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**An Approach to Analyze Environmental Noise Pollution Via Smartphone Mass Data Collection**

Bay area in general, and the city of Berkeley in particular, is suffering from extreme noise pollution. Nearby highways, three major airports, and, worse than all, busier-then-ever railroad with 24/7 loud whistling are exhausting the residents. Recent research shows that noise-pollution can be seriously fatal and behind a number of heart diseases.

A noise-map of the city of Berkeley is not currently in hand. It is believed that in many areas people are living in a very high level of noise-pollution well above the maximum thresholds that international standards allow. We are working with the department of environmental health - city of Berkeley to scientifically measure and map the noise level, and suggest ways to reduce the noise pollution while keeping the business going.

At the Theoretical and Applied Fluid Dynamics (TAF) Lab, I worked with Professor Reza Alam to develop, from scratch, a mobile application to detect and analyze noise pollution in City

of Berkeley. The app, commercially ready to download, records a session to accurately log surrounding frequency, amplitude, musical note, FFT, DFT, PSD, as well as user's geographical

location data. After local analysis to detect and extract environmental noise, it saves tabulated data and a copy of audio file of the session in local storage area, and provides users with an option to quickly share between two devices. Once the device is connected to the internet, it uploads the data to an online server in background (without user interruption), and downloads a processed noise pollution 3D map depicting the live and historical level of noise in different parts of city of Berkeley. I also developed a JavaScript online server to process mass live data from users and render them into a downloadable file for every app to render the map. A draft of my study on the project, as well as the actual app, is ready. It is expected to publish a paper and apply for research funding next semester. This project has potential of public and private funding by map companies, city governments, or medical research groups to study the effect of noise pollution.