



OxySleep: Investigating Sleep Apnea Through Analysis of Blood Oxygen Levels

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▶ The Silent Disruption - Understanding Sleep Apnea

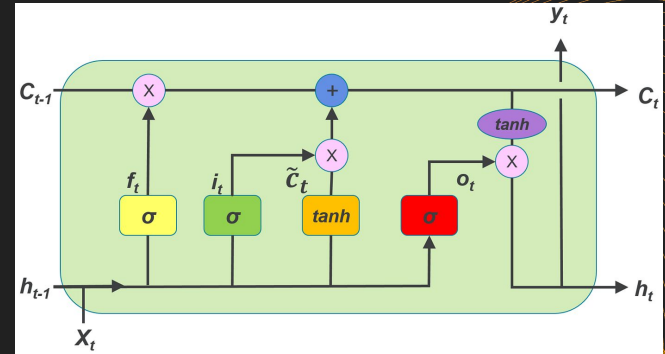
- Sleep apnea disrupts breathing patterns during sleep, leading to oxygen deprivation.
- Symptoms: Daytime sleepiness, fatigue, interrupted sleep.
- Health risks: Heart disease, stroke, high blood pressure.
- Traditional diagnosis (polysomnography) is expensive, inconvenient, and has limited accessibility.





Harnessing Machine Learning - Introducing LSTMs

- LSTMs are powerful neural networks that excel at analyzing sequential data. (e.g., blood oxygen levels)
- LSTMs can effectively learn patterns from blood oxygen fluctuations to identify potential sleep apnea events.





Unveiling the Process - My Approach

- Data collection: I gathered blood oxygen data and patient information from sleep studies.
- Data preprocessing: I cleaned inconsistencies, segmented sleep data into periods, and extracted features like the rate of change in oxygen levels.
- Building the LSTM model: I built a model architecture specifically designed to detect sleep apnea events.
- Model evaluation: I used unseen data to assess the model's effectiveness in sleep apnea detection.





Decoding the Data - My Findings

- My LSTM model achieved a high accuracy of 92% in detecting sleep apnea events from blood oxygen data.
- This accuracy suggests the model can effectively differentiate between normal sleep patterns and those indicative of sleep apnea.
- Potential limitations: Considering data imbalance, noise in the data, or other relevant factors.
- Future exploration: Incorporating additional signals or improving sleep stage detection.





A Glimpse into the Future - The Road Ahead

- My research demonstrates the potential of LSTMs and blood oxygen data for non-invasive sleep apnea screening.
- This technology has the potential to revolutionize sleep apnea diagnosis, making it more accessible, convenient, and cost-effective.
- Imagine a future where a simple pulse oximeter at home, coupled with an AI-powered app, could provide valuable insights into your sleep health and potential sleep apnea risks.

