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MoPT—AI-Enhanced Skills Training through Scalable VR Simulation

Olayinka Kowobari

Founder & CEO, Mo Personal Trainer, Consultant Neonatologist & Healthcare Leader, UK

Abstract

Medical competency and patient safety are challenged by persistent training shortfalls, declining procedural skills, and limited access to quality hands-on education. MoPT's proprietary VR simulation system addresses these issues with an interoperable, AI-driven platform offering high fidelity 3D scenarios accessible to learners worldwide. The platform leverages high-fidelity models developed in-house and mapped with patent-pending adaptive feedback engines to deliver individualized clinical skills training across core specialties, including vascular access, endoscopic techniques, point of care ultrasound and surgical interventions. Building with Unity and Unreal engines, MoPT's simulation modules combine visual, auditory, and haptic elements with physics-based interactions (e.g., tissue deformation, fluid simulation), enhancing procedural realism and knowledge retention.

The core value proposition centres around scalable access: MoPT modules run on affordable VR hardware, democratizing medical upskilling for both urban and remote clinical environments. A comprehensive analytics pipeline provides real-time error detection, proficiency scoring, adaptive scenario progression, and detailed report summaries, accessible through a secure learning management interface. Performance data—included with user consent enables iterative AI model refinement, robust benchmarking, and the development of personalized learning trajectories. MoPT integrates qualitative and quantitative evaluation, utilizing structured clinical assessment tools, pre/post knowledge testing, and cognitive load metrics to validate educational efficacy.

Technically, MoPT offers

- Advanced AI modules for gesture recognition, force monitoring, sequence tracking, and real-time instructional feedback.
- Modular expansion to accommodate clinical domains, complications, and specialty scenarios.
- Native support for performance analytics dashboards, error heatmaps, and institutional reporting for accreditation and continuous improvement.

Conclusion

MoPT's AI-enhanced VR platform exemplifies the future of digital simulation-based medical education, blending advanced technical innovation with broad accessibility and outcome-focused rigour. Ongoing clinical validation, adaptive expansion, and rigorous data-driven research underpin our aspiration to redefine global standards in medical training.