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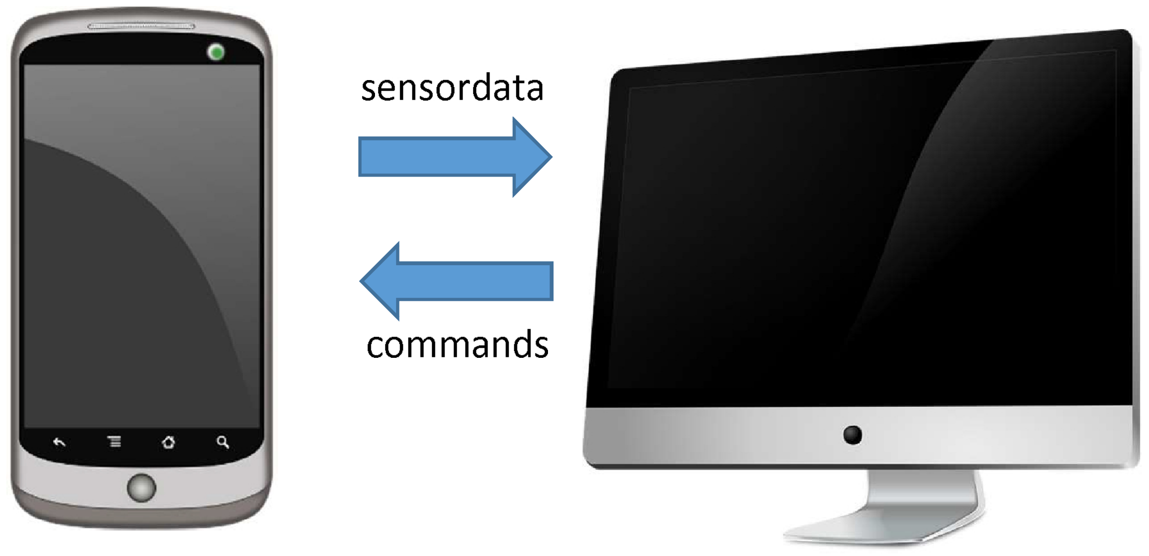
Smartphone Gamepad Framework

Goal: Create an API, that allows an easy usage of any smartphone as a controller on every average computer.



Realization: The sensor data is collected from the smartphone, filtered and processed, and finally sent via wireless connection to the server

Advantage: The smartphone is a very intuitive device and in combination with the SGF usable in a way only modern high-prized consoles provide.

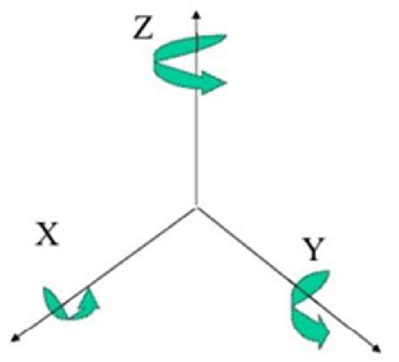
Data extraction

Every average smartphone has a number of sensors, that continuously **observe the surrounding** environment. This data can be extracted from the device via **JavaScript**. For this purpose, some newly available **APIs** were used:

Rotation and Acceleration .

The mostly used sensor data is the **movement in 3-dimensional space**. This information is collected via an intern gyroscope and accelerometer in a fixed interval **several times every second**. The easiest way to collect this is the **Eventlistener '***devicemotion***'**, as shown in the following example:

```
window.addEventListener('devicemotion', function  (event){
    var accX = event.acceleration.x; //high, down
    var rAlpha = event.rotationRate.alpha; //rotation alpha
```



Further Sensors in SCI: **Audio and Video** via getUserMedia() API

Battery Information via Battery Status API

Orientation

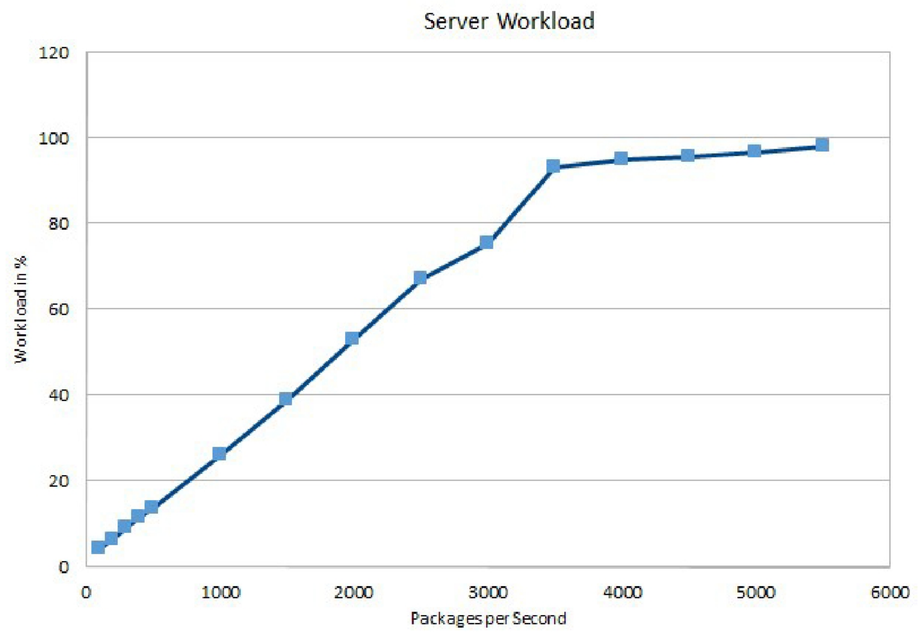
Data processing

To **lower the amount** of data sent over the network, the data is first **filtered**. For this, two steps are of great importance:

Filtering of empty/unused data packages

Averaging of several packages to one

These steps are necessary, as a currently normal interval of **50ms** and higher would overload the **UDP** connection used.

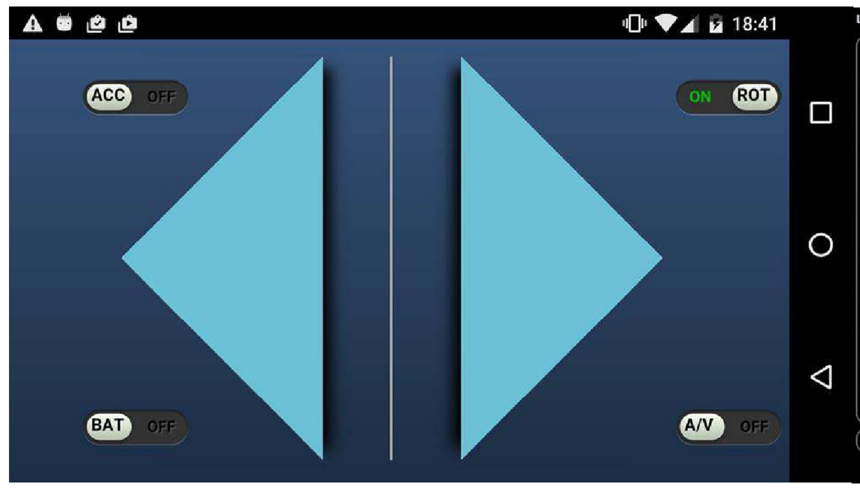


Currently the application supports **70 devices** at an interval of 10 updates a second

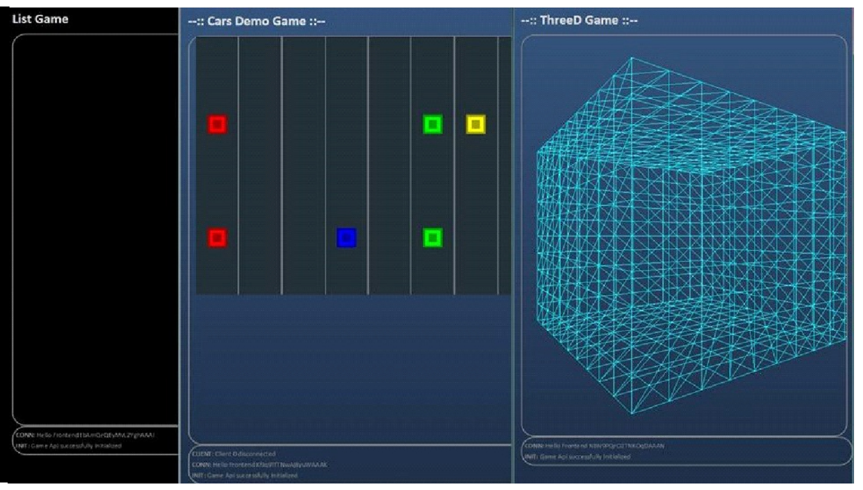
Result and Outlook

The resulting application is able, after starting it within the browser, to **take the sensor data** from the smartphone and **use it for operations** on the desktop PC. This can be used for **presentations**, **games** and several other fields, as the **intuitive movement** makes every scenario imaginable.

Three example games and several templates for the gamepad were created:



Controller Template



Example games

Outlook

- Possibility to create an **App** out of the API and detach it from the browser
- Extend functionality to several available Sensors currently unused (light, humidity, …)
- Peaks in server workload