



Tongji University

课题名称：Guide System for the Fourth Floor of Jishi Building

副 标 题：用户交互技术作业4

学 院：计算机科学与技术学院

专 业：软件工程

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1 Project Overview

This project aims to develop a guide system for the fourth floor of Jishi Building, providing users with navigation services for the rooms on this floor. It supports floor overview, quick room location, and keyword search to help users understand the functions and occupants of each room.

2 Project Requirements

2.1 Functional Requirements

- **Floor Overview**

Provide a visual floor plan of the fourth floor of Jishi Building, showing the location and number of each room.

- **Room Selection and Viewing**

Users can click on a room in the floor plan to view its details. The system displays the room number, function, and occupants at the corresponding location.

- **Keyword Search**

Support keyword search by room number, function, or occupant name to quickly locate relevant rooms or personnel.

2.2 Technical and Design Requirements

- **Static Webpage**

Design a static webpage as the interface for the guide system.

- **Interface Layout**

Design the layout based on the principle of "**Fluid Navigation**" to ensure users can intuitively and easily use the system, enhancing user interaction experience.

3 Design Principles and Rationale

This system is designed based on the principle of **Fluid Navigation** to reduce the learning cost, improve interaction efficiency, and ensure a smooth, user-friendly experience. The rationale for the layout and interaction is as follows:

- **Intuitive Layout and Structure**

An intuitive layout lowers the understanding barrier, helping users quickly grasp the structure of the application and find required functions. This includes clear visual hierarchy, appropriate spatial separation, and obvious navigation markers to help users identify actionable elements and navigation paths. Therefore, the main interface directly displays a floor map of Jishi Building's fourth floor, showing room numbers and layout. Rooms matching the search results are highlighted; the search box is clearly placed at the top without needing to access dropdown menus.

- **Minimized Cognitive Load**

Reduce the amount of information users need to memorize by simplifying the operation process and interface elements. For example, using icons instead of text, adopting common UI patterns, all help users quickly understand and operate the system. Thus, this system uses commonly recognized icons for restrooms and staircases, and icon + text for student areas. Functional rooms are marked with room numbers. The top search bar suggests keyword types and allows search via both Enter key and Search

button—conforming to typical user habits. A prompt at the bottom-right guides users to click to view room info, reducing exploration difficulty.

- **Consistency**

Maintaining consistency in interface design enhances user memory, reduces confusion, improves overall efficiency, and optimizes the experience. This includes consistency in colors, fonts, layout, and interactions. Therefore, this system uses a green color theme; matched rooms are highlighted in dark green—conspicuous but not intrusive. Viewing room info is done by clicking on the room, with information displayed at its location to reduce confusion.

- **Dynamic Interaction**

Use animations and transitions to enhance the experience. Appropriate effects not only beautify the interface but also guide user attention and indicate interface changes. For example, smooth transitions during view switches or content loading give a sense of continuity, avoiding abrupt changes.

4 Project Showcase

4.1 Startup Interface

Click the **Enter** button to enter the guide interface.



4.2 Interactive Interface

4.2.1 Initial State



4.2.2 Click on Room Number to View Room Info

Information boxes are shown near the selected room, minimizing eye movement and focus shift. No need to look for info elsewhere.

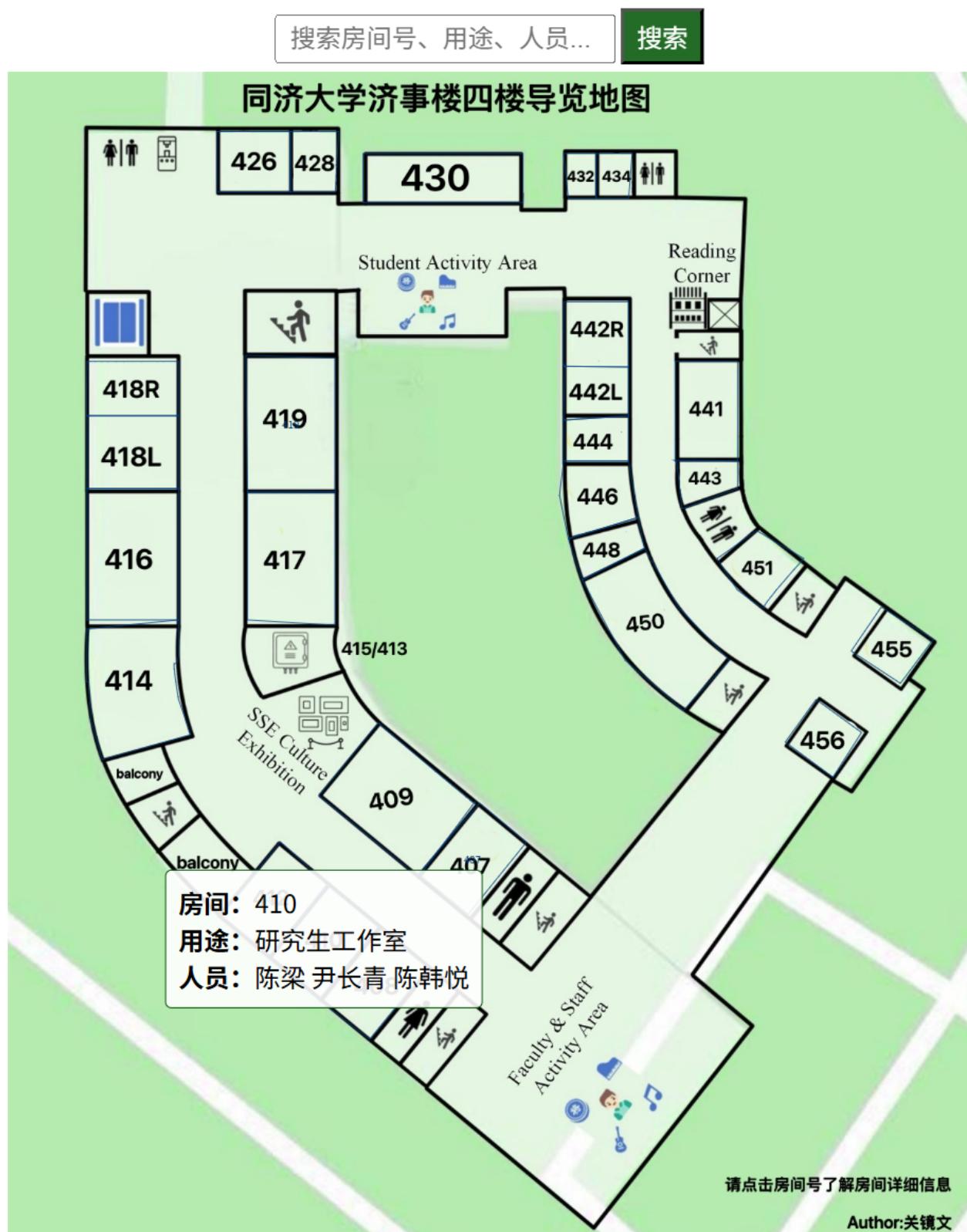
- **View Room 419**



- View Room 450



- View Room 410



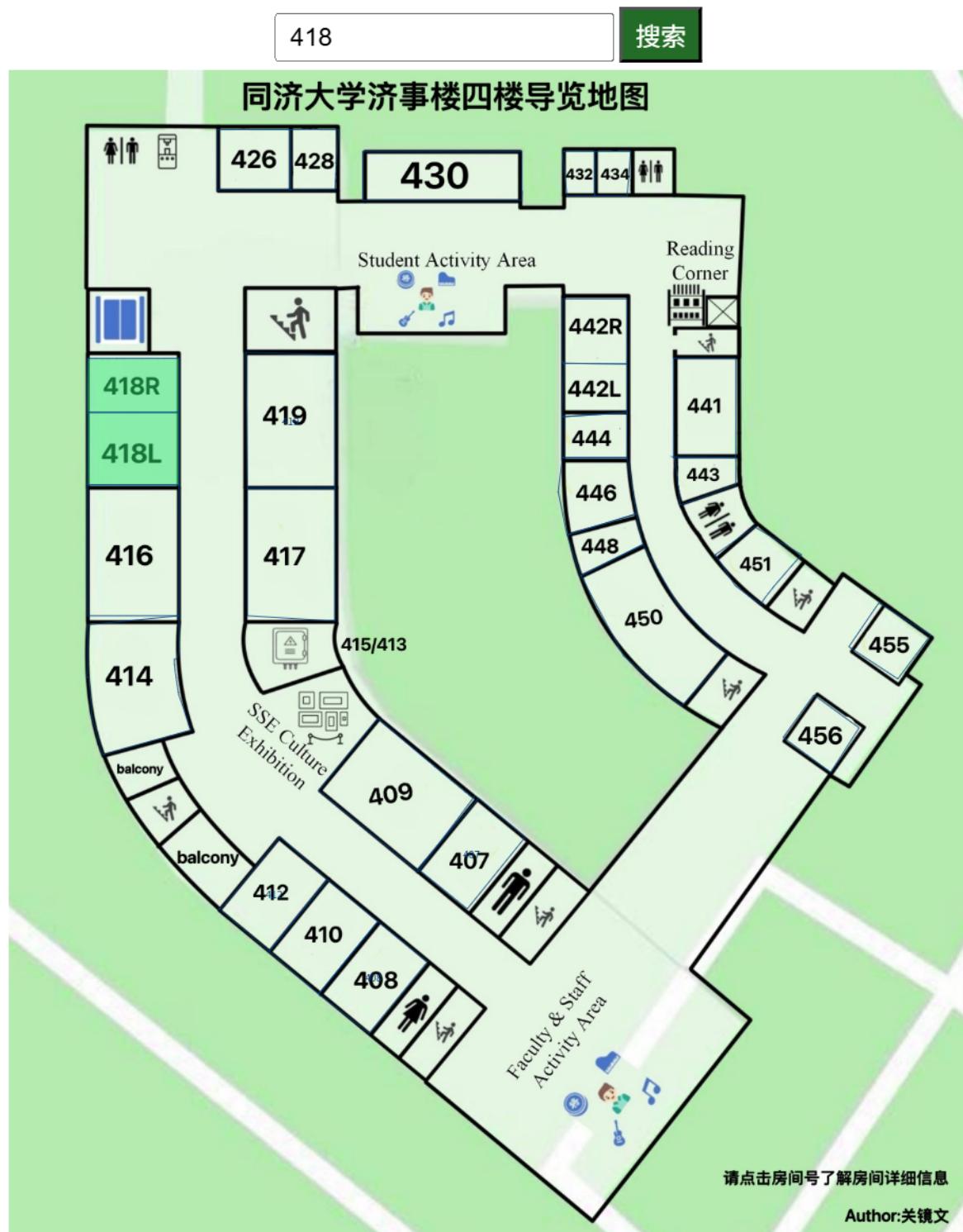
4.2.3 Search by Keyword to View Room Info

The search bar suggests keyword types. Users can press Enter or click the search button to perform the search. Matched rooms are highlighted; click to view info. If no match is found, a popup will appear. Fuzzy matching and case-insensitive search are supported.

4.2.3.1 Click on Room Number to View Room Info

- **Enter 418**

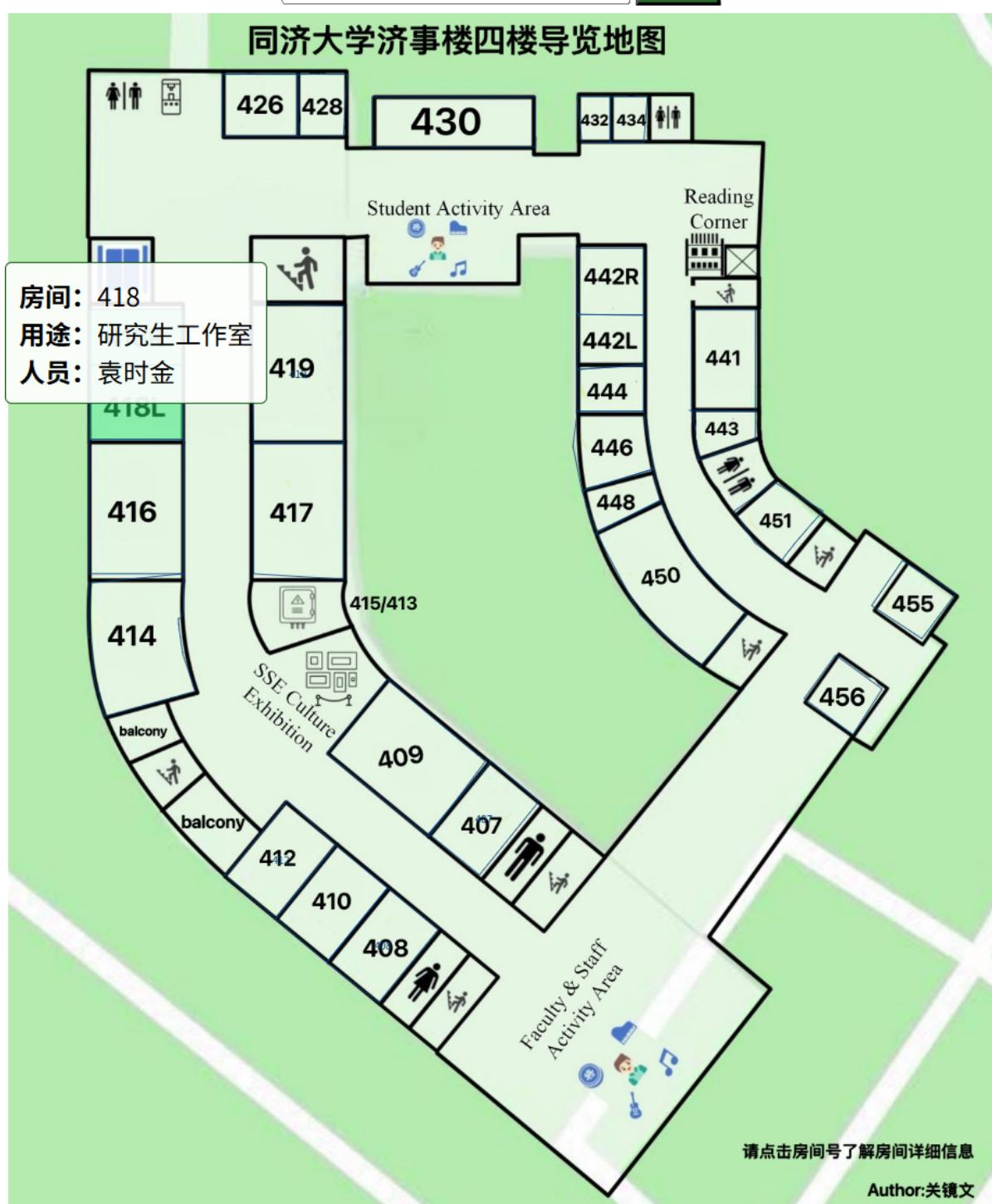
Both Room 418R and 418L are highlighted.



Click to view info.

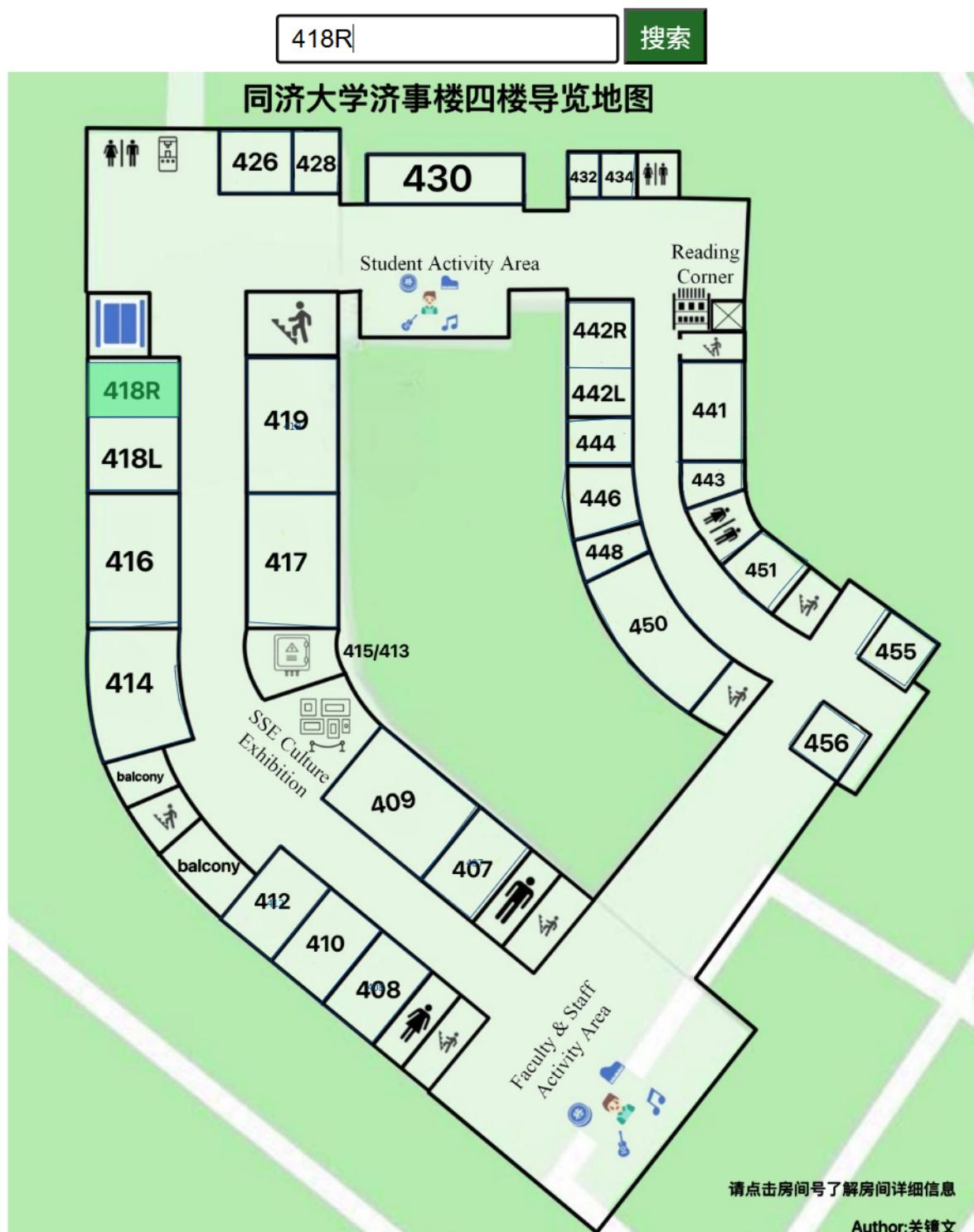
418

搜索



- Enter 418R

Room 418R is highlighted.



- Enter 442r

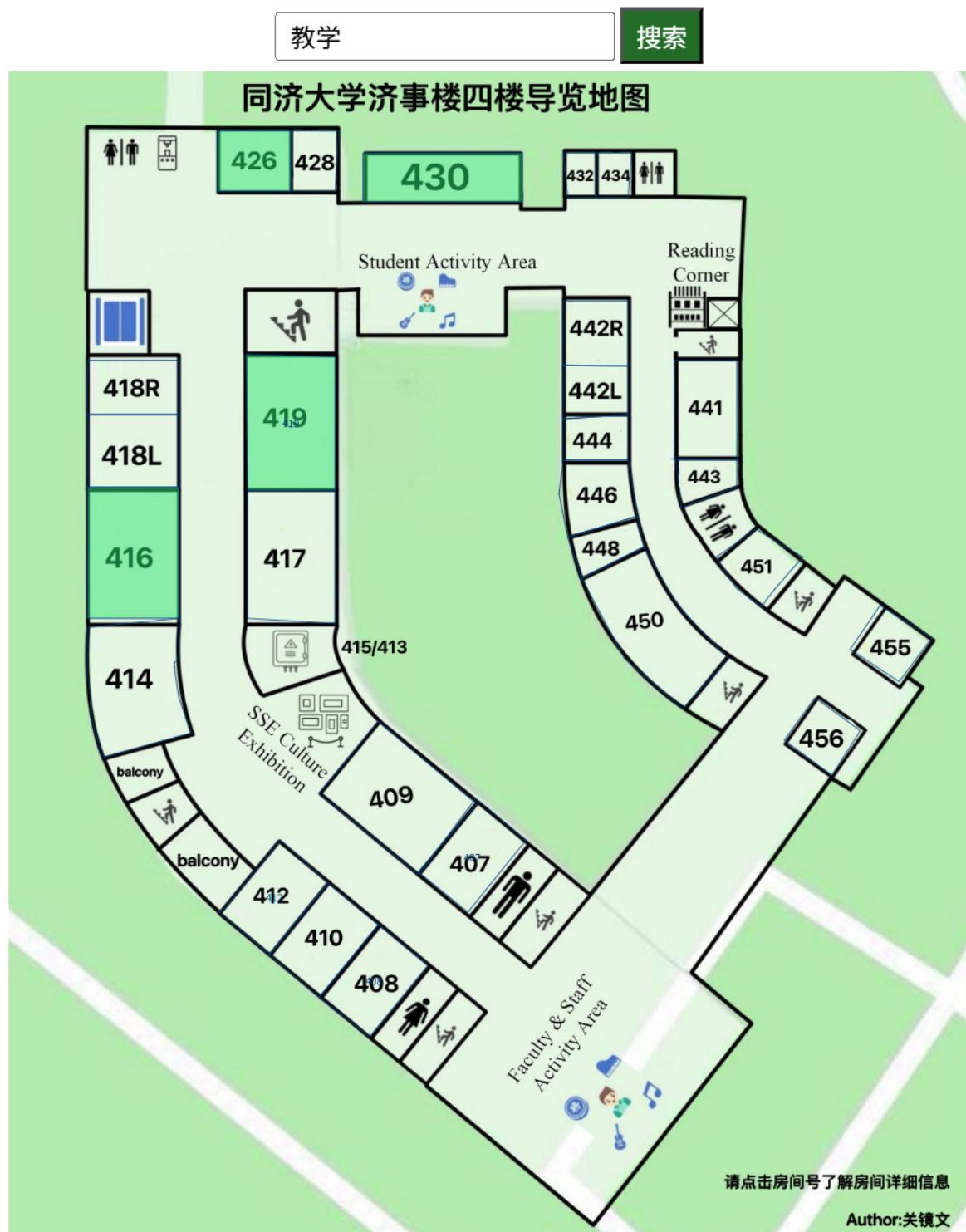
Room 442R is still matched.



4.2.3.2 Search by Room Function

- Enter 教学

Multiple rooms are matched.



Multimedia teaching room.

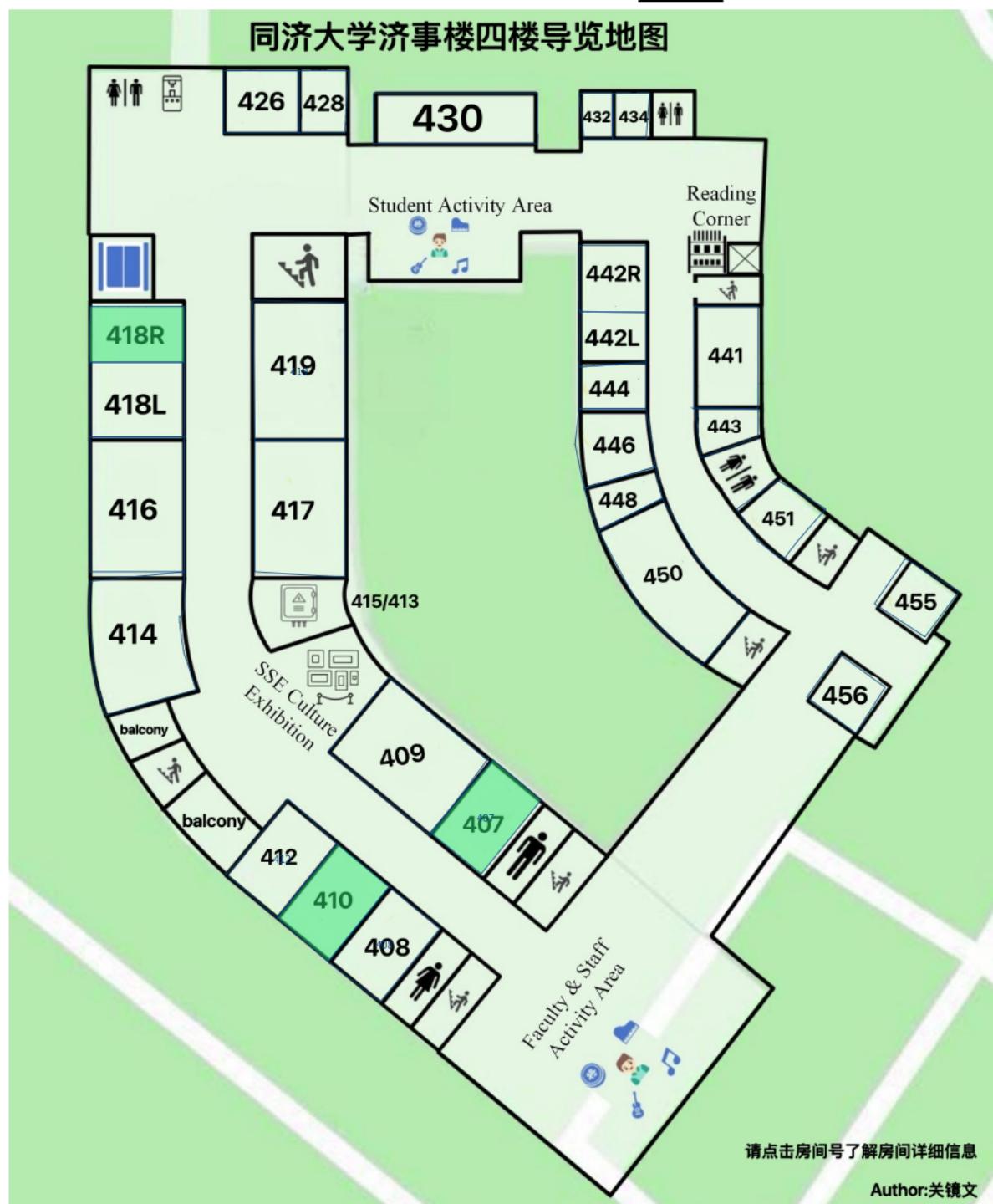


Teaching lab.



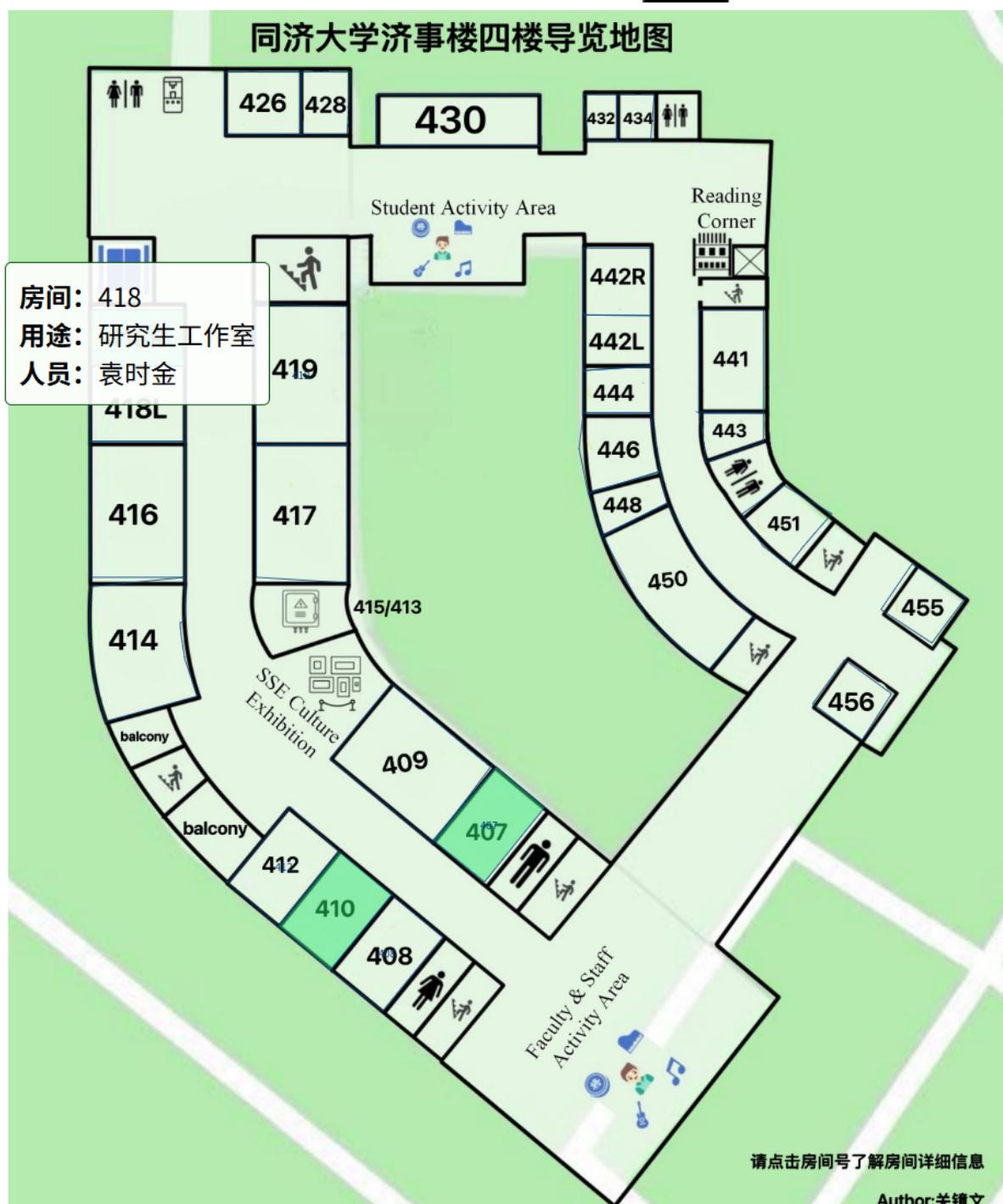
- Enter研究生工作室

Multiple rooms are matched; all can be clicked to view info.







4.2.3.3 Search by Personnel Name

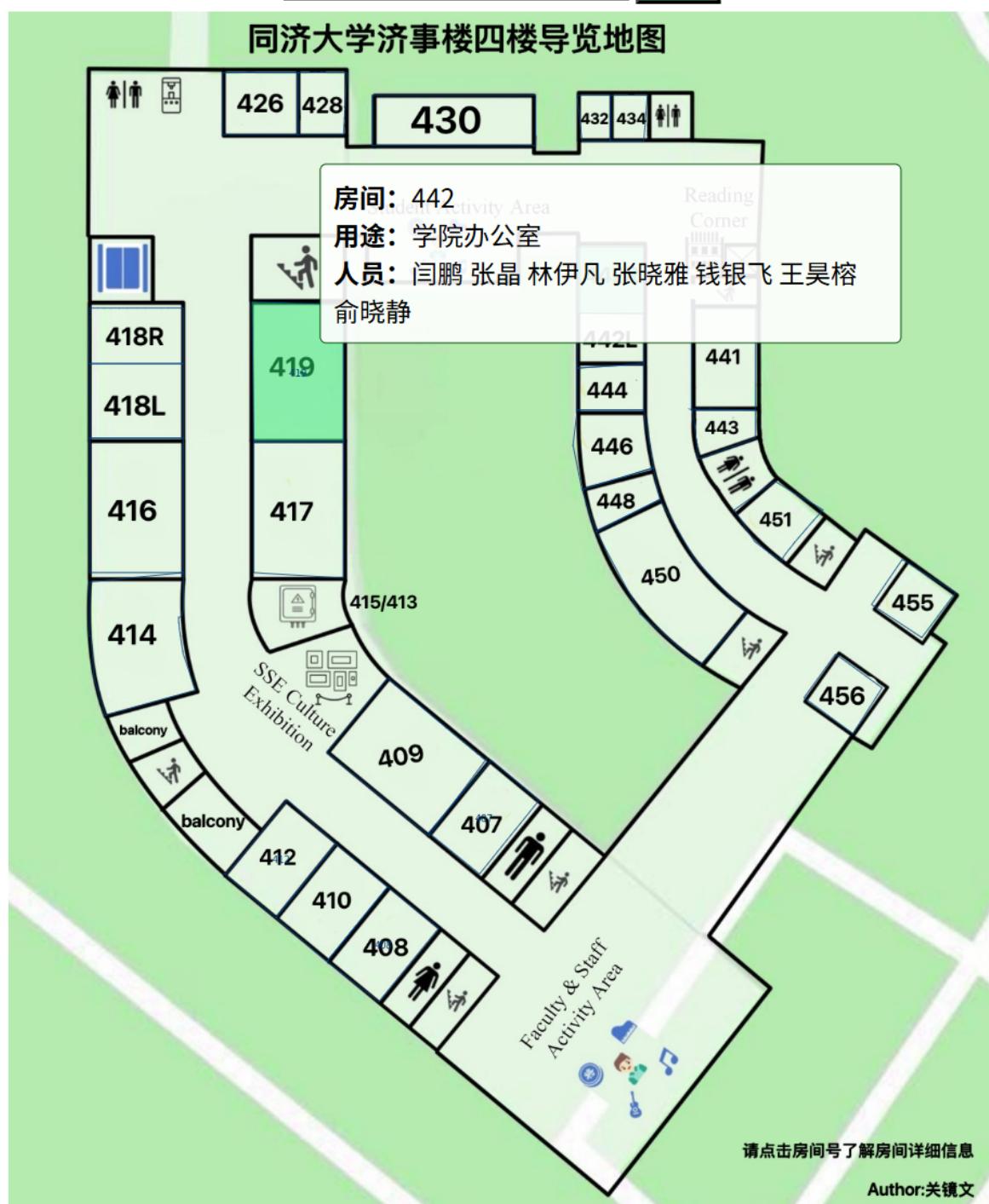
- Enter 张晶

Multiple rooms are matched.



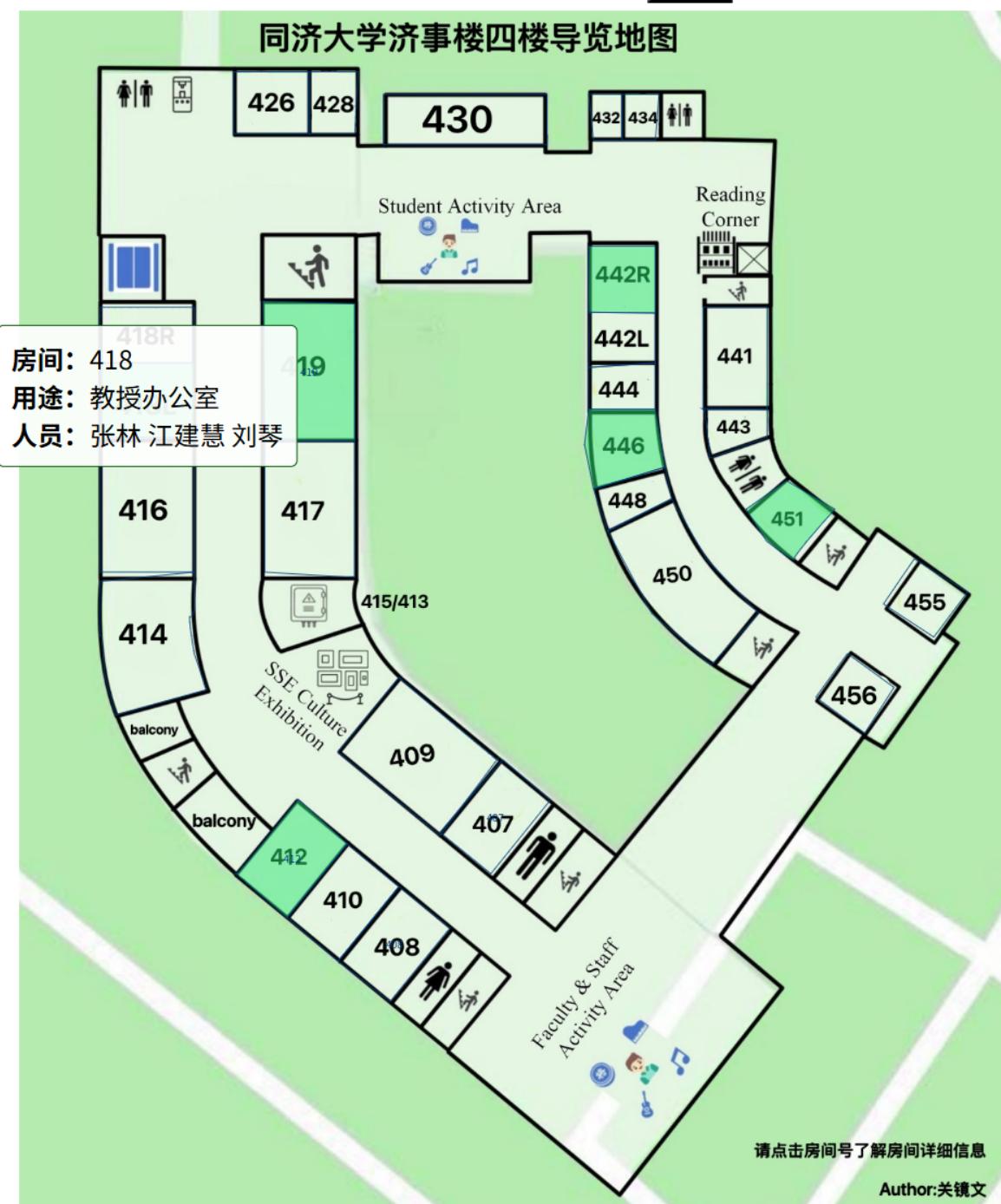
同济大学济事楼四楼导览地图





- Enter 张

Multiple rooms are matched—all with someone surnamed Zhang.





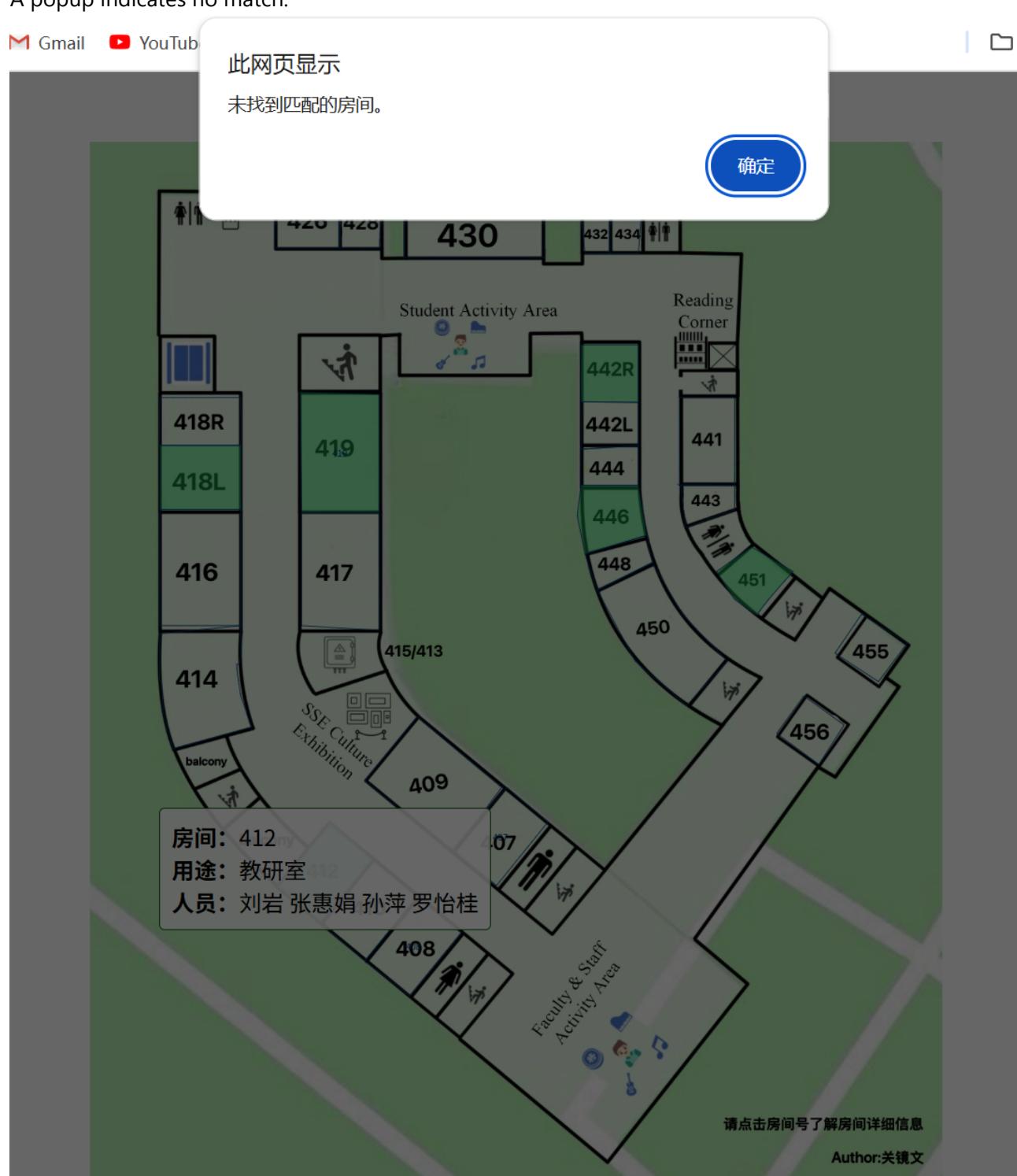


4.2.3.4 No Matching Result

- Enter 469

A popup indicates no match.

Gmail YouTube



5 Code Showcase

5.1 style

```
<style>
  body,
  html {
    margin: 0;
    padding: 0;
    height: 100%;
  }

  /* — 启动屏 — */
  #startup-screen {
    position: fixed;
    top: 0;
    left: 0;
    right: 0;
    bottom: 0;
    background: url('bg.jpg') no-repeat center center;
    background-size: cover;
    display: flex;
    align-items: center;
    justify-content: center;
    z-index: 1000;
  }

  #startup-content {
    text-align: center;
    color: #fff;
  }

  #startup-content h1 {
    margin-bottom: 1rem;
    font-size: 2rem;
  }

  #enter-btn {
    padding: 0.5rem 1.5rem;
    font-size: 1rem;
    background: #055408;
    color: #fff;
    border: none;
    border-radius: 4px;
    cursor: pointer;
  }

  #enter-btn:hover {
    background: #0a6d0f;
  }
</style>
```

```
/* — 搜索框 — */
#search-box {
    position: fixed;
    top: 10px;
    left: 50%;
    transform: translateX(-50%);
    z-index: 900;
}

#search-box input {
    padding: 4px 8px;
    font-size: 1rem;
}

#search-box button {
    padding: 4px 8px;
    font-size: 1rem;
    color: #fff;
    background: rgba(11, 92, 15, 0.9);
}

/* — 地图容器 — */
#container {
    position: absolute;
    top: 50px;
    left: 0;
    right: 0;
    bottom: 0;
    overflow: auto;
    /* 开启滚动条 */
}

svg {
    width: 100%;
    height: 100%;
    display: block;
}

.room-area {
    fill: transparent;
    stroke: #004080;
    stroke-width: 2;
    cursor: pointer;
    transition: fill .2s;
    pointer-events: all;
}

.room-area:hover {
    fill: rgba(43, 229, 114, 0.3);
}

.room-label {
    font-size: 24px;
    fill: #004080;
}
```

```
pointer-events: none;
text-anchor: middle;
dominant-baseline: central;
}

#info-box {
position: absolute;
background: rgba(255, 255, 255, 0.9);
padding: 8px;
border: 1px solid #055408;
border-radius: 4px;
display: none;
transform: translate(-50%, -110%);
z-index: 950;
}
</style>
```

5.2 script

```
<script>
// — 1. “进入”按钮：点击后隐藏启动屏 —
document.getElementById('enter-btn').addEventListener('click', () => {
    document.getElementById('startup-screen').style.display = 'none';
}, 2000);
// 2. 搜索功能：回车或点击时触发对应房间点击
document.getElementById('search-form').addEventListener('submit', function (e)
{
    e.preventDefault();
    const keyword = document.getElementById('search-
input').value.trim().toLowerCase();
    const rooms = document.querySelectorAll('.room-group');

    if (!keyword) return;

    let found = false;

    rooms.forEach(room => {
        const roomNum = room.dataset.room?.toLowerCase() || '';
        const type = room.dataset.type?.toLowerCase() || '';
        const occupant = room.dataset.occupant?.toLowerCase() || '';

        // 判断是否匹配关键词
        if (roomNum.includes(keyword) || type.includes(keyword) ||
occupant.includes(keyword)) {
            highlightRoom(room);
            found = true;
        } else {
            resetRoom(room);
        }
    });
});
```

```

if (!found) {
    alert('未找到匹配的房间。');
}
});

function highlightRoom(room) {
    const area = room.querySelector('.room-area');
    if (area) {
        area.style.fill = 'rgba(43, 229, 114, 0.5)';
    }
}

function resetRoom(room) {
    const area = room.querySelector('.room-area');
    if (area) {
        area.style.fill = 'transparent';
    }
}

// 3. 现有的房间标签定位 + 点击弹窗逻辑
var data = {
    '407': { room: '407', type: '研究生工作室', occupant: '陈梁 严海洲 叶珂男' },
    '408': { room: '408', type: '无标签办公室', occupant: '暂无' },
    '409': { room: '409', type: '教育部工程研究中心实验室', occupant: '陈梁 朱亚萍  
代玉琢 杜庆峰 韩永琦' },
    '410': { room: '410', type: '研究生工作室', occupant: '陈梁 尹长青 陈韩悦' },
    '412': { room: '412', type: '教研室', occupant: '刘岩 张惠娟 孙萍 罗怡桂' },
    '413': { room: '413', type: '弱电间', occupant: '暂无' },
    '414': { room: '414', type: '硬件实验室', occupant: '暂无' },
    '415': { room: '415', type: '强电间', occupant: '暂无' },
    '416': { room: '416', type: '多媒体教学机房', occupant: '陈梁 杨旻' },
    '417': { room: '417', type: '会议室', occupant: '暂无' },
    '418L': { room: '418', type: '教授办公室', occupant: '张林 江建慧 刘琴' },
    '418R': { room: '418', type: '研究生工作室', occupant: '袁时金' },
    '419': { room: '419', type: '教学实验室', occupant: '陈梁 张晶' },
    '426': { room: '426', type: '多媒体教学机房', occupant: '陈梁 杨旻' },
    '428': { room: '428', type: '服务器机房', occupant: '杨旻' },
    '430': { room: '430', type: '多媒体教学机房', occupant: '陈梁 杨旻' },
    '432': { room: '432', type: '党员之家', occupant: '暂无' },
    '434': { room: '434', type: '多媒体教室', occupant: '杨旻' },
    '441': { room: '441', type: '会议室', occupant: '暂无' },
    '442L': { room: '442', type: '教务办公室', occupant: '刘梦露 李慧敏 王彩霞 杨  
丹 姚仕仪' },
    '442R': { room: '442', type: '学院办公室', occupant: '闫鹏 张晶 林伊凡 张晓雅  
钱银飞 王昊榕 俞晓静' },
    '443': { room: '443', type: '实验中心', occupant: '陈梁 杨旻 严海洲' },
    '444': { room: '444', type: '档案室', occupant: '暂无' },
    '446': { room: '446', type: '学生工作办公室', occupant: '张砚秋 丁瑞庭 葛蕾 焦  
嘉欣 钟梦莹 陈璞皎' },
    '448': { room: '448', type: '副书记办公室 院务助理办公室', occupant: '陈荣 吴晓  
培 宋井宽' },
    '450': { room: '450', type: '(左) 党委书记办公室 (右) 院长办公室', occupant:  
'(左) 熊岚 (右) 申恒涛' },
    '451': { room: '451', type: '副院长办公室', occupant: '王成 何良华 张林' },
    '455': { room: '455', type: '会议室', occupant: '暂无' },
    '456': { room: '456', type: '党委办公室', occupant: '周微微 陆凤兰 赵清理' }
}

```

```
};

const svg = document.getElementById('mapSvg');
const infoBox = document.getElementById('info-box');
const container = document.getElementById('container');
// 4. 自动给每个房号标签算中心并定位
svg.querySelectorAll('.room-group').forEach(group => {
    const shape = group.querySelector('.room-area');
    const bbox = shape.getBBox();
    const cx = bbox.x + bbox.width / 2;
    const cy = bbox.y + bbox.height / 2;
    const label = group.querySelector('.room-label');
    label.setAttribute('x', cx);
    label.setAttribute('y', cy);
});
// 5. 绑定点击事件，弹出信息框
svg.querySelectorAll('.room-group').forEach(group => {
    group.addEventListener('click', e => {
        const r = group.dataset.room;
        infoBox.querySelector('.room').textContent = data[r].room;
        infoBox.querySelector('.type').textContent = data[r].type;
        infoBox.querySelector('.occupant').textContent = data[r].occupant;
        const shape = group.querySelector('.room-area');
        const bbox = shape.getBBox();
        const pt = svg.createSVGPoint();
        pt.x = bbox.x + bbox.width / 2;
        pt.y = bbox.y + bbox.height / 2;
        const loc = pt.matrixTransform(shape.getScreenCTM());
        infoBox.style.left = loc.x + 'px';
        infoBox.style.top = loc.y + 'px';
        infoBox.style.display = 'block';
        e.stopPropagation();
    });
});
// 6. 点击空白隐藏
container.addEventListener('click', () => {
    infoBox.style.display = 'none';
});
</script>
```

6 Project Improvement Ideas

6.1 Add Responsive Design

- Ensure the webpage displays well on different devices, such as mobile phones, tablets, and desktops.

6.2 Enhance User Experience

- Add real-time search suggestions to guide users with possible room numbers, teachers, or offices. For example, when the user types 41, a dropdown suggests possible entries like 410, 411, 412, etc.

6.3 Optimize Interaction Animations

- Use CSS animations and transitions to improve the smoothness of interface changes and enhance the user experience.

6.4 Enrich Interactive Content

- Consider developing a dynamic webpage that allows users to provide feedback and submit real-time updates.