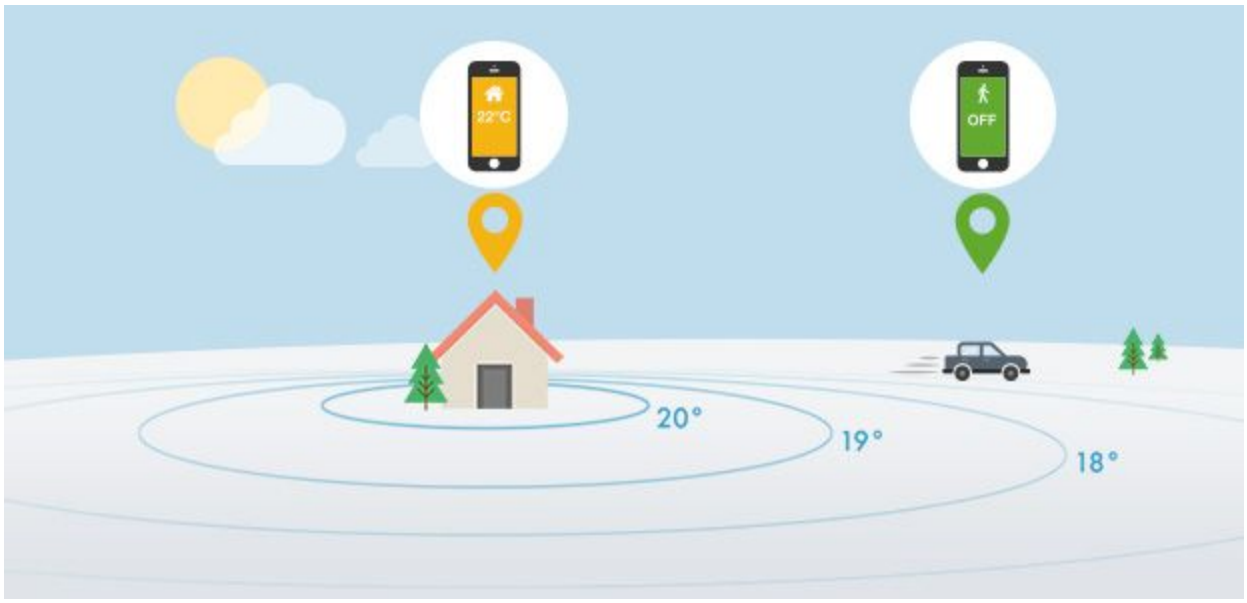
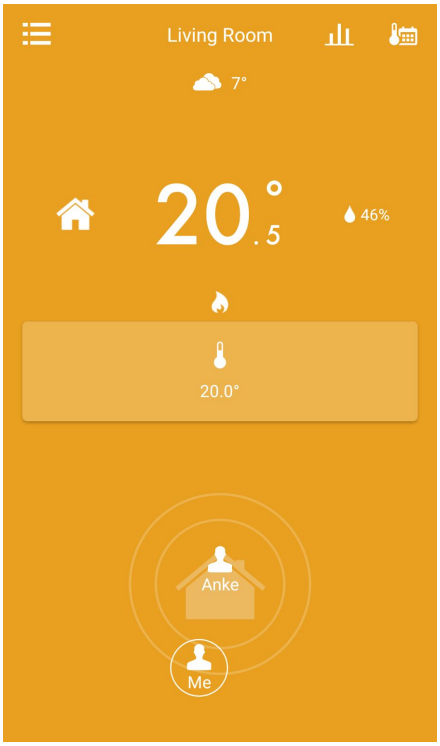
Experience Day Task: “User Radar”



tado° uses location-based control to automatically control the heating or air conditioning. tado° recognises whether a resident is at home, is leaving the house or is on the way back home. In the resident's absence the tado° automatically turns down the heating and if one resident is on his way back home it will start heating again.
[Smart heating control by tado° – with presence detection (Video)]

A customer’s account - what we call a tado° home - usually includes multiple residents that influence the heating behavior. For simplicity we assume that each customer has one mobile device that reports a geolocation. The geolocation of all residents it then used to deduce whether heating should be on or off.



Each resident can check the current state on his mobile device by looking at what we call the **User Radar**.

The User Radar shows all residents of the home and whether they are at home or not. The farther a resident is from home the farther away he is from the house in the middle. Though the User Radar only shows abstract positions, the angle at which the resident is placed on the radar is calculated from the actual geolocation.

General Information

The general task is to implement a User Radar the renders the position of a home's residents based on their current location. The tado° mobile application and the web application use an API to get the list of mobile devices and their location information from our backend to render this radar - `https://my.tado.com/api/v2/homes/59391/mobileDevices`
You can see an example of the radar in the mobile app (screenshot above) or on the web application at https://my.tado.com/webapp/#/home-control/position.

As already mentioned the API returns abstract information about the residents location. Here is an example response with only one resident / mobile device:


```
[
    {
        "name": "tom",
        "id": 207345,
        "settings": {
            "geoTrackingEnabled": true
        },
        "location": {
            "stale": false,
            "atHome": false,
            "bearingFromHome": {
                "degrees": 192.25,
                "radians": 3.36
            },
            "relativeDistanceFromHomeFence": 0.4
        }
    }
]
```


The response contains an array of mobile devices with the following properties:

name	The residents nickname. This name is placed below the icon in the User Radar.
id	The residents unique id.
settings	Mobile device specific settings. This currently only contains whether the device has enabled geolocation or not.
location	This represents the location information that the client (mobile application or web application) uses to render the User Radar. It can be `NULL`, if the resident has never reported a geolocation.

	If a location has been reported, it contains information whether the location is recent and if the resident is considered to be at home or away. The values of `bearingFromHome` and `relativeDistanceFromHomeFence` are used to position the resident on the User Radar. `bearingFromHome` is a double value that is calculated from the geolocation of the resident and the geolocation of the home. `relativeDistanceFromHomeFence` is a double value between 0 and 1. It marks the residents distance to the home on a logarithmic scale with a maximum value of 1.

Tasks

Retrieve the current positions of all residents and implement a User Radar that allows for positioning the residents according to the distance from home.

1. Implement a simple radar component using the mockup API response (see below)
    - Position residents according to their distance and bearing
2. Retrieve the actual resident locations via the API and connect it to the radar component
    - `https://my.tado.com/api/v2/homes/59391/mobileDevices?username=<MobileDeviceUsername>&password=<Password>`
    - Load initial state on page load
    - Update resident positions every 5 seconds
    - See the testing section for information on how to influence the geolocation of the home
3. Extend the radar component (These tasks are additional and you don't need to finish them. Tackle them only if you have enough time left. If time is running short, rather think about the questions mentioned in 4.)
    - Highlight the current resident. You can get the current resident's ID for the check by adding the query parameter `appUserUsername` to the `mobileDevices` API call. For example: `https://my.tado.com/api/v2/homes/59391/mobileDevices?username=59391_nick&password=MWIwYjAwZGYtODU5OS00YWU1LTllZjgtOWQ2OGZhMWNhYjI5&appUserUsername=59391_nick`
    - Group residents that are the same distance and angle to home, but always show the current resident individually.
    - Show residents that are not reporting a geolocation (`geoTrackingEnabled == false`) or do not have a location yet (`location == null`) on the side of the radar.
4. Consider some of the following points for the following discussion

- How can the component scale and adapt on different device sizes (mobile, desktop, 4k, …)?
- Can the component be reused in different scenarios? What information could be hidden or shown, if there is more space available? For example on a small scale on the application main screen and a large version on a dedicated page.
- How can the component be tested?

Account Information

my.tado.com

Username: timo.mueller+userRadar@tado.com
Password: userRadar1234

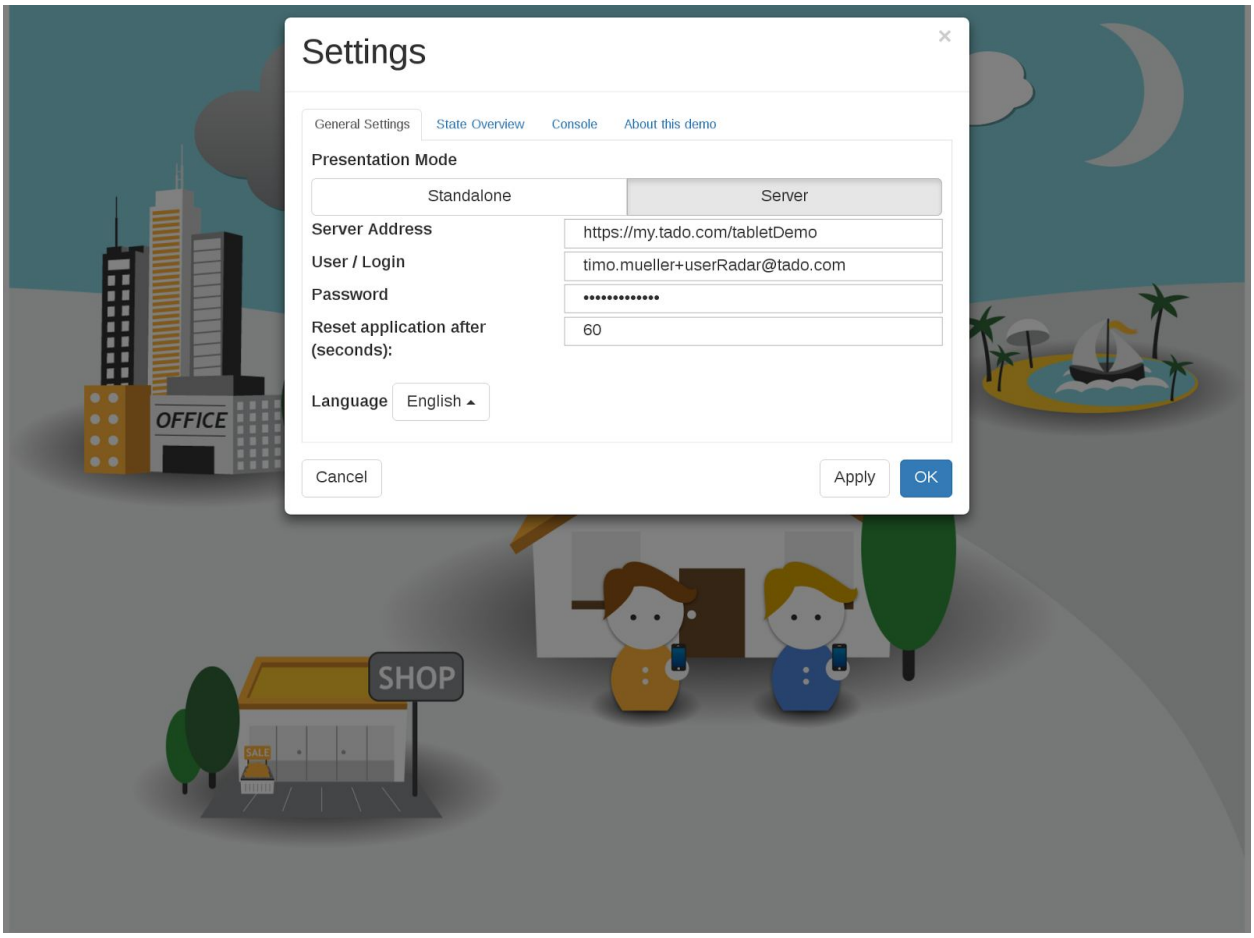
Resident / Mobile Device:

Username	Password
59391_TabletCharacter_2	<Login not possible>
59391_TabletCharacter_1	<Login not possible>
59391_nick	MWIwYjAwZGYtODU5OS00YWU1LTllZjgtOWQ2OGZhMWNhYjI5
59391_ina	Yzg5OTI2ZGEtNDlmZS00M2U4LTk2NmUtNjhmMDczOTU4OTk3
59391_petra	OGRlYjRjZTItM2FkMi00NjAxLTk4YzQtZGNhYTExN2VlNzg4

Demo Application Testing

Once you have connected the API to your component (or if you just want to play around with the geolocation), you can use our demo application to move the residents marked as DemoApp residents around by dragging them to the different locations.

Before you start you have to setup the application, go to https://my.tado.com/demoapp/ and double-click the Office to open the configuration modal. Select the presentation mode “Server”, enter the my.tado.com credentials and apply.


Settings
General Settings
State Overview
Console
About this demo
Presentation Mode
Standalone
Server
Server Address
https://my.tado.com/tabletDemo
User / Login
timo.mueller+userRadar@tado.com
Password
Reset application after (seconds):
60
Language
English
Cancel
Apply
OK
OFFICE
SHOP
SALE

Mockup API Response


```
[
    {
        "name": "tom",
        "id": 207345,
        "settings": {
            "geoTrackingEnabled": true
        },
        "location": {
            "stale": false,
            "atHome": false,
            "bearingFromHome": {
                "degrees": 192.25,
                "radians": 3.36
            },
            "relativeDistanceFromHomeFence": 0.4
        }
    },
    {
        "name": "ina",
        "id": 207348,
        "settings": {
            "geoTrackingEnabled": true
        },
        "location": {
            "stale": false,
            "atHome": true,
            "bearingFromHome": {
                "degrees": 218.25,
                "radians": 3.81
            },
            "relativeDistanceFromHomeFence": 0
        }
    },
    {
        "name": "petra",
        "id": 207349,
        "settings": {
            "geoTrackingEnabled": true
        },
        "location": {
            "stale": false,
            "atHome": false,
            "bearingFromHome": {
                "degrees": 92.15,
                "radians": 1.61
```

```
            },
            "relativeDistanceFromHomeFence": 0.2
        }
    },
    {
        "name": "luke",
        "id": 207351,
        "settings": {
            "geoTrackingEnabled": true
        },
        "location": {
            "stale": false,
            "atHome": false,
            "bearingFromHome": {
                "degrees": 89.23,
                "radians": 1.56
            },
            "relativeDistanceFromHomeFence": 0.24
        }
    }
]
```