# Water saving and leakage protection system

## **Category**: Smart Homes


## Group 2:

Aleksandar Calovic

Stephan Stofer

Nico Bosshard

Victor Kozlov


## Motivation

Our aim is to invent a new environmentally beneficial tool. Leaking taps and flushes are a big problem for buildings. In order to save water and avoid damages we will create an IoT project which will monitor the drains in the building. With our solution we can help housekeepers and families keeping an eye on the water circulation and give them the possibility to react as soon as there is a leakage.

## Approach

We will create a real time monitoring system, that gets data from the sensors of drains, taps or toilet flushes. To realize our project, we need following components. Some of them will be provided by a team member, these are marked by a «nb».

List of Items:

| Quantity | Item | Provided by |
|---|---|---|
| 3 | Water Sensors | Nb |
| 3 | Amplified Piezo for noise/vibration measurements | Nb |
| 3 | ADC voltage measurement for low resistance conductivity measurements | Nb |
| 3 | High Voltage pulses for high resistance conductivity measurements | Nb |
| 3 | Espressif esp32 | An |
| 3 | Power adapter for Batterie | An |
| 1 | Raspberry Pi Zero W | An |
| 1 | mini hdmi to hdmi cable | An |
| 1 | USB Micro power Adapter for Pi Zero W | An |

*Abbr: «Nb» Nico Bosshard, «An» Prof. Dr. Angela Nicoara*

## Techniques

By using amplified piezos we try to detect the noise and the vibration of running water while with different methods of conductivity measurement we will detect actual leakages. A microcontroller transmits the data to an edge computing system. There the data gets processed and an email will be sent as soon as exceeding a threshold.

## Evaluation

We will also do an experiment in order to test our system in the real world.