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import streamlit as st
import matplotlib.pyplot as plt
import numpy as np

def plot_waveform(harmonics):
    # Create simulated waveform from harmonics name (alpha, beta, gamma)
    x = np.linspace(0, 4 * np.pi, 500)
    freq_map = {'alpha': 5, 'beta': 15, 'gamma': 30}
    freq = freq_map.get(harmonics, 10)
    y = np.sin(freq * x) * np.exp(-x/10)

    fig, ax = plt.subplots(figsize=(8, 2))
    ax.plot(x, y, color='purple')
    ax.set_title(f"Simulated Waveform ({harmonics})")
    ax.set_ylim(-1.1, 1.1)
    ax.axis('off')
    st.pyplot(fig)

def plot_scores(intent_score, discordance):
    categories = ['Intent Score', 'Discordance']
    values = [intent_score, discordance]
    colors = ['green', 'red']

    fig, ax = plt.subplots(figsize=(6, 4))
    bars = ax.bar(categories, values, color=colors)
    ax.set_ylim(0,1)
    ax.set_title("Scores")
    for bar in bars:
        yval = bar.get_height()
        ax.text(bar.get_x() + bar.get_width()/2, yval + 0.03, f"{yval:.2f}", ha='center')
    st.pyplot(fig)

def plot_emotional_map(intent_score, discordance):
    # Create heatmap from intent & discordance values
    fig, ax = plt.subplots(figsize=(4, 4))
    data = np.array([[intent_score, discordance],
                     [discordance, intent_score]])
    cax = ax.matshow(data, cmap='RdYlGn_r')
    for (i, j), val in np.ndenumerate(data):
        ax.text(j, i, f"{val:.2f}", ha='center', va='center', color='black')
    ax.set_xticklabels(['', 'Intent', 'Discordance'])
    ax.set_yticklabels(['', 'Row1', 'Row2'])
    ax.set_title("Emotional Map")
    fig.colorbar(cax)
    st.pyplot(fig)

def main():
    st.title("Quantum Consent Engine Visualization Demo")

    intent_score = st.slider("Intent Score", 0.0, 1.0, 0.75)
    discordance = st.slider("Discordance", 0.0, 1.0, 0.25)
    harmonics = st.selectbox("Harmonics (Simulated Waveform)", ["alpha", "beta", "gamma"])

    st.write("### Waveform Simulation")
    plot_waveform(harmonics)

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```
st.write("### Intent and Discordance Scores")
plot_scores(intent_score, discordance)

st.write("### Emotional Map")
plot_emotional_map(intent_score, discordance)

if __name__ == "__main__":
    main()
```