Abstract

Abstract English

Artificial Intelligence (AI) and Machine Learning (ML) have become transformative innovation areas within Information Technology, driving advancements across multiple domains including cybersecurity, healthcare, finance, and more. This paper explores key innovations and trends in AI and ML, highlighting their applications and impact. Significant progress in Natural Language Processing (NLP) has led to enhanced language models, while computer vision advancements enable real-time image and video recognition. Reinforcement learning algorithms are revolutionizing robotics and autonomous systems, and generative models such as GANs and VAEs are transforming content creation. Additionally, explainable AI (XAI) techniques are increasing transparency and accountability in AI decisions. Federated learning enhances data privacy by allowing decentralized model training, and automated machine learning (AutoML) tools simplify the development of ML models for non-experts. AI and ML innovations are particularly impactful in healthcare, enabling predictive analytics, personalized treatment, and advanced medical imaging. In finance, they enhance fraud detection, algorithmic trading, and personalized financial advice. Smart cities and IoT benefit from intelligent traffic management and energy optimization, while retail and e-commerce leverage AI for personalized shopping experiences and efficient inventory management. Despite these advancements, challenges such as ethical AI, scalability, and human-AI collaboration remain critical. This paper emphasizes the need for continued innovation and responsible deployment to maximize the benefits of AI and ML while mitigating associated risks.

Abstract swahili

Muhtasari

Akili Bandia (AI) na Ujifunzaji wa Mashine (ML) zimekuwa maeneo ya uvumbuzi yanayobadilisha ndani ya Teknolojia ya Habari, zikisukuma maendeleo katika nyanja mbalimbali ikiwa ni pamoja na usalama wa mtandao, afya, fedha, na zaidi. Karatasi hii inachunguza uvumbuzi muhimu na mitindo katika AI na ML, ikionyesha matumizi yao na athari zake. Maendeleo makubwa katika Usindikaji wa Lugha Asilia (NLP) yamesababisha mifano iliyoboreshwa ya lugha, wakati maendeleo ya maono ya kompyuta yanamwezesha utambuzi wa picha na video kwa wakati halisi. Taratibu za kujifunza kwa kuimarisha zinabadilisha roboti na mifumo ya uhuru, na mifano ya kizazi kama GANs na VAEs inabadilisha uundaji wa maudhui. Aidha, mbinu za AI inayoelezeka (XAI) zinaongeza uwazi na uwajibikaji katika maamuzi ya AI. Kujifunza shirikishi kunaboresha faragha ya data kwa kuruhusu mafunzo ya modeli iliyogatuliwa, na zana za ujifunzaji wa mashine otomatiki (AutoML) rahisisha maendeleo ya modeli za ML kwa wasio wataalamu. Uvumbuzi wa AI na ML una athari kubwa hasa katika afya, kuwezesha uchambuzi wa kutabiri, matibabu ya kibinafsi, na picha za matibabu za hali ya juu. Katika fedha, zinaboresha utambuzi wa udanganyifu, biashara ya kimitambo, na ushauri wa kifedha wa kibinafsi. Miji mizuri na IoT

hunufaika na usimamizi wa trafiki wa akili na uboreshaji wa nishati, wakati rejareja na e-commerce zinatumia AI kwa uzoefu wa ununuzi wa kibinafsi na usimamizi wa hesabu bora. Licha ya maendeleo haya, changamoto kama AI ya kimaadili, uwezo wa kupanuka, na ushirikiano wa binadamu na AI zinabaki kuwa muhimu. Karatasi hii inasisitiza hitaji la uvumbuzi unaoendelea na utekelezaji unaowajibika ili kuongeza manufaa ya AI na ML huku ikipunguza hatari zinazohusiana.

Abstarct Luo

Abstract

Muhtasari

Artificial Intelligence (AI) kod gi Machine Learning (ML) osebedo thurgi ma adiera eyo e piny Information Technology, motelo nyiseche mochwer e dieruok mopogore kaka cybersecurity, kendo kar tedo, pesa, kod mang'eny. Barapeni oneno thurgi maduong' kod mitimo AI kod ML, ka okwong'o kaka ilosoga kod gimoro ma opogore ahinya. Chuno moloyo eyo e Usenikgi Natural Language Processing (NLP) ema omiyo loso goyo dhoot, kane losogo komputa miyo ii mar itim pich kod video e kinde ma kamano. Algorithmi mag reinforcement learning omiyo loso roboti kod migepe mokalo gi luoro, kendo generative models chalo gi GANs kod VAEs omiyo loso gik manitiere. Kamano bende, kit ma en explainable AI (XAI) omiyo loso mar ng'eyo kendo ratiro e yore mag AI. Federated learning omiyo loso yot e kawo chandruok mayom to loso modeli mag decentralized, kendo agal mag machine learning mag automated (AutoML) omiyo loso seche mag loso modeli mag ML kuom jomoko ma ok ong'eyo. Thurgi mag AI kod ML machalre mogik gi chik eyo e kar tedo, kamiyo loso mayot kod chakruok mochwe, kod loso picha mag tedo manyiso pile. E kar pesa, gi loso ng'eyo udong' e tije ma opogore, goyo algorithmic, kod loso miyo ratiro kuom pesa. Piny manyalo timore kod IoT mondo kony kode ma en ng'eyo e tije magoth kendo loso manyalo ngima, kane losogo agal eyo e loso mar miyo joma neno gach. Kata kamano gi thurgi, chando chalre kaka ethical AI, scalability, kod human-AI collaboration tinde thurgi ma muofni. Barapeni omiyo loso thurgi maduong' kod ratiro kuom tiyo eyo e AI kod ML kendo ng'eyo gik mayombo gi luoro magthurgi kod risks.