Topic 3: (Any/Web Dev) Using our Smartphones as Sensors – Setup and implement crowd experiment using PhyPhox in a Local Network

The best environment to observe natural behaviour is … our natural environment. However, when we take our experiments to the "real" world, we face the challenge of how to install sensors and get accurate enough measurements.
There is one device that can give us a plethora of measures more or less for free: Our smartphones. And there is a software that allows us to collect these measures from our devices in a local network (PhyPhox).

Your task is to make use of the provided infrastructure and design and implement an experiment that applies our smartphones as input devices or sensors. Get creative but keep in mind that your research question should somewhat fall within the bigger scope of Cognitive Science. You can collect data and behaviour from a single device or think of a crowd-based experiment.

Materials

Start by getting familiar with phyphox (https://phyphox.or). You can also browse through some of the experiments they already provide (https://phyphox.org/de/experiment/) and have a look at how they make the data from one phone accessible via the network (https://phyphox.org/remote-control/).

We have prepared a local network for you within which you can also make use of the remote access phyphox provides. The idea is that each phone can publish its collected data in a live-stream via a simple REST API that you can access through a browser or a self-written backend. We have also provided an example in python.

Recommended Prerequisites

- Creativity
- Basic programming experience (any language that supports web-technologies)
- Basic understanding of network communication can be advantageous

Material

Router and local network

As you need to make your phones accessible over the network we provide a local network with one of our routers. Find here the general network information:

- Wifi name: IICCSSS_hackathon_local
  Wifi password: tuda-iiccsss
- Default Gateway to reach the router interface
  IP: 192.168.50.1
  user: hackathon_admin
  password: topic_3

Example script in python

In the folder example you'll find a simple python script to get you started. It provides a simple utility to plot live data from multiple phones and is meant to give you an idea of how to approach network communication.

The script takes a list of IP address of the connected phones running phyphox with the experiment "audio oszilloscope". The script queries the data of each device and creates and updates a plot for each.

The scripts requirements (very few) are listed in requirements.txt