Sprint: 1

From: 04/08/2024 – 04/19/2024

Team: ERA: Emergency Response Assist

Team Member	Tickets	Points
Jatin Madan	2	8
Vaishnavi Sunil Desai	1	4
Isha Ghiria	1	2
Sharvesh Patki	1	4

Sprint Overview:

| Planned		Completed	
Items	Points	Items	Points
5	18	3	10

Sprint Retrospective:

- What have you done during this sprint?
    - Jatin Madan
        - Jatin worked on finalizing the Architecture of the ERA system, identifying all 7 submodules that will be implemented to complete the functionality of the system.

User Input Interface
- Input Floor Map
- Input Access Point Metadat
- Input Audi Sensor Metadata

Network Logs Analyzer
- Connect to Centralized Logging Server
- Identify Users and Locations
- Identify Unknown Devices

Acoustic Sensor Analysis
- Connect to the Acoustic Sensor Interface
- Evaluate incoming audio signals for gunshot detection

User Localisation
- Triangulate User Location
- Initiate Affected Device Live Tracking

Escape Route Detection
- Identify the closest Exit Points
- Generate a Safe Route avoiding Emergency Blockers

Notification API
- Initiate First Responder Notification
- Alert close by devices by Emergency Push Notification

User Visualisation Dashboard
- Live Track Affected Devices
- Detect User Groups on nearby locations

Labels:
- JSON
- Floor Plan
- Network Logs
- Acoustic Signal
- Access Point Mapping
- Network Logs
- Gunshot Detection Signal
- Issue First Responder Notification
- Access Points Tracking Metadata
- User Location
- Escape Route Notification
- User Location Metadata

- Jatin also worked on creating a simulation software that would generate Wi-Fi Access point logs to simulate a real-world User Traffic across a building plan.

```python
21  # Function to generate a random MAC address
22  def generate_mac_address():
23      return ':'.join(['%02x' % random.randint(0, 255) for _ in range(6)])
24
25  # Function to generate a random RSSI value
26  def generate_rssi():
27      return random.randint(-100, -30)
28
29  # Function to generate random data transfer values in bytes
30  def generate_data_transfer_amount():
31      return random.randint(1000, 1000000)
32
33  # Generate a list of fake WiFi access point logs
34  def generate_wifi_access_point_logs(n):
35      logs = []
36      for _ in range(n):
37          log_entry = {
38              'Device Status': random.choice(device_statuses),
39              'Name': fake.name(),
40              'User Name': fake.user_name(),
41              'MAC Address': generate_mac_address(),
42              'IP Address': fake.ipv4(),
43              'OS': random.choice(operating_systems),
44              'Associated Access Point': random.choice(access_points),
45              'Associated SSID': random.choice(ssids),
46              'RSSI (dBm)': generate_rssi(),
47              'Best RSSI (dBm)': generate_rssi(),
48              'Uplink Data': generate_data_transfer_amount(),
49              'Downlink Data': generate_data_transfer_amount(),
50              'Avg. data rate': random.randint(1, 1000),
51              'Connected / Disconnected Since': str(fake.date_time_this_month()),
52              'First Detected At': str(fake.date_time_this_year()),
53              'Location': fake.city(),
54              'Sticky': random.choice([True, False]),
55              'Tag': fake.word(),
56          }
57          logs.append(log_entry)
58      return logs
59
60  # Example: Generate 5 WiFi access point log entries
61  num_logs = 500
62  generated_logs = generate_wifi_access_point_logs(num_logs)
63  logs = []
64  for log in generated_logs:
65      logs.append(log)
66  with open("wifi_access_point_logs.json", "w") as file:
67      json.dump(logs, file, indent=4)
68
```

- Isha Ghiria
    - Isha worked on creating Mockups for the Front-End of the ERA System, Designing the User Input Page for the Floor Plan
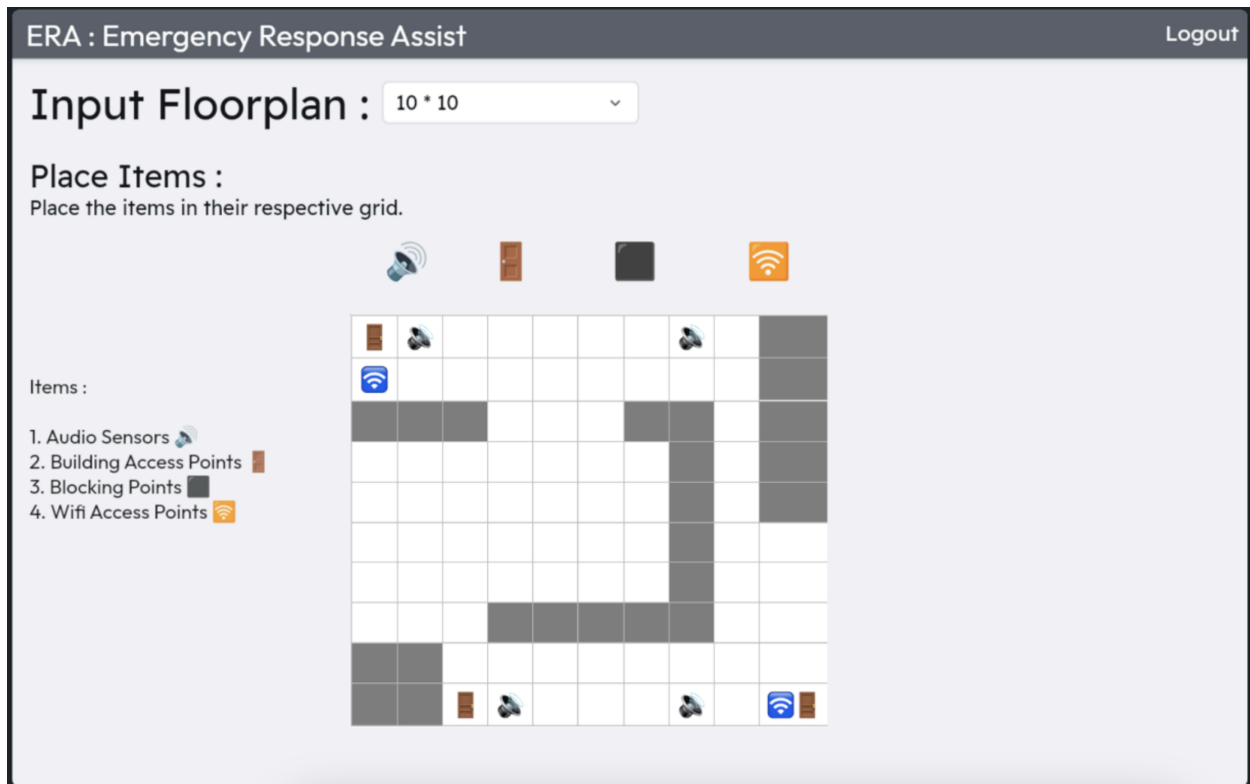
- Vaishnavi Sunil Desai
  - Vaishnavi Worked on Researching the algorithms to plan the escape routes for the users in an emergency, assessing the current floor situation, identifying all blockages and finding the shortest path to the nearest exit point.

- Sharvesh Patki
  - Sharvesh worked on identifying and analyzing the Wi-Fi access point metrics and logs to identify the metrics that will be useful for the User Triangulation Algorithm to be utilized in the ERA system to approximate device locations.

Parameter	Description
Device Status	Indicates if the client is successfully associated or failed to connect.
Name	Specifies the user-defined name of the client.
User Name	The username of the client.
MAC Address	Specifies the unique 48-bit IEEE format address of the client assigned to the network adapter by the manufacturer.
IP Address	IP address of the client.
OS	Name of the operating system on the client.
Associated Access Point	Specifies the AP with which a client is associated. This is the AP through which the client communicates with other clients and devices on the network.
Associated SSID	Specifies the operating SSID of the AP with which the client is associated.
RSSI (dBm)	Displays the observed RSSI (Received Signal Strength Indicator) value for the client.
Best RSSI (dBm)	Displays the best RSSI (Received Signal Strength Indicator) value seen for the client.
Uplink Data	Indicates the amount of data transferred by the client.
Downlink Data	Indicates the amount of data received by the client.
Avg. data rate	The average amount of data transferred.
Connected / Disconnected Since	Date and time since the client was connected or disconnected from Wi-Fi Cloud.
First Detected At	Indicates the time and day when the client was first detected.
Location	Location of the client.
Sticky	Indicates whether the client is a sticky client. A sticky client is a client that remains connected to an AP even though there is an AP with better signal strength nearby.
Tag	Additional info about the client.

LEGEND	Description
	Tunable parameters for log generation
	Device Identifiers
	Location Approximators
	Additional Information

- What went well?
  - The team was able to successfully adopt agile methodology and implement daily sprints and setup a JIRA board to track all the issues and progress on the project.
  - The team successfully finalized the submodules required for the ERA system and created an Architectural Diagram for the same.
  - The team was able to get access and analyze the Wi-Fi Access Point logs to identify all available metrics.
- What didn't go well?
  - Jatin Madan
    - Jatin had some issues identifying the necessary submodules and simplifying the ERA Architecture
  - Vaishnavi Desai

- Vaishnavi struggled with implementing Pytorch ML Algorithms on her personal device, due to a CPU Architecture Difference and Portability not being supported at that moment.
    - Team
        - As some of the team members were working in a different time zone, we had odd timings to match and work together.

- What could/should be improved during the next sprint?
    - Updating our JIRA Board more frequently and updating all the tasks we perform on a daily basis.

Sprint Backlog

ID	Type	Owner	Title	Status	Estimate
1	User Story	Jatin Madan	Create a Simulation Software to generate Network Logs	In progress	4
2	User Story	Jatin Madan	Create an Architectural Diagram for ERA	Completed	4
3	User Story	Isha Ghiria	Create Mockups for Front-end UI	Completed	2
4	User Story	Sharvesh Patki	Research on Wifi Access Point Logs and Metrics	Completed	4
5	User Story	Vaishnavi Desai	Research on Escape Route Detection Algorithms	In progress	4