**“WIFI-LANCE”**

**Problem statement:**

Measuring attendance and traffic in real time is a very useful ability for companies, universities and event organisers. It not only allows these stakeholders to improve design of events, get valuable feedback by “foot voting” or design better office spaces but also can prevent dangerous overcrowding of narrow spaces by alarming appropriate persons.

**Our solution:**

We want to present our product, “WIFI-LANCE” which is a ready to use solution for stated problem.

Nowadays everybody has mobile device with them. People usually leave Wi-Fi on especially if they travel to places with common wireless internet access such as universities, events of offices or turn it on shortly after arriving. We use this aspect of modern world to capture traffic and attendance.

We use commonly available (“to everyone”) Wi-Fi broadcasts to detect online mobile devices. We are able to distinguish between unique devices even if they broadcast the message many times over time. The data is analysed real time, and the scan can be repeated at intervals chosen by user. This allows to choose whether preferred information is attendance (long scans) or traffic (shorter scans).

No person is identified during the scan and data collected is stored only temporarily for the duration of the scan. The only purpose of the data is to distinguish between unique devices (without identification of people behind them) in order to exclude false duplicates of broadcasts.

The ideal place for our scanning devices would be at entrances of venues and inside individual rooms you want to monitor. Raspberry Pi or any computer can be used to perform scan with simple additional Wi-Fi adapter. User can access the analysed information by dedicated web interface which presents attendance/traffic data in accessible manner. The information includes how many devices from which manufacturer appeared during the single scan. Data can also be exported to JSON file.

**How it’s made:**

The system consists of 3 devices; a scanning node, server, and a client. The scanning node uses the 2.4/5GHz band to detect devices actively looking to connect to Wi-Fi. They broadcast packets when doing so, allowing us to passively scan looking for them.

The server is a middle man between the scanning nodes broadcasting data and the clients. It gathers the data collected by the nodes, stores it in the database, and gives endpoints for the client to access the anonymised data. Client fetches the data, transforms it, and displays it in the form of heatmaps, pie charts, and line charts.

**Future development:**

Possible future development would include increased accuracy of scanning and improving user interfaces. Some more features and data analysis/visualisations options could also be beneficially added.

**Team members:**

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