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Imaginarium :Interactive Learning Platform for Concept visualization

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Abstract: *The integration of Augmented Reality (AR) and 3D visualization in education has revolutionized the way students engage with complex STEM concepts. Traditional methods often rely on static textbooks, which fail to convey abstract ideas effectively. To address this gap, we present Imaginarium, a mobile application that dynamically generates interactive 3D models of chemical molecules and mathematical equations, enabling immersive exploration through AR. Built using React Native, Three.js, and Viro React, the app leverages PubChem APIs for molecular data and equation parsing for mathematical graphs. Key contributions include real-time model generation, secure user authentication, and seamless AR placement. Tested on molecules like H_2O and equations like $a^2 + b^2$, the app demonstrates high accuracy, responsiveness, and user engagement. Future enhancements aim to expand into Biology and Physics, offering a scalable solution for modern education.*

Keywords: Augmented Reality (AR), 3D Model Generation, Education Technology (EdTech), STEM Learning, Interactive Visualization

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