Video Annotation Tool

The DemaWare2 Video Annotation tool enables researchers to manually mark image datasets with activity data for benchmarking. The tool implements a web-based player-like environment that can go through images recorded for each participant in lab trials. At the same time, the user can pick a list of activities, their starting and ending points as observing them. When using RGB-D cameras, only RGB is used. Therefore, the tool servers two purposes: a) to allow pilots annotate their data to serve as ground truth for various algorithms b) to enable developers as well as pilots to go through the recordings and observe the experiment afterwards. The final output of activities and timestamps is exported in a universal format (XML) usable beyond the Dem@Care methods and scope.
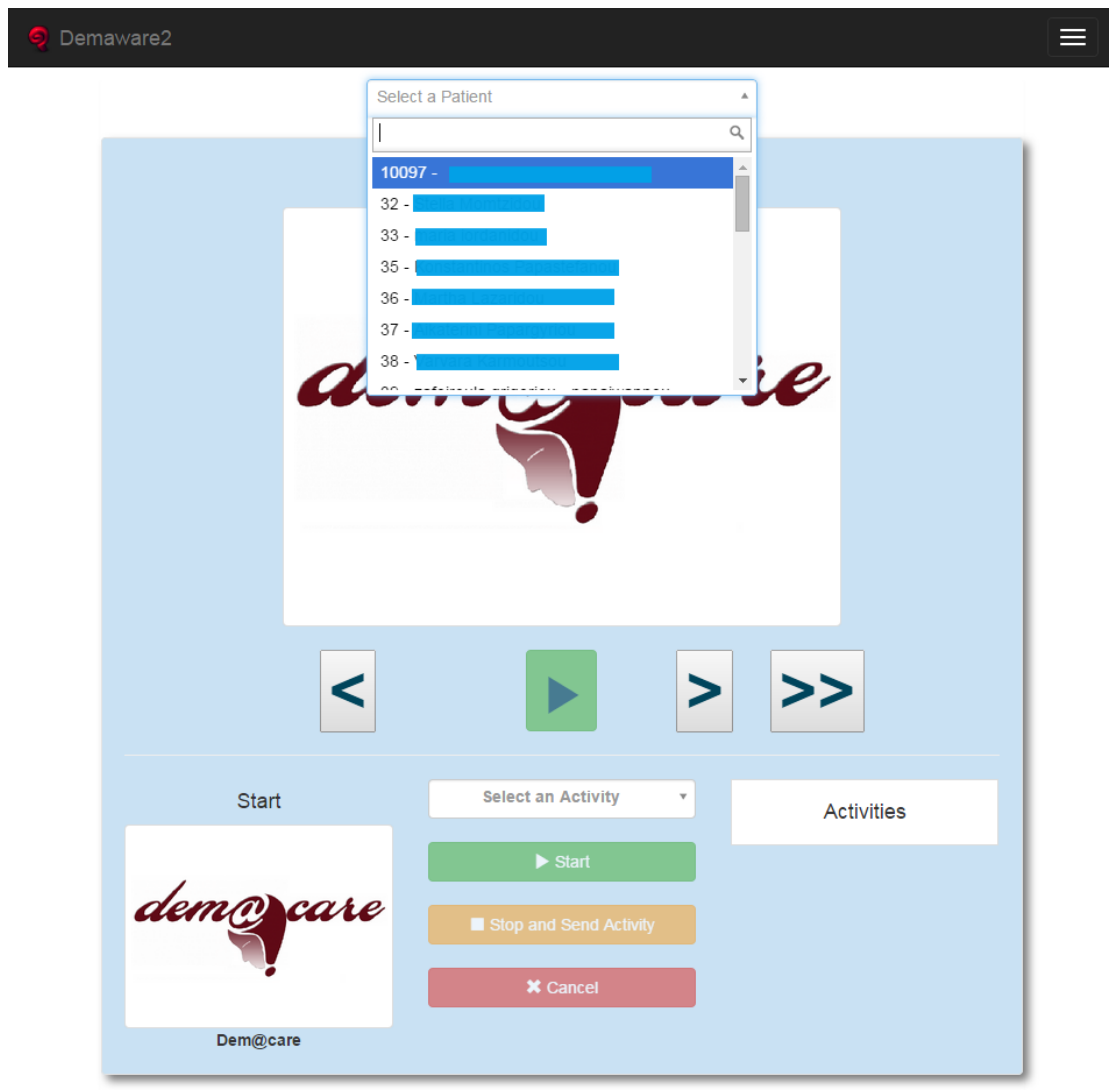

Figure 1. Selecting a patient on the Video Annotation tool

Funcionality

First of all, the user has to select one of the available patients using the dropdown box, assisted by autocomplete. The respective images are loaded in a player-like interface in the center of the page. The user can then navigate the images back and forth using the buttons or even the arrow keys on the keyboard. He can also view the images as a video by pressing

the "play" button. The right-most "fast-forward" button moves 100 frames forward to speed up the process.

For the actual annotation, the users has to navigate using one of the above described methods, to the image that mostly resembles to the beginning of an activity. Then, he has to select the annotation label for the activity from the dropdown box e.g. "EstablishAccountBalance" or "PrepareHotTea". The activity start is assigned by pressing the "Start" button and the image is displayed at the left, for reference. The user is then free to navigate to the image that best corresponds to the end of the activity and press "Stop and Send Activity" to commit the activity annotation in the file. Alternatively, he can press "Cancel" to abort the process before committing the activity. Meanwhile, existing annotations are always displayed at the right panel.

As an example, the user has pressed Start on a previous image for PrepareHotTea on Figure 2. Figure 3 shows the end result, after pressing Stop, where the annotation is committed.

Figure 2. Annotation of PrepareHotTea: the starting point of the activity has been assigned (seen on the left). The user can look for the ending point or cancel the annotation. Existing annotations are seen on the right.
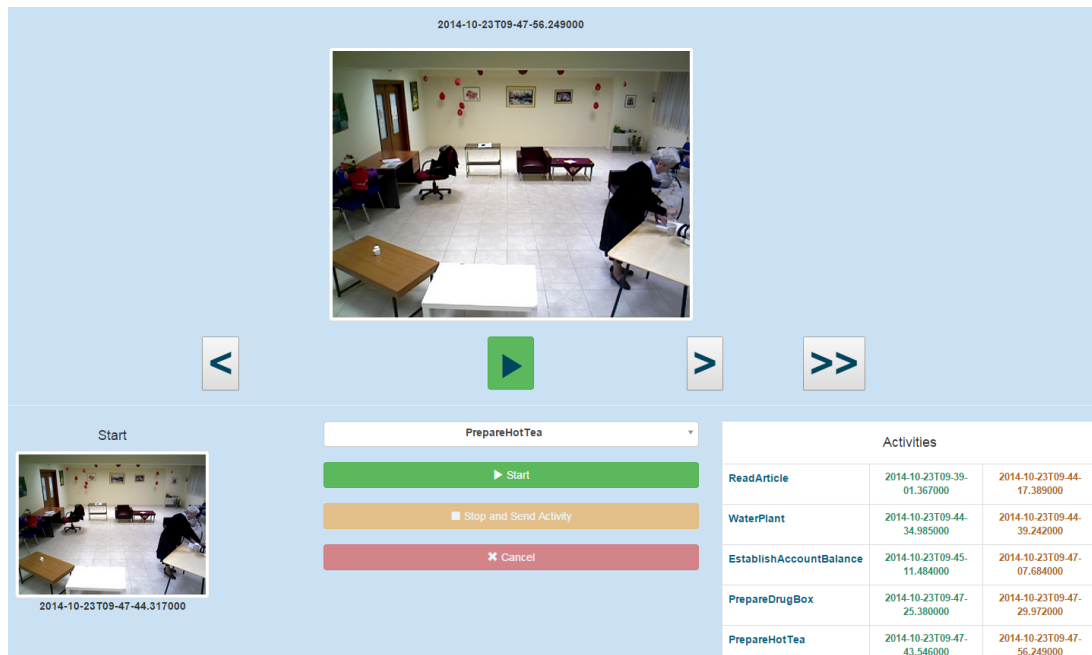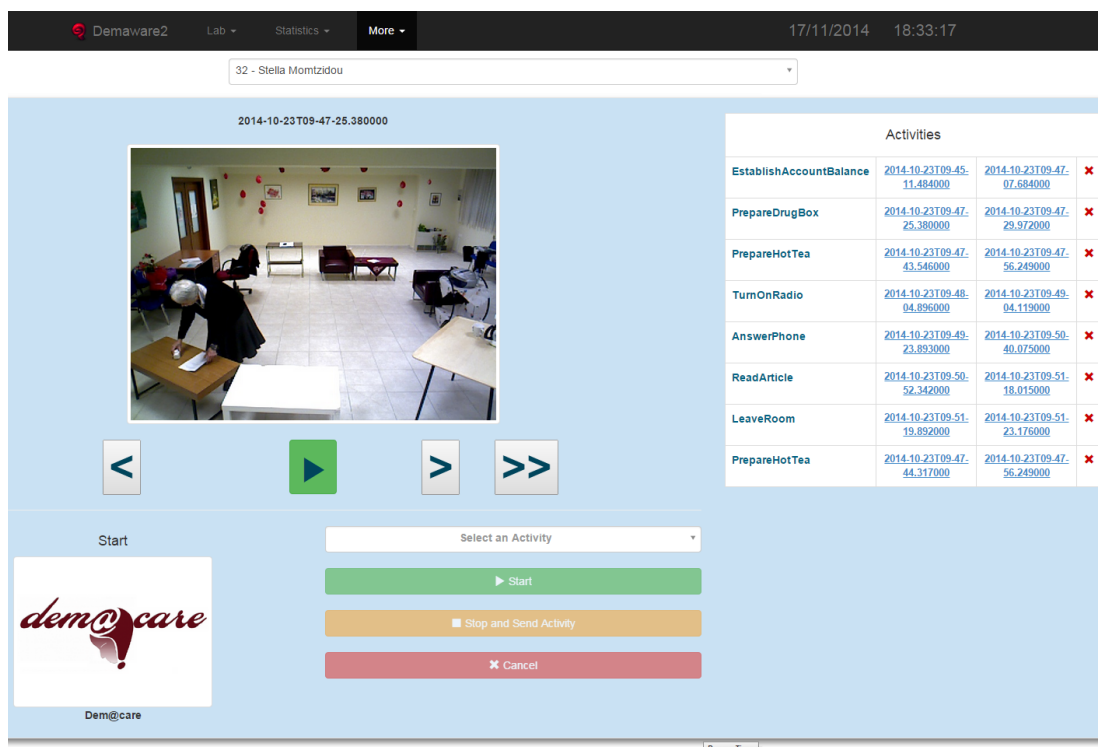
Figure 3. Annotation of PrepareHotTea is completed, the annotated activity has been entered on the right, and the user can start a new annotation.

An existing annotation can be removed by clicking the "X" sign next to it.

The user can also navigate to the start and end times of annotated activities by clicking them.

Implementation

Regarding implementation, the GUI application loads queries both the database and the file structure to obtain a list of patients. Then the stored images, as recorded during the experiment by the CAR software from the Asus Camera, are loaded. Consequently the user

can select annotations and mark the beginning and end of an activity on respective images. On the backend of the application, this information is written in xml files, suitable to be read by any algorithm for the assessment of its precision e.g. HAR or SI.

Installation and Configuration

The Video Annotation page is part of the demaware2 GUI but can be used without the rest of the system. To do so it requires to only copy the following:

- *demaware2* folder in an Apache server (e.g. www in wamp, htdocs in xamp)
- *BackendServlet2.war* in tomcat webapps (on the same host)

Note that the components were renamed so as not to conflict with the CS system. Both can coexist.

Some parameters that can be configured are

parameter	default	location
Servlet URL	*$host$:8282/BackendServlet2/*	*\js\annotation.js
Video Location	*C:\DEM@CARE\Patients**	config/config.php

* demaware2\more\videoAnnotation

** files from then on must be stored at PatientID\HAR\, in .jpg format as saved by Asus/CAR.

Note that the application will load and display data grouped in patient IDs as found in the above set video location. Optionally, with the demaware database it can also display patient names.

To load the GUI go to:

$host$/demaware2/more/videoAnnotation