Tracking CTI Extensions

Use cases for suggested extensions of the Tracking CTI.

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Date	Version	Author	Changes
Apr-14-2003	0.1	UB	Initial Release.
Apr-15-2003	0.2	MP	Review.
Apr-15-2003	0.3	UB	TRCTI002:pass-through option, document cleanup.
Apr-16-2003	0.4	MP	Further cleanup.

1 Introduction

This document describes a number of use cases to support the design of TrackingCTI extensions.

1.1 References

//EPLDepot/main/EPL/CTI/doc/UseCase-Description.doc
Guidelines on how to describe use cases

//EPLDepot/main/EPL/CTI/doc/Tracking.doc
Description of the current TrackingCTI

2 Use Cases

2.1 Video Capture Related

Eyematic has received feedback that the current implementation of capturing image is awkward to use in cases where the client application needs more image data than returned from the tracker, e.g. color. Therefore, this section describes methods how image capture is suggested to work in a future extended version of the tracker CTI.

The shown use-cases do not include the most straight-forward scenario where a client simply streams images at arbitrary times into the CTI, i.e. whenever one is available. The reason is that the tracker needs very fine control over framerate and buffering of images. Therefore user-controlled framerate is not an option.

2.1.1 Track object in video acquired through CTI internal method

Reference No.: TRCTI001

Required by:

- Avatar Chat
- FaceStation
- Game Control

2.1.1.1 Description

The objective is to determine the positions of the object features and additional object properties in (almost) every frame of a continuous video sequence. The video frames are acquired by an internal method of the Tracking CTI. This is the current implementation.

2.1.1.2 Actors

The system:
Tracking CTI (Server)

Primary actor:
Client Application

Secondary actor(s):

1. OS (including drivers for camera/framegrabber)

2.1.1.3 Assumptions

Pre-conditions:

1. The size and format of the video frames obtained by the Application are not important.

Post-conditions:

N/A

2.1.1.4 Flow of Events

1. Application requests CTI to enumerate available video capture devices. CTI queries OS to accomplish this.
2. Application uses CTI to choose a specific video capture device. CTI requests OS to connect to driver for this specific device.
3. Application requests CTI to start tracking. CTI requests OS to start video capture for the selected device.
4. Tracking: CTI acquires video frames directly through the OS/drivers without intervention by the Application. Frames are processed and results handed to the Application. The video format of the frames made available to the Application is determined by CTI as appropriate for it's own processing needs.
5. Application requests CTI to stop tracking. CTI requests OS to stop video capture for the selected device.
6. Application requests CTI to de-initialize. CTI requests OS to disconnect from video capture driver.

2.1.1.5 Non-functional requirements

1. Camera/framegrabber combination or digital camera must be supported through "Video for Windows" or "DirectShow".
2. Camera/framegrabber combination or digital camera must support video frame size, format and frame rate required by tracking algorithm: 640x480 interlaced or 320x240 or similar, YUV or grayscale format, at least 30 fps.

2.1.1.6 Issues

N/A

2.1.2 Track object in video acquired through a user-provided implementation

Reference No.: TRCTI002

Required by:

- MIT project
- Shiseido project

2.1.2.1 Description

The objective is to determine the positions of the object features and additional object properties in (almost) every frame of a continuous video sequence supplied by an implementation provided by the client.

2.1.2.2 Actors

The system:
Tracking CTI (Server)

Primary actor:
Client Application

Secondary actor(s):
N/A

2.1.2.3 Assumptions

Pre-conditions:

1. User has provided an implementation of the video capture conforming to a specification given by the Tracking CTI. This specification includes interfaces to start and stop capture as well as set the format/size of the frames delivered to CTI. (This does not mean that capture has to be performed using this format, only that frames delivered to CTI have to be in this format.)

Post-conditions:
N/A

2.1.2.4 Flow of Events

1. Application requests CTI to add the user-provided video capture device by pointing it to the proper interface.
2. Application uses CTI to choose the user-provided video capture device. (CTI will later perform certain functions on the interface of the user-provided video capture device.)
3. Application requests CTI to start tracking. CTI request user-provided video capture device to start video capture.
4. Tracking: CTI acquires video frames directly through the interface of the user-provided video capture device without intervention by the Application. For each frame, additional data can be passed through from the video capture device to the Application. Frames are processed and results handed to the Application. The video format of the frames made available to the Application through CTI is determined by CTI as appropriate for it's own processing needs.
5. Application requests CTI to stop tracking. CTI requests user-provided video capture device to stop video capture.
6. Application requests CTI to de-initialize. CTI releases all references to user-provided video capture device.

2.1.2.5 Non-functional requirements

N/A

2.1.2.6 Issues

N/A