

# Dynamic Tagging



## Overall Goal

Bridge Dynamic Tagging System assists first responders in marking and monitoring significant locations of the disaster site and in creating real-time situation awareness. It aims to ease the annotation of the field with digital information targeting at an improved spatial reference system and shared mental model for fire fighters. Such an annotated disaster site enriches the process of spatial sense making performed by first responders in the field.

## Main Functionality

The tagging process is as follows:

1. In their exploration process of the incident site, first responders mark specific points in space either
  - a. physically through the deployment of a sensor tag or
  - b. virtually through some type of digital information such as a specific symbol, a voice recording, a text, etc.
2. The Master receives the sensor values or the digital information associated with a GPS position and visualizes them on the map.
3. Other first responder teams in the field use a mobile device with a map view or an augmented reality view to discover the information deposited by the former first responder team in the field.



Figure 1: Tagging the environment using symbolic icons

## The Tagging Device

The Tagging Device forms the main point of access for the dynamic tagging system and serves two purposes: First, the creation and deployment of dynamic tags in the form of digital information, and second, the exploration of already deployed dynamic tags.

## Tagging the Environment

The Tagging Device already offers a range of pre-built icons that the user can possibly exploit as tags. Each icon visually represents one possible situation that the user might like to report back to his team members and the command post through the dynamic tagging system. If the user selects one of these icons, the dynamic tagging system associates the current position to the respective icon and stores it in the database. At the same time this icon appears on the map of the Master. In a second optional step, the user might also want to bind a personal note with the selected and positioned icon. Such a personal note can consist in a voice recording, an image, written text or a drawing.



## Visualizing tags in the Environment

The Tagging Device is also to visualize the dynamic tags placed in the environment. Two different visualization modes are available: The map mode (Figure 2) and the augmented reality mode (Figure 3). In the map mode, icons representing each dynamic tag are displayed on a map. For outdoors, a Google Map is used and the user's position is acquired by GPS. For indoors, the model of the building and roughly estimated positions are used. The augmented reality mode presents the stream of the built-in camera with an overlay of abovementioned icons representing a dynamic tag. The user operates the Tagging Device as a "lens", scanning the environment by turning around and acquiring the digital information associated with a dynamic tag in his current view. Touching on one of the icons with the finger in either visualization mode, the user receives the digital information, either sensor data or human-made information (e.g. voice recording), on the screen or through the loudspeakers of the tagging device.



Figure 2: Using the Tagging Device as a map viewer showing important tagged places



Figure 3: Looking "through" the tagging device using the augmented reality mode

## The Sensor Tags



Figure 4:  
Example Sensor  
Tag

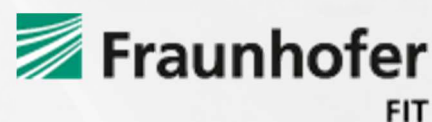
Sensor tags continuously measure environmental parameters such as air temperature, CO<sub>2</sub> contamination, etc. (see Figure 4). First responders can deploy these tags in the environment through clipping them to the relevant location or through throwing them towards a desired direction. Once activated, the tags acquire the exact GPS position and start to send a stream of sensor values to the command post.

## Features Visible in Demo III

The Dynamic Tagging system will demonstrate one aspect of tagging the environment, namely e-triage (i.e. tagging of victims). Since the eTriage system represents a specialization of the Dynamic Tagging system, the map view and an augmented reality view for the exploration of the tagged environment will be demonstrated.

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