Neuroadaptive EdTech Challenge

Overview:

The global EdTech industry has matured into a USD 20 billion juggernaut—yet most platforms still deliver content in static formats. A true paradigm shift awaits at the intersection of neuroscience and learning technology: consumer-grade brain–computer interfaces (BCIs), real-time affective sensing, and generative AR overlays open the door to “subconscious coaching” and micro-dream reinforcement. This hackathon challenges teams to imagine what no one else has built: neuroadaptive learning experiences that blur the line between waking instruction and REM-adjacent memory consolidation.

Problem:

Create an open-source neuroadaptive learning prototype that harnesses real-time brainwave data from consumer BCI devices to trigger creative, context-aware micro-interventions and dynamically generate personalized learning artifacts—such as bespoke analogies, AR experiences, or adaptive quizzes—based on each learner’s cognitive and emotional state. Your solution should break new ground in EdTech by exploring novel sensing modalities, inventive feedback loops, and unexpected engagement strategies, inviting you to push the limits of what a truly brain-aware educational platform can be.

Suggested Focus Areas:

- Neuro-Sensing & State Detection: Integrate consumer BCI SDKs to stream and preprocess EEG signals, then classify attention, relaxation, or drowsiness in real time with lightweight AI models.
- Adaptive Intervention & Content Generation: Prototype AR/VR micro-interventions (e.g., floating visuals, audio cues) and AI-driven pipelines that generate custom analogies, mnemonics, or quizzes based on neural markers.
- Ethical, Comfortable UX & Dev Pipeline: Ensure privacy with local-only data handling and explicit consent flows, design minimal-intrusion wearable UIs, and provide scripts or GitHub Actions for EEG simulation, AR demo builds, and PWA deployment.

What to Submit:

- Code Repository: Public GitHub link with clear README, one-click simulation of EEG streams, and build/deploy instructions.
- Interactive Prototype: A live demo or recorded walkthrough showing EEG-driven intervention in action.
- Flow Diagram: Visual schematic mapping data flow from BCI → signal classification → intervention generation → deliverable UI.
- Ethics & Safety Brief: 1-page overview of privacy measures, comfort testing, and user consent design.

Starter Repos & Tools:

- **OpenBCI JavaScript SDK:** https://github.com/OpenBCI/OpenBCI_NodeJS
- **Brain.js Neural Networks:** https://github.com/BrainJS/brain.js
- **WebXR Device API Samples:** https://github.com/immersive-web/webxr-samples
- **Three.js for AR/3D:** https://github.com/mrdoob/three.js
- **GPT-Neo Fine-Tuning:** https://github.com/EleutherAI/gpt-neo
- **PWA Starter:** https://github.com/pwa-builder/pwa-starter

Tip:

Push beyond conventional UX—blend waking and dreaming states, prioritize user comfort, and build with full transparency around consent and data privacy.