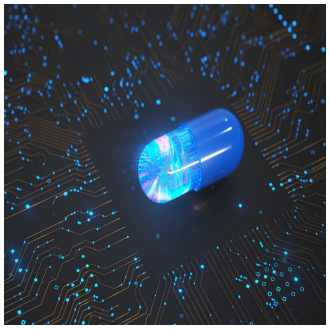
HealthManagement
Promoting Management and Leadership

Advancing Equitable AI in Healthcare with MLOps



Artificial intelligence (AI) and machine learning (ML) offer transformative possibilities for healthcare, enhancing diagnostics, treatment planning and patient outcomes. However, scaling these technologies requires frameworks that ensure equitable access and effectiveness for diverse patient populations. Machine Learning Operations (MLOps) provide the tools and methodologies needed to scale AI responsibly within healthcare settings, focusing on accountability, fairness and efficiency. MLOps principles can support the development of equitable AI solutions, aiding the healthcare sector in deploying AI tools that are both impactful and inclusive.

Integrating AI for Inclusive Care

The first essential step in equitable AI deployment is the integration of AI/ML tools into clinical workflows to make them accessible to a broad spectrum of patients. MLOps frameworks support this by assessing workflows, identifying critical stages for AI integration and establishing models that adapt to diverse clinical environments. This systematic integration allows AI tools to function effectively across different settings, including under-resourced areas, minimising bias and enhancing inclusivity. By customising AI models to suit various clinical contexts, healthcare providers can ensure that all patient populations benefit from these technologies, irrespective of their background or location.

One essential aspect of this integration involves ensuring that AI models are adapted to the unique requirements of different patient groups. For instance, MLOps principles guide the incorporation of social determinants of health, which can impact patient outcomes, into AI models. By accounting for these factors, healthcare providers can develop AI solutions that are better aligned with the needs of various populations, promoting fair treatment across clinical environments.

Collaborative and Transparent AI Development

Equitable AI deployment requires collaboration among diverse stakeholders, including healthcare providers, ethics and compliance officers, researchers and patient advocates. MLOps promotes this collaborative approach by incorporating health equity assessments and creating multidisciplinary panels to guide AI implementation. These panels contribute to transparency in AI operations, ensuring that all model decisions align with ethical and safety standards. Through shared insights and accountability, MLOps supports decision-making processes that prioritise the welfare of patients, encouraging transparent and ethically sound AI practices. This collaborative structure is critical in maintaining patient trust and building confidence in AI applications within healthcare.

The role of MLOps extends to establishing a culture of accountability, where all team members contribute to assessing and maintaining equity in AI implementations. With consistent documentation and transparency about AI models, healthcare organisations can communicate how equity, safety and performance standards are upheld. This builds a framework of trust not only internally within the organisation but also with external stakeholders, including patients, regulators and the public. Through proactive involvement of diverse voices, healthcare systems can better ensure AI solutions align with the expectations and rights of the populations they serve.

Ongoing Monitoring and Compliance

AI models must maintain accuracy and fairness over time to continue delivering effective patient care. MLOps frameworks facilitate continuous monitoring, tracking fairness metrics and recalibrating models to address any drift in performance or equity. With evolving regulatory standards in healthcare AI, MLOps also ensures that organisations stay compliant, implanting quality and fairness checks throughout the deployment lifecycle. Automated monitoring systems in MLOps uphold regulatory standards and pre-emptively address potential issues before they impact patient care. These measures safeguard against inequitable practices and enforce a consistent standard of care, reinforcing the credibility and reliability of AI in healthcare.

For example, MLOps enables the detection of fairness drift, where changes in the model's performance might result in unintended biases against specific groups. By setting trigger points for recalibration, healthcare organisations can ensure that any changes in patient demographics, treatment methods or clinical conditions are reflected in model adjustments. This ability to continuously adapt to regulatory shifts and evolving medical knowledge helps healthcare providers meet strict compliance requirements while preserving the trust of patients and regulators.

As AI becomes increasingly integral to healthcare, MLOps offers a critical foundation for equitably deploying and scaling these technologies. By focusing on integration, collaboration and continuous monitoring, MLOps frameworks help ensure that AI models contribute to fair, accessible and transparent healthcare solutions. With MLOps, healthcare providers can leverage AI's benefits responsibly, prioritising patient safety and equity while cultivating trust in these transformative technologies.

Source: **BMJ Health & Care Informatics**

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