ChatGPT

# 📊 Biofeedback Tracker

A real-time **biofeedback application** that monitors physiological signals (e.g., heart rate, HRV, stress) from a mobile device or simulated input. It integrates with **5G Network APIs (NEF/PCF)** to dynamically adjust QoS policies and trigger emergency alerts in case of critical stress.

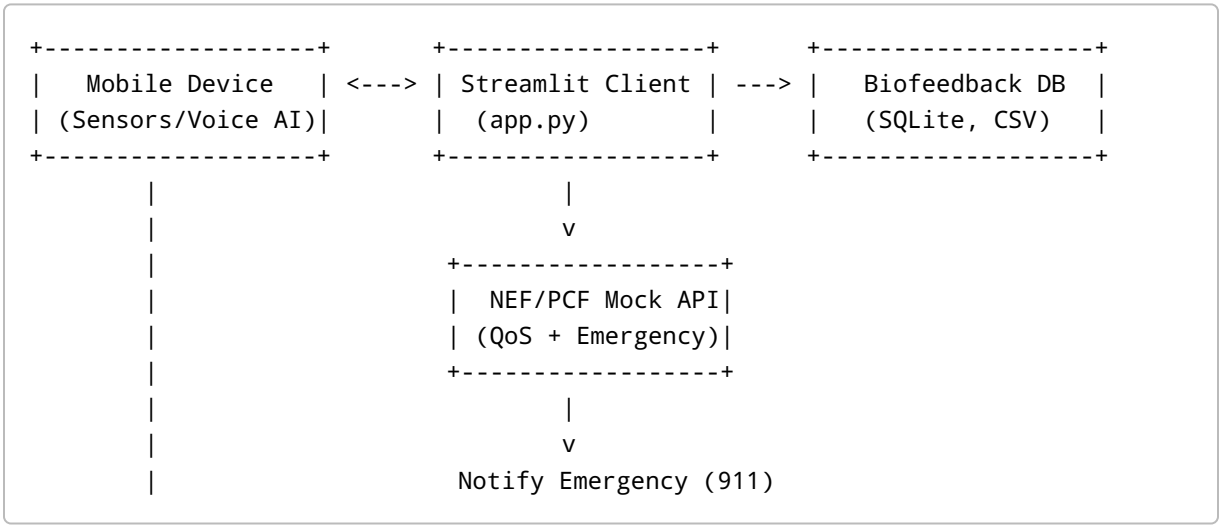
---

## Features

- **Real-Time Data Monitoring** (heart rate, HRV, stress)
- **Mood Classification**: Focused, Distracted, Stressed, Critical
- **Stress Peak Detection** with timeline
- **QoS Policy Integration** via NEF/PCF mock APIs
- **911 Emergency Trigger** when stress exceeds critical threshold
- **Session Logging** into SQLite and CSV export
- **Voice Summary**: Spoken feedback using TTS (Text-to-Speech)
- **Optional voice input** with Whisper (coming soon)
- **User Notes** for emotional context

---

## Architecture Overview




---

## How to Run

1. **Clone the Repo**

```
git clone https://github.com/jmiguelg2002/biofeedback-tracker.git
cd biofeedback-tracker
```

2. **Install Requirements**

```
pip install -r requirements.txt
```

3. **Run NEF Mock API**

```
cd nef-api
uvicorn mock_api:app --reload
```

4. **Run the Biofeedback Tracker App**

```
streamlit run app.py
```

---

## Test Scenarios

- Simulate a session by selecting a user and app.
- Observe how **QoS policy** changes based on stress.
- If stress > 95, emergency alert is triggered and sent to NEF.
- Receive voice feedback at the end of session.

---

## Project Structure

```
biofeedback-tracker/
├── app.py                    # Main Streamlit app
├── db.py                     # SQLite ORM with SQLAlchemy
├── nef-api/
│   └── mock_api.py           # Mock NEF/PCF Policy and Emergency endpoint
├── requirements.txt
└── README.md
```

---

## 📦 Dependencies

- `streamlit`
- `requests`
- `sqlalchemy`
- `pyttsx3` (TTS)
- `whisper` (optional, voice input)
- `sounddevice`, `numpy` (for recording)

---

## Emergency Policy

Critical stress (stress > 95) triggers a POST to NEF API:

```
{
  "user_id": "user_001",
  "app_id": "work",
  "stress": 98,
  "emergency": true
}
```

---

## License