
1-SHO'BA: ZAMONAVIY MUHANDISLIK TA'LIMIDA RAQAMLI TRANSFORMATSIYA VA SUN'IY INTELLEKT		6
<i>Turakulov O Asrayev M Karimov E</i>	QISHLOQ VRACHLIK PUNKTLARINING SAMARADORLIGINI OSHIRISHDA AXBOROT TEXNOLOGIYALARINING RO'LI	6
<i>G'oiipova Kh</i>	VOICE ANALYSIS TECHNOLOGIES SPECIAL ALGORITHMS AND ARTIFICIAL INTELLECT MODELS	11
<i>G'oiipova Kh</i>	SECURITY MECHANISMS BASED ON VOICE AND VIDEO SYNTHESIS	17
<i>Sh.A.Toirov, T.E.Xudoyqulov</i>	METHODS AND SOLUTIONS FOR GENERALIZING AMPLITUDE AMPLIFICATION IN QUANTUM ALGORITHMS	23
<i>Rizayev X</i>	MUHANDISLIK GRAFIKASI FANLARINI O'QITISHDA AUTOCAD DASTURIDAN BIM TEXNOLOGIYALARIGA ASOSLANGAN REVIT DASTURIGA O'TISHNING DIDAKTIK AFZALLIKLARI	27
<i>Turakulova Sh</i>	KO'Z TUBI TASVIRLARIDA QON TOMIR TARMOQLARINING DIAMETRI, EGRI-BUGRILIGI VA TARMOQLANISH BURCHAKLARI ASOSIDA DIAGNOSTIK TAHLIL	34
<i>Turakulov O, Jumaboyev D</i>	IJTIMOIIY TARMOQ YOZISHMALARIDAGI HISSIYOTLARNI TAHLILLASH MODELII	45
<i>X.T. Dusanov</i>	SUN'IY INTELLEKT ALGORITMLARI ASOSIDA TASVIRLAR SIFATINI OSHIRISH	49
<i>Yusupov R.A.</i>	YER OSTI SUVLARI GIDROSFERASI HARAKATINI SUN'IY INTELLEKT YORDAMIDA MODELLASHTIRISH	56
<i>Erhanova N</i>	BOLALARNING NUTQINI O'STIRISH ORQALI TANQIDIY FIKRLASHGA O'RGATISHDA SUN'IY INTELLEKTDAN FOYDALANISH	64
<i>S.A. Olimov</i>	TA'LIM TIZIMIGA SUN'IY INTELLEKT TEXNOLOGIYALARINI TATBIQ ETISH JIHATLARI	70
<i>Shadmanov S</i>	SUN'IY INTELLEKTNING ZAMONAVIY TENDENSIYALARI	77
2-SHO'BA: MUHANDISLIK YECHIMLARI VA SANOAT 4.0		82
<i>Норматов Ш, Туражонов К,</i>	МЕТОД ОЦЕНКИ УСТОЙЧИВОСТИ ОТКОСОВ И УСТУПОВ КАРЬЕРА	82

Логинов П, Акбаров Н		
Егорова В.В.	ЖИВУЧЕСТЬ И ТЕХНИЧЕСКОЕ СОСТОЯНИЕ ЖЕЛЕЗОБЕТОННЫХ КОНСТРУКЦИЙ КАРКАСА ЗДАНИЯ В РЕЗУЛЬТАТЕ ОСОБОГО ВОЗДЕЙСТВИЯ	89
Ochilova I	O'ZBEKISTON SANOAT KORXONALARIDA GENDER TENGLIK INDIKATORLARINI RAQAMLI MONITORING QILISH MEXANIZMLARI	104
Axmedov X, Sharipov K	KORXONALARNING RAQOBATBARDOSHLIGINI TA'MINLASH STRATEGIYASINI ISHLAB CHIQISHDA ZAMONAVIY TAHLIL METODLARINING AHAMIYATI	109
Khidirova D	TOWARDS TRUSTWORTHY WILDFIRE DETECTION: INTEGRATING EXPLAINABILITY AND UNCERTAINTY IN DEEP LEARNING MODELS	113
Axmedov X, Sharipov K	RAQOBAT STRATEGIYASINI ISHLAB CHIQISH ASOSIDA KORXONANI STRATEGIK BOSHQARISH TIZIMINI TAKOMILLASHTIRISH	120
Narbayev Sh, Abduqayumov A	DAVLAT KORXONALARIDA ESG STANDARTLARI ASOSIDA KORPORATIV BOSHQARUV TIZIMINI TAKOMILLASHTIRISH	126
Omonturdiyev O	SIFATLI NOTO'QIMA MATO OLISH UCHUN JUN TOLASINI CHO'TKALI BARABAN ORQALI SAMARALI TOZALASH VA UZATISH JARAYONINING NAZARIY TAHLILI	132
Rashidov J.X., Kaipov A. K	IQTISODIY MODERNIZATSIYA JARAYONIDA ISHLAB CHIQARISH SAMARADORLIGINI RIVOJLANTIRISHNING ASOSIY OMILLARI	143
Rashidov J.X., Kaipov A. K	IQTISODIYOTNI MODERNIZATSIYA VA DIVERSIFIKATSIYA QILISH JARAYONIDA KORXONALARDAGI MOLIVAVIY XAVFLARNI BOSHQARISH MEXANIZMLARI	147
Kadirjanova M	KORXONALARDA INNOVATSION RIVOJLANISHNI BOSHQARISH STRATEGIYALARINI TAKOMILLASHTIRISH	158
Kadirjanova M	KORXONALARDA INNOVATSION BOSHQARISH TIZIMINI TAKOMILLASHTIRISH.	166

<i>R.M. Tursunova, M.E. Tursunov, G. Abduraxmanov, A.T. Dexqonov, Sh.M. Norbekov, D.R. Jumaboyev</i>	LEGIRLANGAN SILIKAT SHISHASIDA SIZIB O'TISH BUSAG'ASIGA TEXNOLOGIK OMILLAR TA'SIRI	173
3-SHO'BA: ROBOTOTEXNIKA VA AVTOMATLASHTIRILGAN BOSHQARUV TIZIMLARI		179
<i>Asrayev M, Tursunaliyeva O</i>	HTTP GET ORQALI SERVERGA ULANISH.	179
<i>M.E. Tursunov, Sh.M. Norbekov</i>	AVTOMOBILLAR UCHUN PELTIER EFFEKTI ASOSIDAGI MINI AQLLI SUV SOVITISH TIZIMINI ISHLAB CHIQISH VA TADQIQ ETISH	188
<i>Yakubov S, Xasanova Sh.</i>	ROBOTOTEXNIKA VA AVTOMATLASHTIRILGAN BOSHQARUV TIZIMLARINING O'ZBEKISTONDA RIVOJLANISH TENDENSIYALARI INTELLEKT	194
4-SHO'BA: KIBERXAVFSIZLIK VA MA'LUMOTLARNI HIMOYA QILISH		201
<i>Sh.A.Toirov, A.A.Seytnazarova, T.E.Xudoyqulov</i>	OPTIMIZING GLOBAL SEARCH PROBLEMS USING GROVER'S QUANTUM ALGORITHM	201
<i>Toshpo'latov Sh</i>	VEB-ILOVALARDA HTTP XAVFSIZLIK SARLAVHALARINI JORIY ETISHNING DOLZARB MUAMMOLARI	209
<i>Очилов Н, Набиев С</i>	АНАЛИЗ АРХИТЕКТУРНОГО СЛОЯ ИСТОЧНИКОВ ДАННЫХ DLP-СИСТЕМ ДЛЯ ГИБРИДНЫХ КОРПОРАТИВНЫХ СРЕД	215
<i>Toirov Sh, Asrayev M, Yo'ldoshaliyeva G</i>	KIBERHUJUM VA UNGA QARSHI KURASH	225
<i>Karabayev R.</i>	O'ZBEKISTONDA KIBERXAVFSIZLIK HOLATINI BAHOLASH VA KIBERXAVFLARNING STATISTIK TAHLILI	229

5-SHO'BA: TA'LIMDA AXBOROT VA INNOVATSION TEKNOLOGIYALARNING QO'LLANILISHI		237
<i>Suyunov Y, Nazarov U</i>	RAQAMLI TA'LIM TEKNOLOGIYALARINI RIVOJLANTIRISH MARKAZIDA MOLIVAVIY NAZORATINI TASHKIL ETISHNING AMALDAGI HOLATI	237
<i>Gulyamova Sh</i>	THE NEW SETUP IN ENGLISH LANGUAGE TEACHING (ELT): THE INTEGRATION OF INNOVATIVE TECHNOLOGIES AND STANDARD CLASSES	247
<i>Xashimov A, Mamatov A</i>	KADRLARNI BAHOLASH VA RIVOJLANTIRISH UCHUN ELEKTRON BAHOLASH TIZIMLARI TAHLILI	252
<i>Mirzaev R.</i>	MATERIALLARNI ME'YORLASHTIRISH JARAYONIDA DATA ANALITIKA VA SUN'IY INTELLEKT TEKNOLOGIYALARIDAN FOYDALANISH MUAMMOLARI VA YECHIMLARI	264
<i>Xaydarov S</i>	TALABALARNI TARBIYALASHDA JISMONIY VA MA'NAVIY BARKAMOLLIKNI SHAKLLANTIRISHNING PEDAGOGIK MEXANIZMLARIDA AXBOROT VA INNOVATSION TEKNOLOGIYALARNING QO'LLANILISHI	269
<i>Anarkulova G, Mamajonova R.</i>	OLIV TA'LIMDA MAXSUS FANLARNI O'QITISHDA INNOVATSION TA'LIM TEKNOLOGIYALARIDAN FOYDALANISH: MUAMMOLAR VA YECHIMLAR	278
<i>Sherova D.</i>	OLIV TA'LIMDA INNOVATSION TEKNOLOGIYALAR VA SUN'IY INTELLEKT ASOSIDA MUSTAQIL TA'LIMNI TASHKIL ETISH IMKONIYATLARI	284
<i>Mukhamadiyev A, Sh.A.Toirov</i>	OPTIMIZING EDUCATIONAL PROCESSES WITH GENERATIVE AI: INNOVATIVE INSTRUCTIONAL DESIGN AND AUTOMATED ASSESSMENT TOOLS	290
<i>Xoshimova M.</i>	AKMEOLOGIK YONDASHUV ASOSIDA TALABALARDA KONFLIKTOLOGIK	301

	KOMPETENTLIKNI RIVOJLANTIRISH	
<i>Olamova M.</i>	PEDAGOGIK LOYIHALASHDA TALABALARDA AXBOROT-KONSTRUKTIV KOMPETENSIYANI SHAKLLANTIRISHNING PEDAGOGIK ASPEKTLARI	306
<i>Mamadaliyev N.</i>	RAQAMLI TEXNOLOGIYALAR YORDAMIDA “MA’LUMOTLAR TUZILMASI VA ALGORITMLAR” FANINING DASTURIY TA’MINOTINI PEDAGOGIK QO’LLASH METODIKASI	311
<i>G’aniyeva M. Yunusova I</i>	BARQAROR RIVOJLANISH HISOBOTI (ESG) – KORXONALARNING INVESTITSION JOZIBADORLIGINI OSHIRISHNING ZAMONAVIY AUDITI SIFATIDA	315
<i>Juraboyeva Sh.</i>	TA’LIM VA BIZNES INTEGRATSIYASIDA RAQAMLI PLATFORMALARNING AHAMIYATI.	320
<i>Anvarov D.</i>	O’ZBEKISTONNING ENG YANGI TARIXI FANINI O’QITISHDA AXBOROT VA INNOVATSION TEXNOLOGIYALARNING QO’LLANILISHI: METODOLOGIK TAHLIL VA SAMARADORLIK	326
<i>Usmonova M.</i>	TELEFONGA TOBELIK – NOMOFOBIYA: ZAMONAVIY DAVRNING PSIXOLOGIK ILLATLARI.	331
<i>Jo’rayeva N</i>	KORXONALARDA BOSHQARUV JARAYONLARINI TAKOMILLASHTIRISH: CRAFERS SHIRINLIKLAR KORXONASI MISOLIDA EMPIRIK TADQIQOT	340
<i>A. M. Романова, С.А. Олимов</i>	ЗНАЧЕНИЕ СЕТЕВОЙ ФОРМЫ ВЗАИМОДЕЙСТВИЯ ПРИ РЕАЛИЗАЦИИ ОБРАЗОВАТЕЛЬНЫХ ПРОГРАММ УВО ДЛЯ ИНЖЕНЕРНО-ПЕДАГОГИЧЕСКОГО ОБРАЗОВАНИЯ	349
<i>Suyunova N</i>	RAQAMLI TEXNOLOGIYALARDAN FOYDALANGAN HOLDA MATEMATIKA DARSLARIDA MANTIQIY VA TANQIDIY FIKRLASHNI RIVOJLANTIRISH	354
<i>Уснитдинов М</i>	РОЛЬ РУССКОГО ЯЗЫКА В ФОРМИРОВАНИИ НАЦИОНАЛЬНОЙ ИДЕНТИЧНОСТИ (НА ПРИМЕРЕ УЗБЕКИСТАНА).	361

6-SHO'BA: BIZNES JARAYONLAR VA RAQAMLI IQTISODIYOTGA AXBOROT TEXNOLOGIYALARINING O'RNI.		368
<i>Axmedov X.D, Kamalov Sh.F</i>	SANOAT KORXONALARIDA OPTIMAL XARAJATLAR STRATEGIYASINI AMALGA OSHIRISH YO'LLARI	368
<i>Sodiqov M</i>	TOVARLAR VA XIZMATLARNI KENG TABAQALASHTIRISH YO'NALISHLARI	381
<i>R.B.Mirzayev</i>	REKLAMA TIZIMI VA SOTUV JARAYONINI MUVOFIQLASHTIRISH MASALALARI.	388
<i>Primov S, Akramov J</i>	RAQAMLI IQTISODIYOT SHAROITIDA DAVLAT MOLIYASINI BOSHQARISHNING ZAMONAVIY MEKANIZMLARI	392
<i>Karabayev R.</i>	ИСККУССТВЕННЫЙ ИНТЕЛЛЕКТ В ЦИФРОВОЙ ЭКОНОМИКЕ УЗБЕКИСТАНА	401
<i>Абдураимова Н, Зоҳидов А</i>	ПУТИ ДОСТИЖЕНИЯ ЭКОНОМИЧЕСКОГО РОСТА ЗА СЧЁТ УСТОЙЧИВОГО РАЗВИТИЯ СЕТЕЙ В УЗБЕКИСТАНА	407
<i>М.Асраев, Ш.Акбаров</i>	ТЕХНОЛОГИЧЕСКИЙ ФУНДАМЕНТ КОМПОЗИТНОГО БИЗНЕСА	417
<i>Abduraimova N, Zohidov A</i>	BARQAROR TARMOQLARNING IQTISODIY O'SISHGA TA'SIRINI BAHOLASHNING DOLZARB MODELLARI: O'ZBEKISTON TAJRIBASI	422
<i>Samatov A, Turdibekova S.</i>	RAQAMLI IQTISODIYOT SHAROITIDA KORPORATIV BOSHQARUV JARAYONIGA RAQAMLI TEXNOLIGYALARNI JORIY QILISHNING SAMARADORLIGI.	430
<i>Samatov A, Turdibekova S.</i>	RAQAMLI IQTISODIYOT SHAROITIDA KORPORATIV BOSHQARUV ASOSLARI VA UNING ZAMONAVIY MODELLARI TAHLIL QILISH	435
<i>Toxirov J.</i>	EKOLOGIK STANDARTLAR JORIY ETILISHIDA BUYRUQBOZLIK VA BOZOR MEKANIZMLARINING TA'SIRI	440

<i>Maxmudov J.</i>	O'ZBEKISTONNING "TASHQI QARZ ORQALI RIVOJLANISH STRATEGIYASI"	450
<i>Shoyev D, Abdullayeva G.</i>	BOSHQARUV SIFATIGA TA'SIR QILUVCHI OMILLAR TAHLILI	459
<i>Daminova O', Pulatov Sh.</i>	QISHLOQ XO'JALIK KORXONALARINING IQTISODIY MOHIYATI, TASNIFI VA FAOLIYAT XUSUSIYATLARI	467
<i>Daminova O', Pulatov Sh.</i>	QISHLOQ XO'JALIK MAHSULOTLARINI XALQARO BOZORLARGA OLIB CHIQISH STRATEGIYALARINI ISHLAB CHIQISH	471
<i>Narbayev Sh.K. Nabixonov S.</i>	BIZNES ETIKASIDAN KORPORATIV MADANIYATNI SHAKLLANTIRISH VOSITASI SIFATIDA FOYDALANISH	480
<i>Muydinov N</i>	RAQAMLI IQTISODIYOT RIVOJLANISHI VA IT TEXNOLOGIYALARINING IQTISODIY SAMARADORLIGI	487
<i>Primov S, Shakirov X.</i>	DAVLAT TASHQI QARZI VA MOLIYAVIY BARQARORLIKNI TA'MINLASH YO'LLARI	491
<i>Primov S, Shakirov X</i>	RAQAMLI TRANSFORMATSIYA SHAROITIDA "YASHIL" IQTISODIYOTNING STRATEGIK YO'NALISHLARI VA ISTIQBOLLARI.	498
<i>Bozorov J</i>	MEHNAT MIGRATSIYASINI KAMAYTIRISHDA KICHIK BIZNESNING IQTISODIY AHAMIYATI	505
<i>Mamajonov A</i>	STARTAPLARNI QO'LLAB-QUVVATLASH MARKAZLARI FAOLIYATI: JAHON TAJRIBASI VA O'ZBEKISTON AMALIYOTI	511
<i>Samatov A, Kushbakov B</i>	KORXONANING IQTISODIY SALOHİYATIDAN SAMARALI FOYDALANISH JARAYONLARI	516
<i>X.D.Axmedov, Kamalov.Sh</i>	KORXONADA TEXNIKAVIY VA MEHNAT RESURLARINI BOSHQARISH TAHLILI	521
<i>Karabayev R</i>	RAQAMLI IQTISODIYOT: NAZARIY ASOSLARI VA O'ZBEKISTONDA RIVOJLANISH YO'NALISHLARI	527
<i>Туракулов О, Асраев М,</i>	ЛУЧШИЕ РЕШЕНИЯ ДЛЯ ОПТИМИЗАЦИИ ЛОГИСТИКИ	532

<i>Мирзаева О.</i>		
<i>Алимов О</i>	ФОРСИРОВАННАЯ ИНТЕРНАЦИОНАЛИЗАЦИЯ БИЗНЕСА В УСЛОВИЯХ ЦИФРОВОЙ ЭКОНОМИКИ: ИИ-ПОДХОД ДЛЯ ЭКСПАНСИИ НА ВНЕШНИЕ РЫНКИ	543
<i>Nazarov X</i>	OCHIQ BANK (OPEN BANKING) FAOLIYATINING XALQARO TAJRIBASI VA O'ZBEKISTONDA QO'LLANILISHI	551
<i>Narbayev Sh.K, Nabixonov S</i>	ISHBILARMONLIK ETIKASINI RIVOJLANTIRISHNI KORPORATIV MADANIYATGA TA'SIRI	560
<i>R.B.Mirzayev</i>	TADBIRKORLIK FAOLIYATIDA SOLIQ HUQUQI MADANIYATINING AHAMIYATI	572
<i>Narbayev Sh.K, Axmadaliyev V.A.</i>	QISHLOQ XO'JALIGI YERLARI MONITORINGINI YURITISHDA MASOFADAN ZONDLASH VA RAQAMLI TEXNOLOGIYALARDAN FOYDALANISH	580
<i>Soliyev D</i>	SOLIQ MA'MURCHILIGINI RAQAMLASHTIRISH: AFZALLIKLARI VA IMKONIYATLARI	590
<i>Samatov A, Allanov U</i>	SIFAT MENEJMENT TIZIMIDA NOMUVOFIQLIKLARNI ANIQLASH USULLARI	597
<i>Narbayev Sh, Abdufattoxova H</i>	MENEJMENT FAOLIYATIDA SUN'IY INTELLEKTNING INNOVATSION YECHIMLARI	600
<i>Narbayev Sh.K, Abduqayumov A</i>	KORXONALARDA ESG (Environmental, Social, Governance) KO'RSATKICHLARINI JORIY ETISHDA MENEJMENTNING ROLI	605
<i>Primov S, Akramov J</i>	DAVLAT MOLIVASINING BARQARORLIGINI TA'MINLASHNING ASOSIY MUAMMOLARI VA BARTARAF ETISH YO'LLARI	611

Ingliz tili muharriri: Norbekov Shohzod Mamarasul o'g'li
Sahifalovchi va dizayner: Zoirov Sardor Ziyodin o'g'li

2026. № 2

© Materiallar ko'chirib bosilganda, **"Management and Economics Scientific Research Journal"** jurnali manba sifatida ko'rsatilishi shart. Jurnalda bosilgan material va reklamalardagi dalillarning aniqligiga mualliflar mas'ul. Tahririyat fikri har vaqt ham mualliflar fikriga mos kelmasligi mumkin. Tahririyatga yuborilgan materiallar qaytarilmaydi.

Mazkur jurnalda maqolalar chop etish uchun quyidagi havolalarga maqola, reklama, hikoya va boshqa ijodiy materiallar yuborishingiz mumkin.
Materiallar va reklamalar pulli asosda chop etiladi.

El. pochta: journals@timeedu.uz

Tel.: +998 95 651 90 00

"Management and Economics Scientific Research Journal" jurnali 19.09.2024-yildan O'zbekiston Respublikasi Prezidenti Administratsiyasi huzuridagi Axborot va ommaviy kommunikatsiyalar agentligi tomonidan 404368-son reyestr raqami tartibi bo'yicha ro'yxatdan o'tkazilgan. Litsenziya raqami:

C-5669639

PNFL: 308906510

Manzilimiz: Toshkent shahar Yakkasaroy tumani
Shota Rustaveli ko'chasi, 114