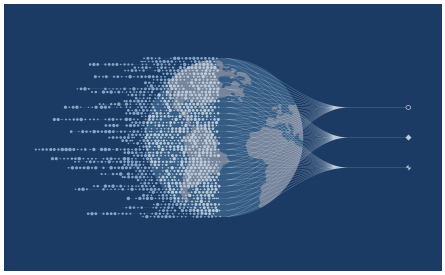

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for Tolerance: Using Gamification to Drive Youth Engagement in the Nuclear-Test-Ban Treaty

This paper explores how gamification can enhance youth engagement in CTBT advocacy and verification. By bridging barriers, gamification fosters participation in test ban monitoring at the intersection of technology, policy, and advocacy. CTBTO's mission depends on global awareness, technical expertise, and diplomatic engagement—yet youth involvement remains limited due to technical complexity and access challenges. This research examines how serious games, AI-driven simulations, and blockchain-based verification can address these gaps, equipping youth with tools to monitor and advocate for nonproliferation. Key focus would be integrating gamification into IMS applications. AI-driven anomaly detection challenges could train youth to interpret datasets, distinguish nuclear tests from seismic events, and apply ATM to track radionuclide dispersion. Gamified exercises could simulate verification tasks, enabling users to identify clandestine tests. AR-based OSI scenarios would allow players to deploy sensors, analyze isotopes, and conduct forensic radiochemistry, mirroring CTBTO methodologies.
This paper analyzes the potential of gamification techniques like Global Nuclear Test-Risk Map, AI-powered Crisis Simulation, and Radiation Propagation Simulator. Inspired by NUKEMAP and NATO's Locked Shields, it envisions a gamified CTBT platform integrating historical test data into scenario-based missions. AI-driven learning ensures scalable participation, fostering a technically-proficient generation committed to nuclear verification and policy advocacy.

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