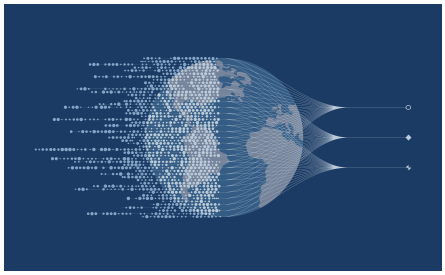

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Artificial Intelligence for confidence building and treaty verification in the CTBT framework: bridging technical innovation and science diplomacy

How can Artificial Intelligence (AI) enhance the CTBT's verification regime and contribute to confidence-building among States Parties, while promoting science diplomacy to achieve universalization and entry into force? This paper explores the potential of Artificial Intelligence to revolutionize the Comprehensive Nuclear-Test-Ban Treaty (CTBT) verification regime and foster international confidence-building. By enhancing detection capabilities, reducing false positives and streamlining data analysis, AI can address longstanding technical and political challenges that impede the Treaty's universalization and entry into force. Through the lens of science diplomacy, this study examines how AI-driven tools can reinforce the credibility of the International Monitoring System (IMS), strengthen the operational efficacy of On-Site Inspections (OSIs) and provide transparent data-sharing mechanisms to promote trust among States Parties. The integration of AI with the CTBT's verification framework not only exemplifies cutting-edge scientific collaboration but also highlights the interplay between technological innovation and the political will necessary for advancing global nuclear governance.

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