Human Action Recognition Under View Change

Under the Guidance of
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Project Abstract

- An automotive visual surveillance system is used to detect abnormal behavior patterns and recognize the normal ones.

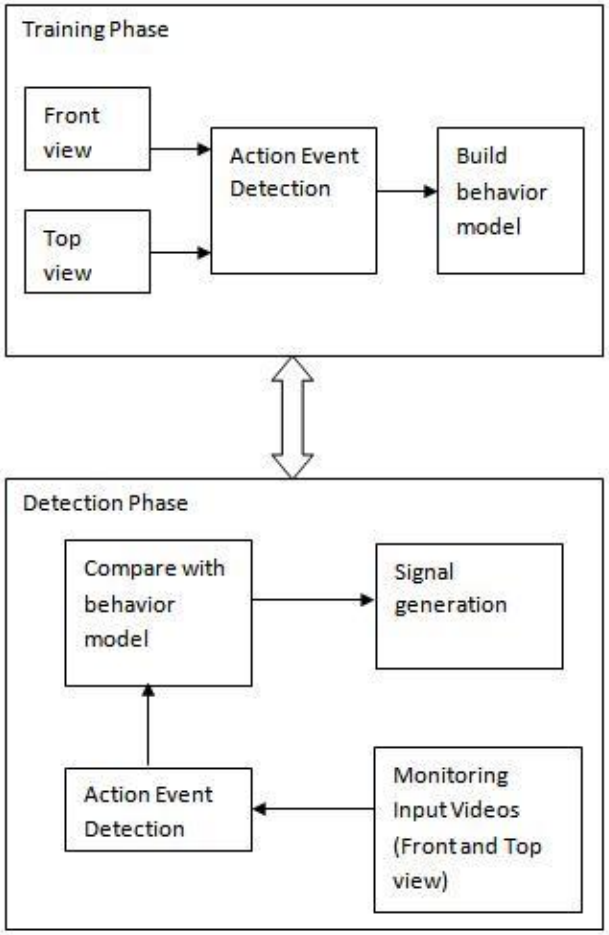
- video of a person is captured via JMF (both front view and the top view) then it is given to the training module.

- Video is checked if it is a normal behavior splited image is taken, whenever the action is recognized blob images are saved, and the frame counts are taken .

- When anomaly is detected, alert system is generated.

- The abnormal behavior is detected by keep tracking the videos and blob frames and checking each frame values.

Introduction to Training and Detection Phase



System Overview

Overview of various Frameworks of our system :

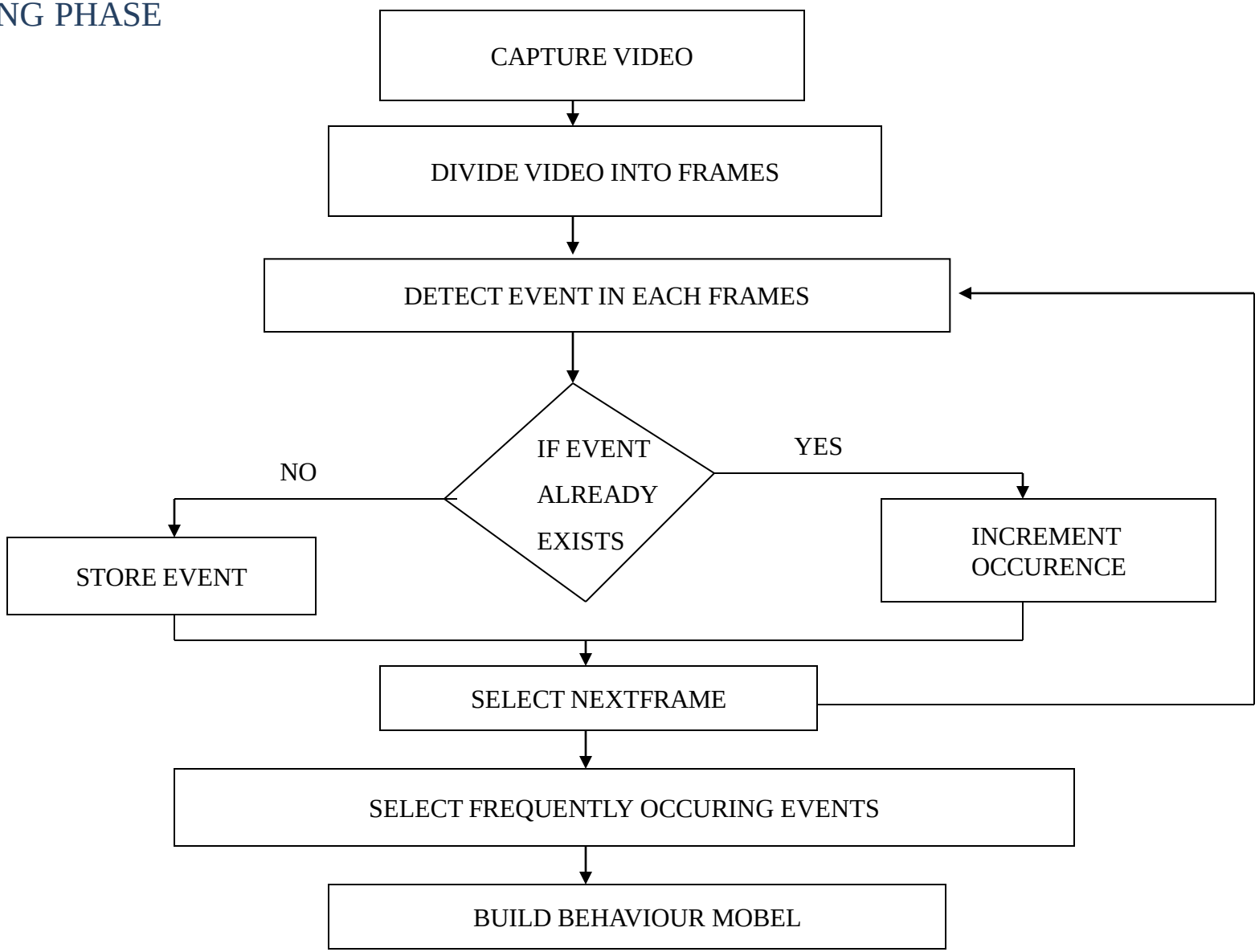
- A scene event-based behavior representation.
- Behavior profiling and pattern matching done to ensure security.
- Quicker Anomaly detection.
- Dynamic in nature and adaptable to the given environment.
- Two Phase work implementation namely Training and Detection Phase

Advantages :

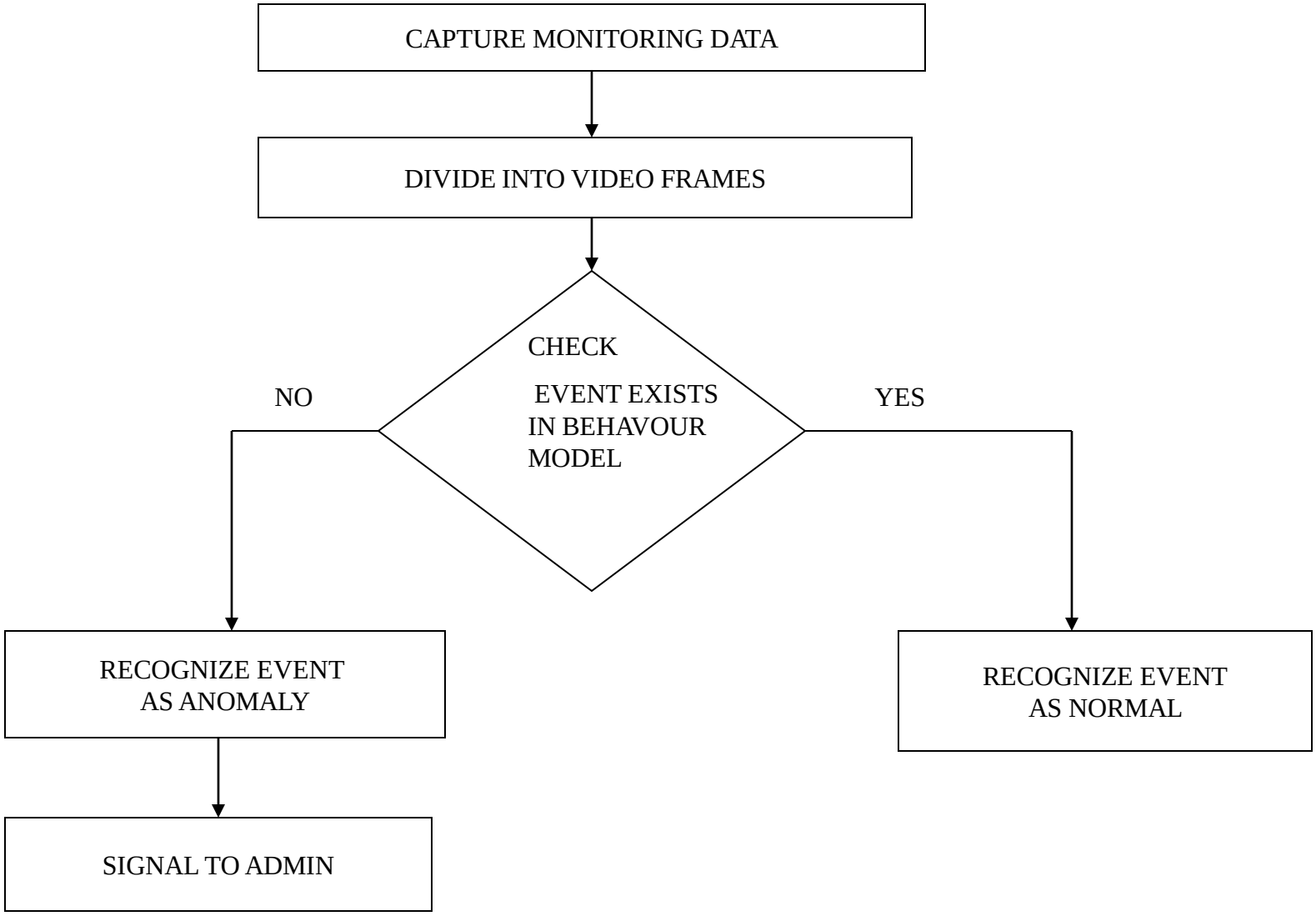
- It is more robust and thus able to work effectively even with sparse and noisy data.
- It is superior in detecting anomaly from an unseen video.
- Each blob with an average PCH value greater than a threshold is defined as a scene event.
- No Database connectivity/usage which significantly reduces working time.

VIDEO BEHAVIOR PROFILING FOR ANOMALY DETECTION

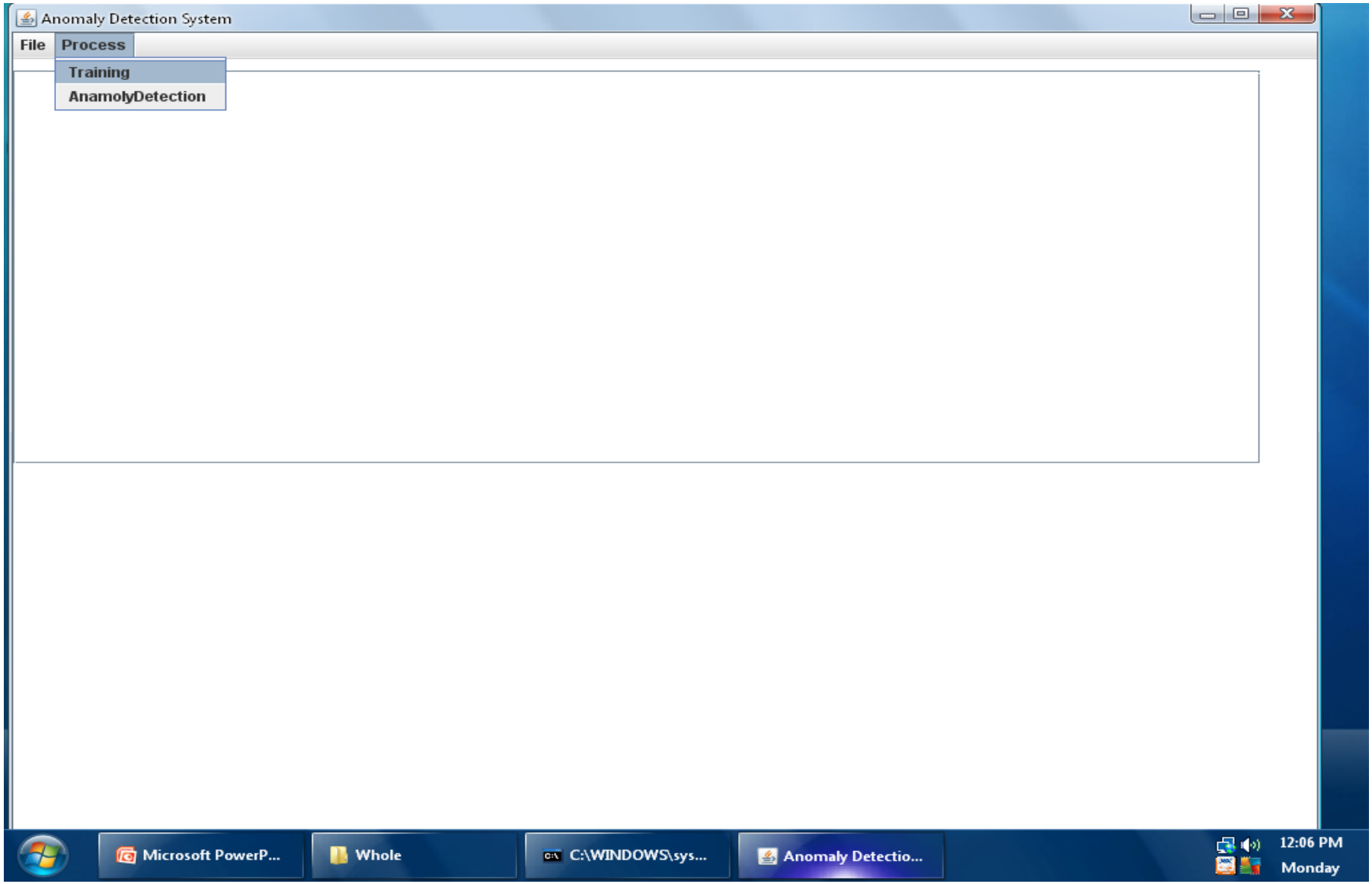
TRAINING PHASE



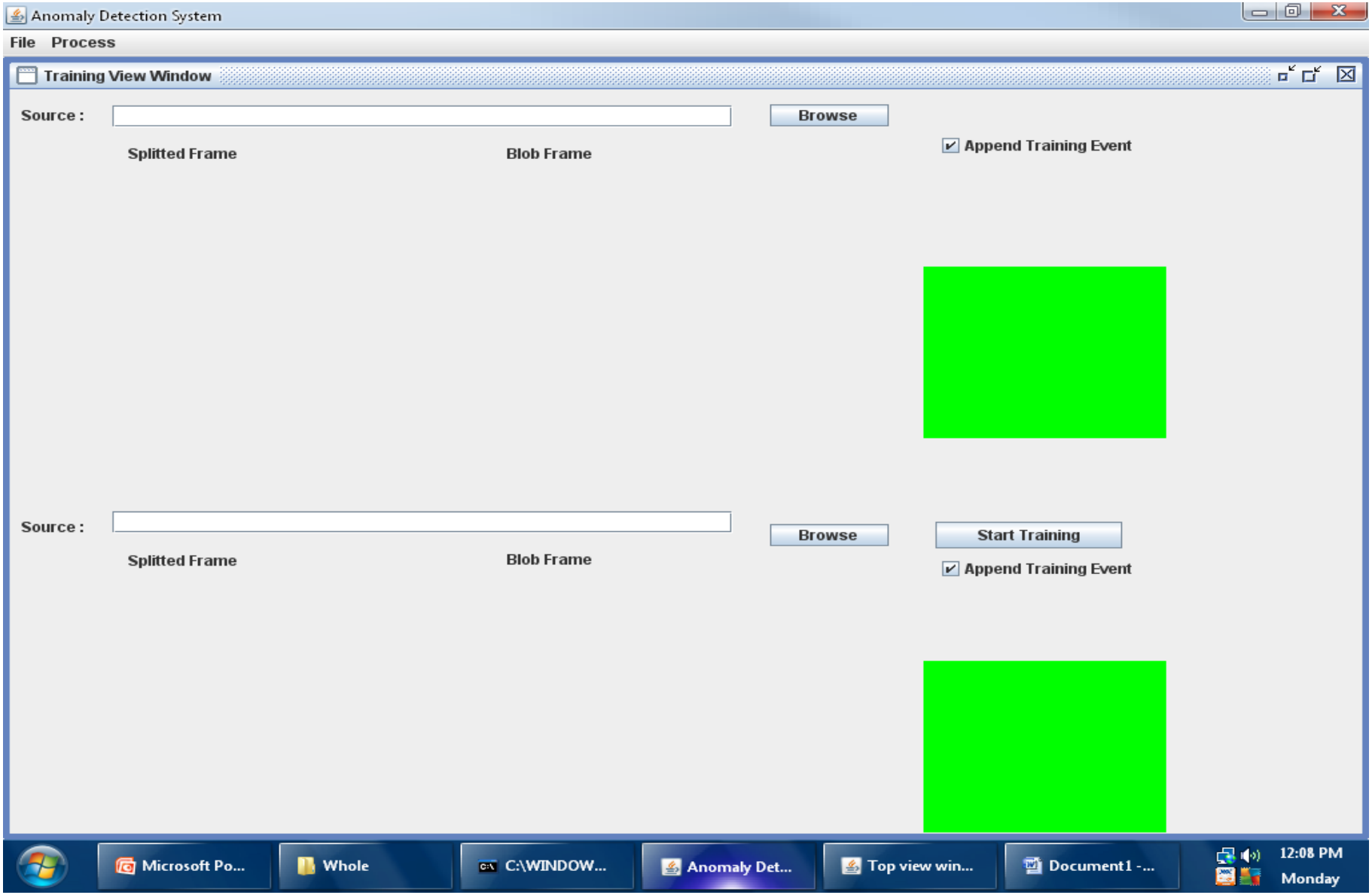
DETECTION PHASE :



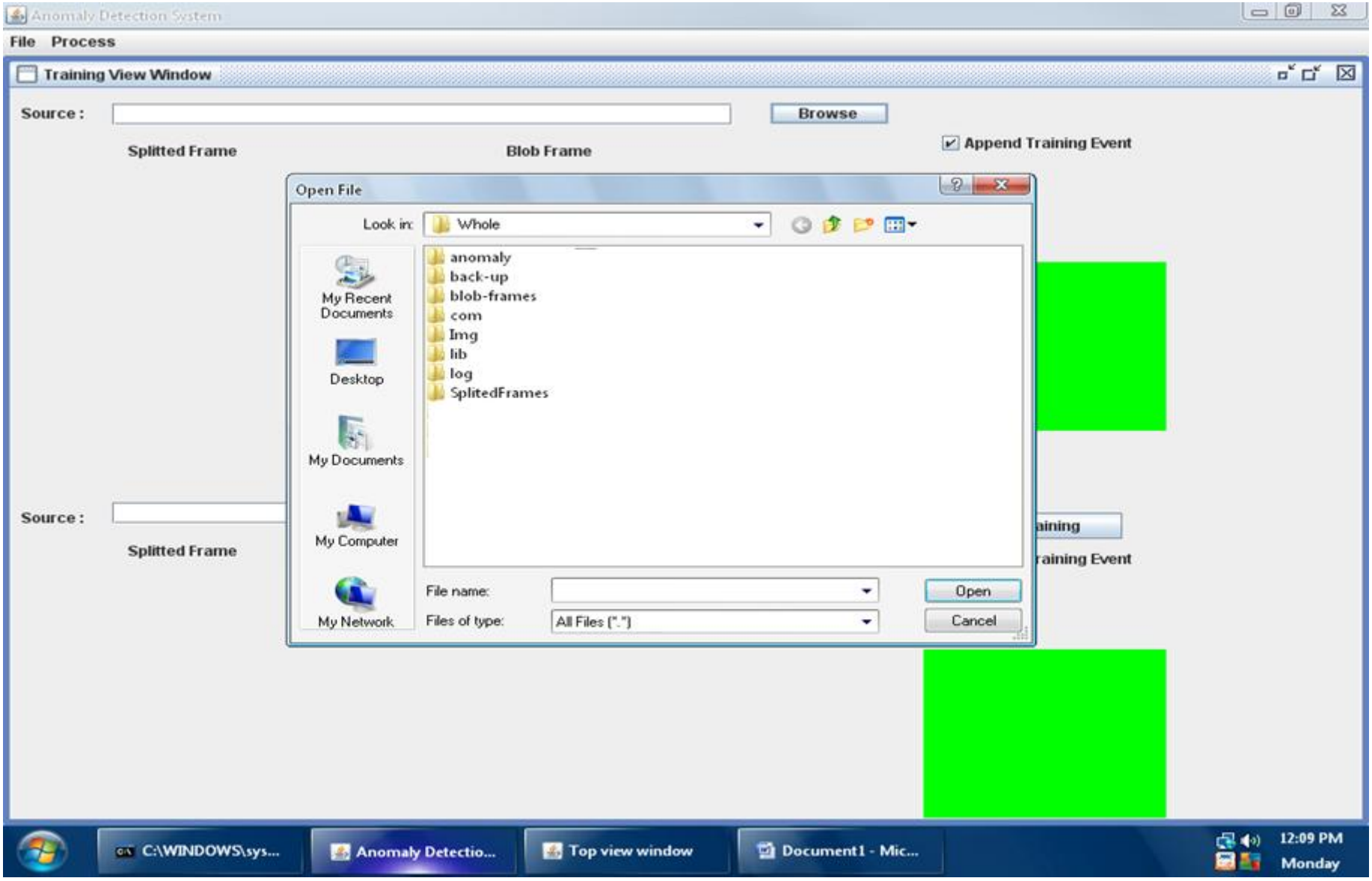
Project Snapshots : Introduction



Training View Window

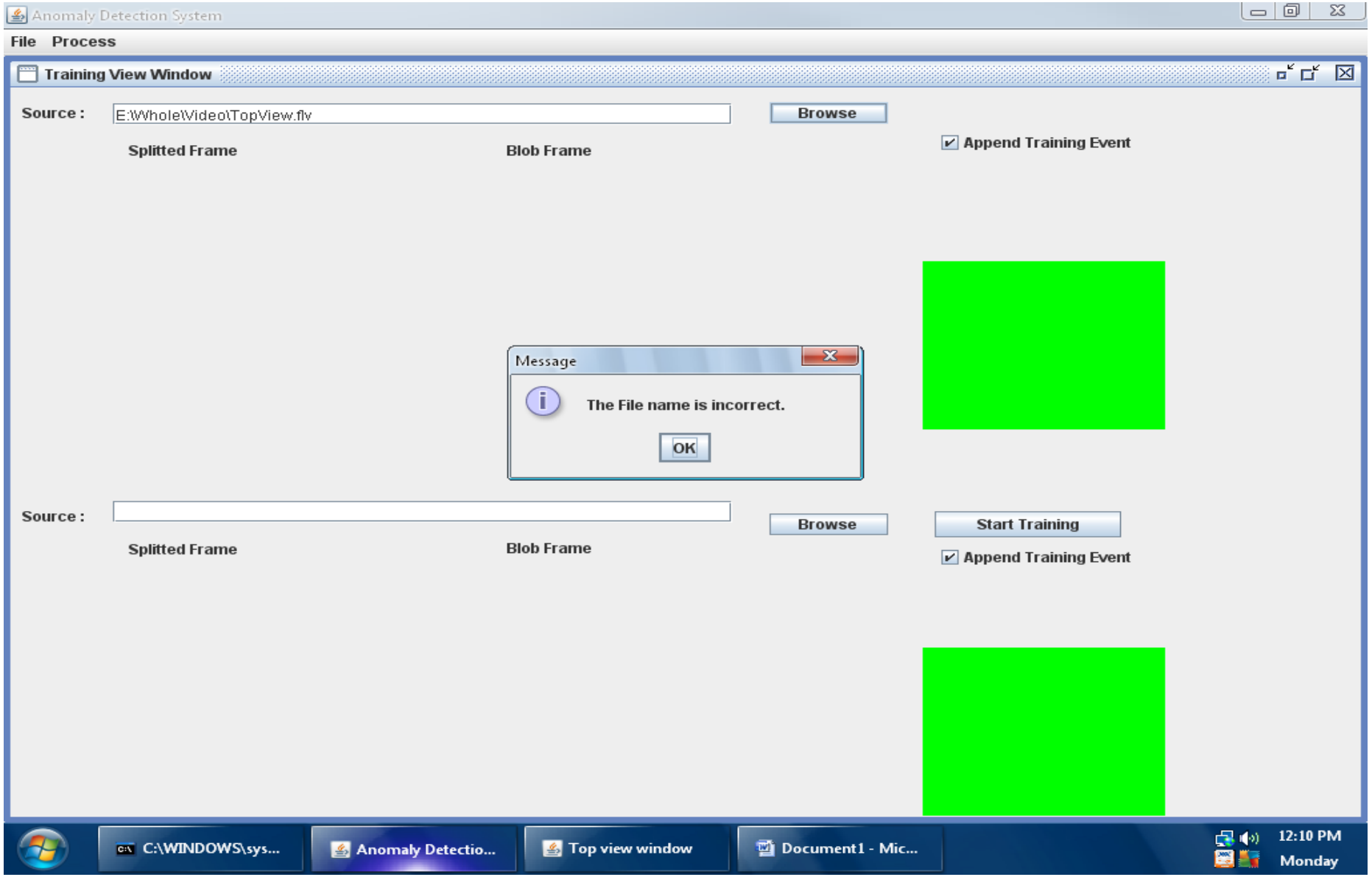


Open Video File

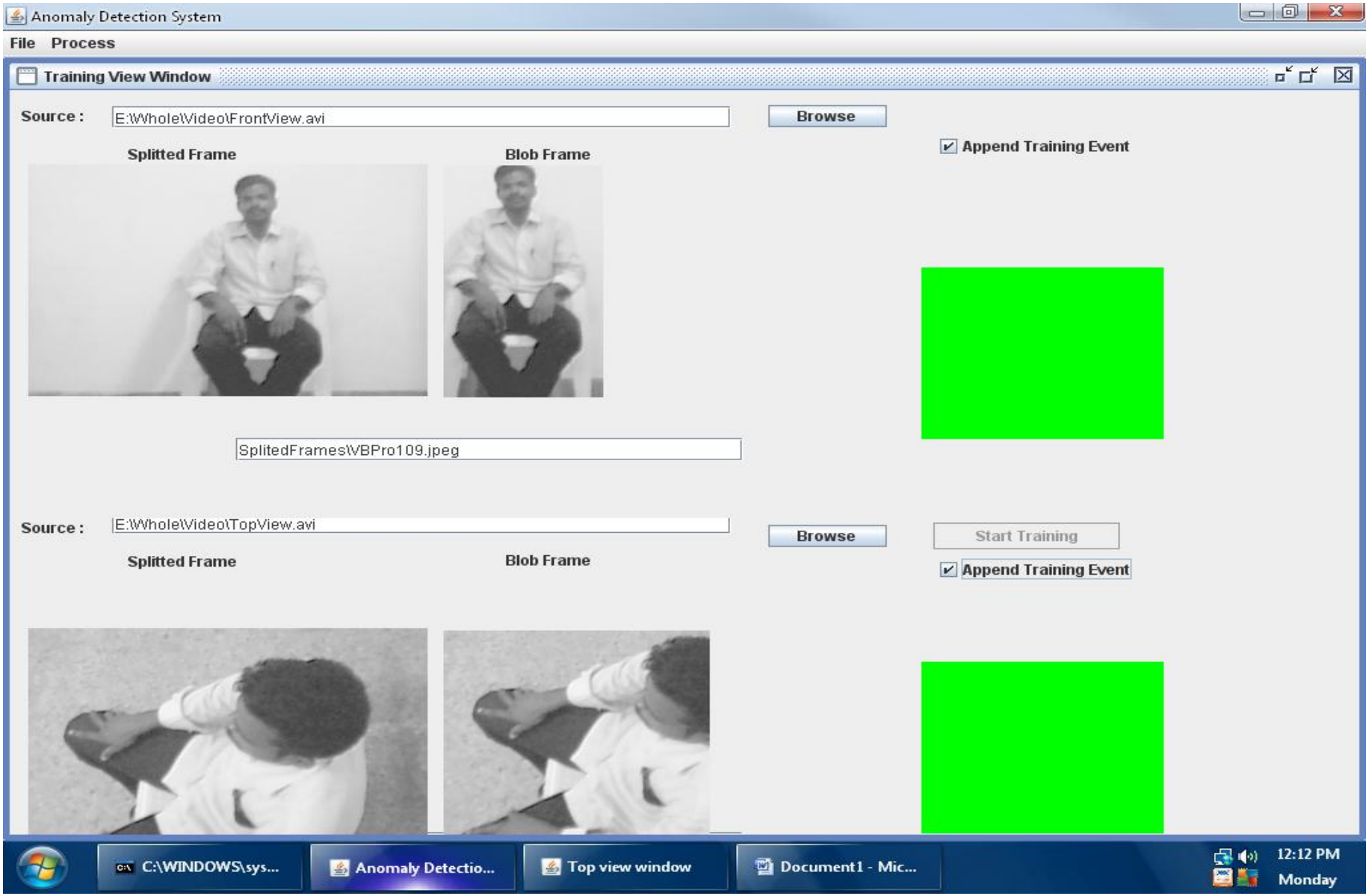


Validations

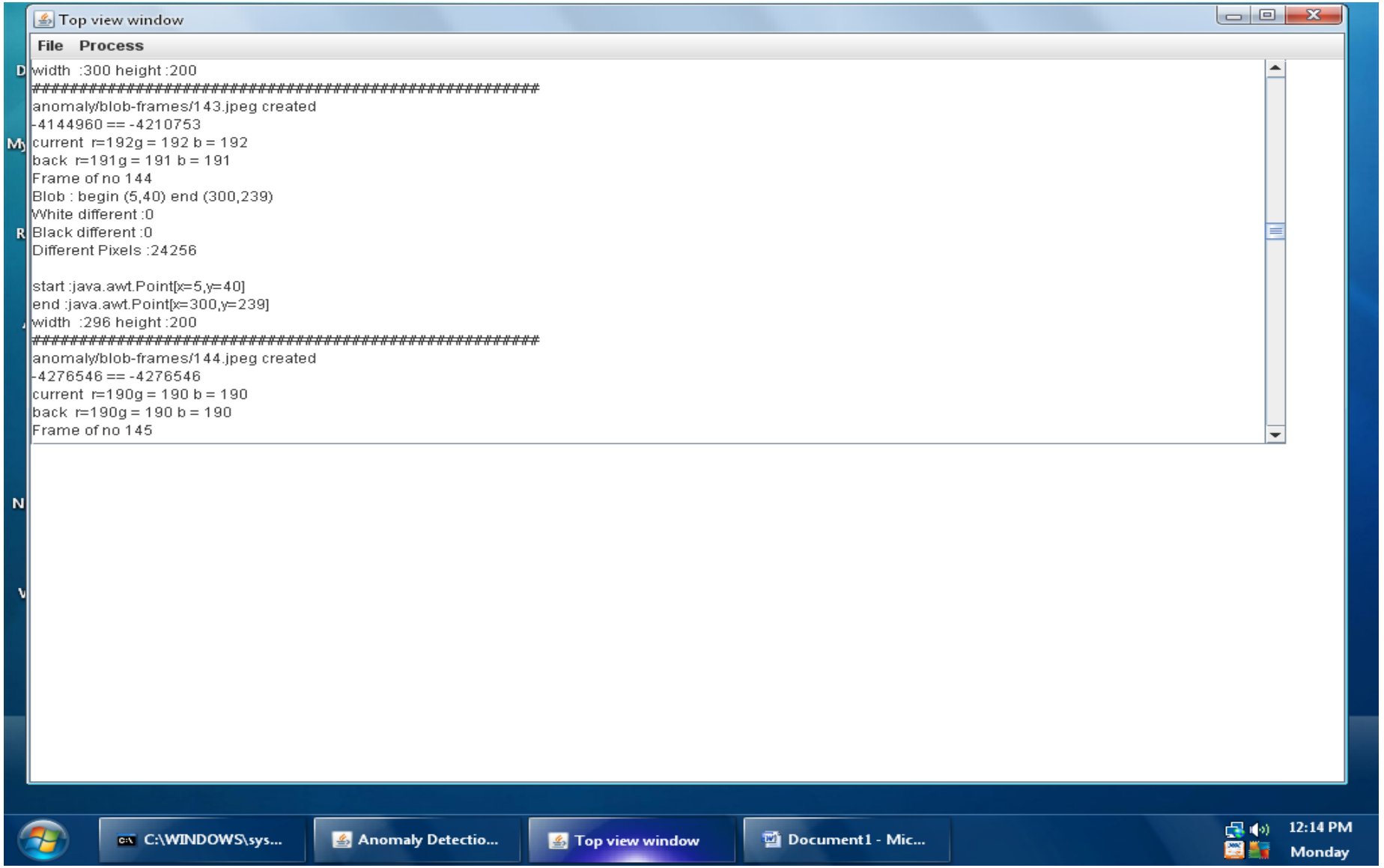
To avoid run-time exceptions validations are preformed and only .avi file format is supported



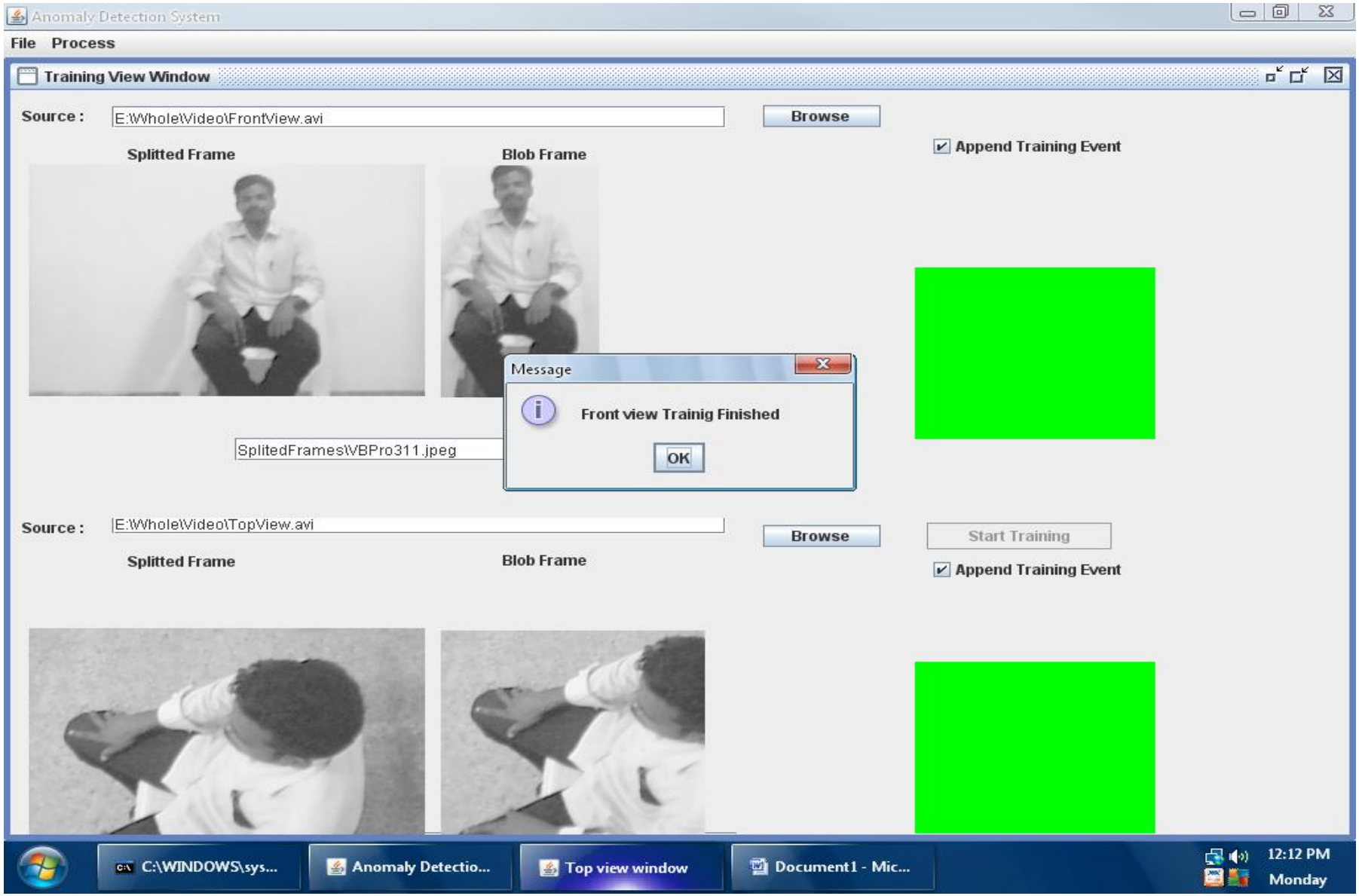
Implementation of Behavior Training



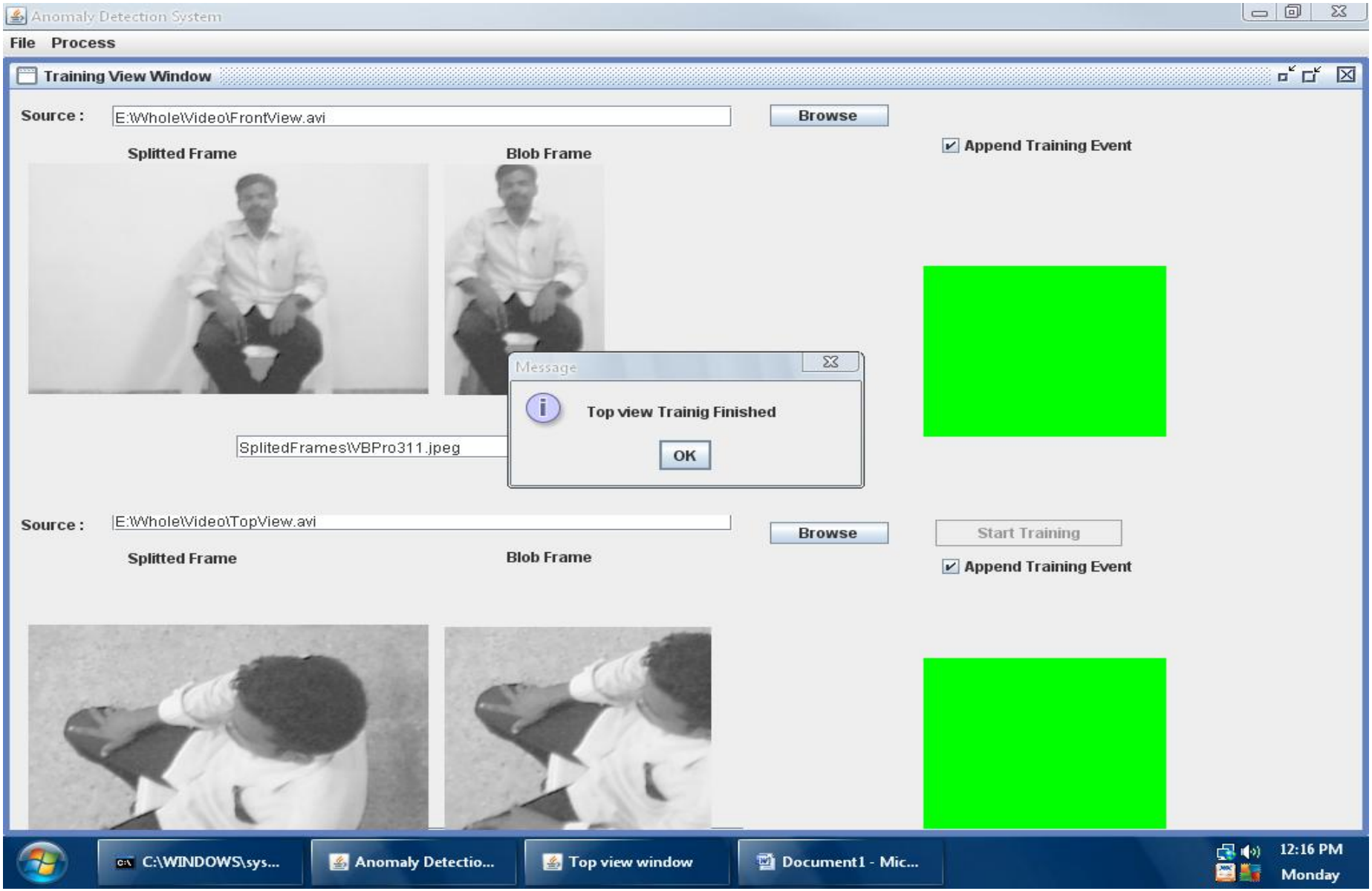
Data Extracted from Training Phase



Completion of Front view Training



Completion of Top view Training



Work completed at End of Training Phase

VIDEO SEGMENTATION

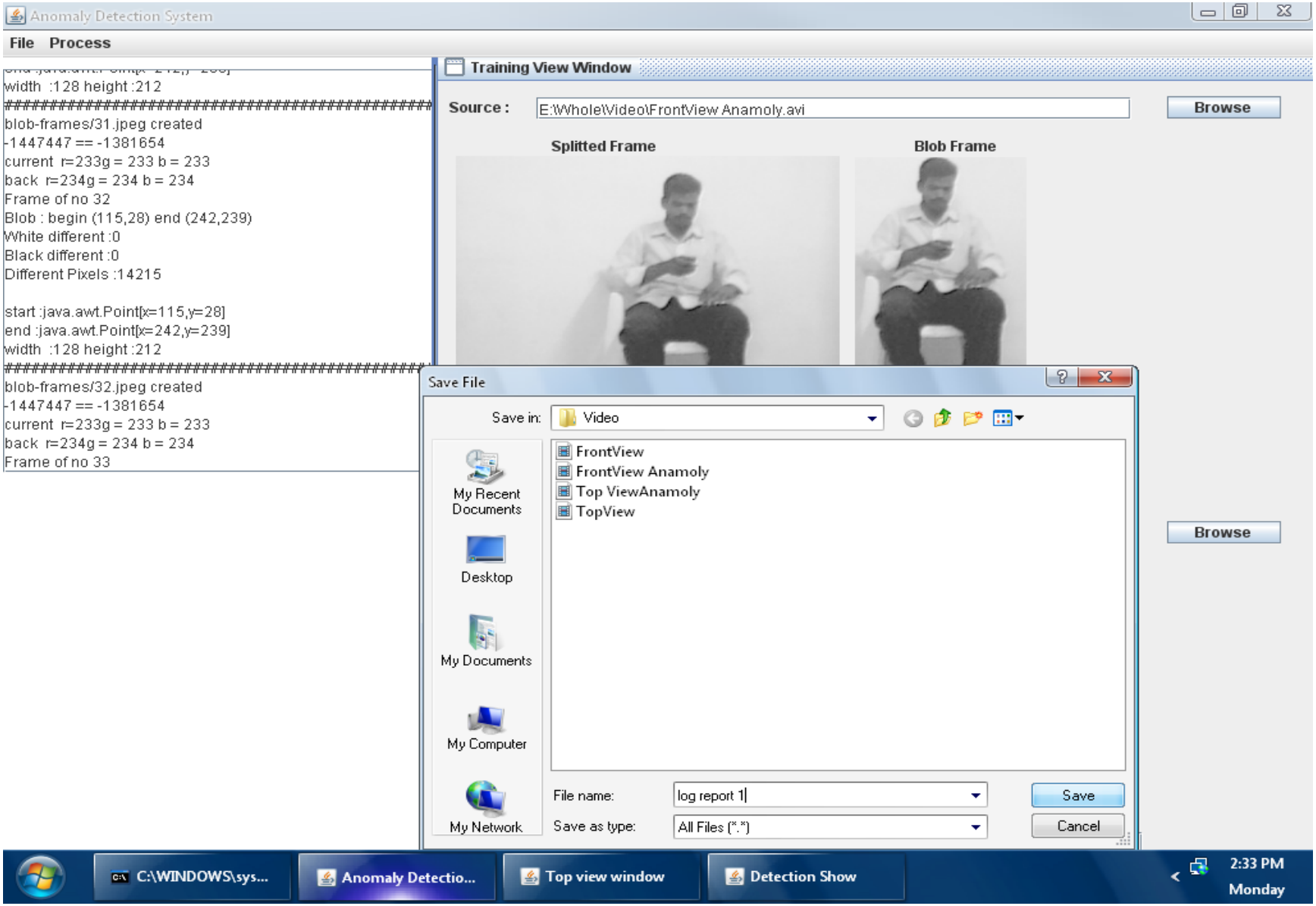
- Video Segmentation involves spitting the input video from the surveillance camera into various sequence of frames with help of Java Media Framework.
- Video can be simply sliced into overlapping segments with a fixed time duration.

EVENT BASED BEHAVIOR REPRESENTATION

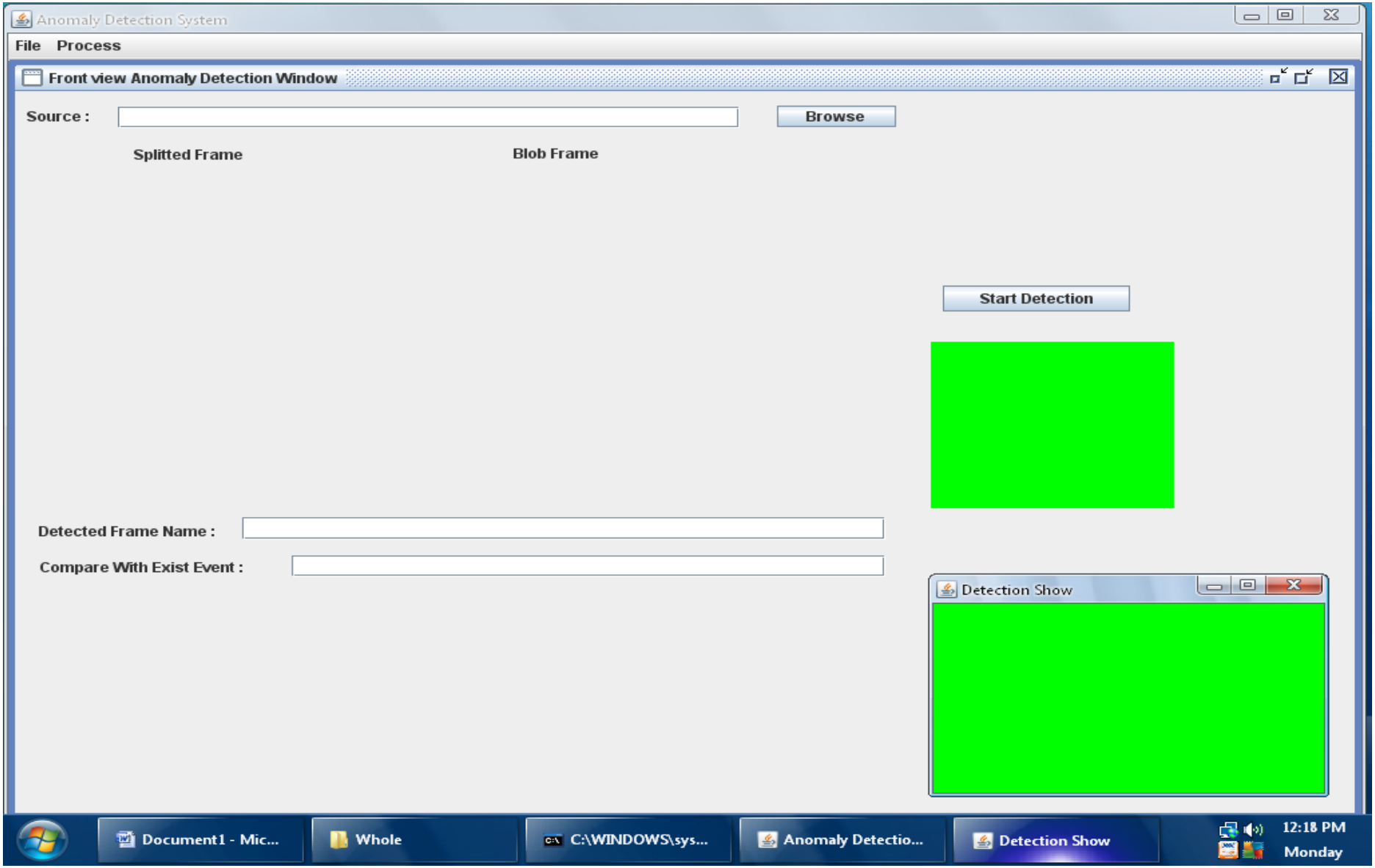
- Extraction of BLOB image from the independent spitted frame of the video an identify the foreground and background pixel of a frame and
- Background model stores the values of a particular pixel which corresponds to background colors.
- Pixel change history(PCH) is represented for a pixel.
- Similar foreground pixels are grouped to form a blob.
- A behavior pattern is represented as a sequence of various events.

Generation of Data Report

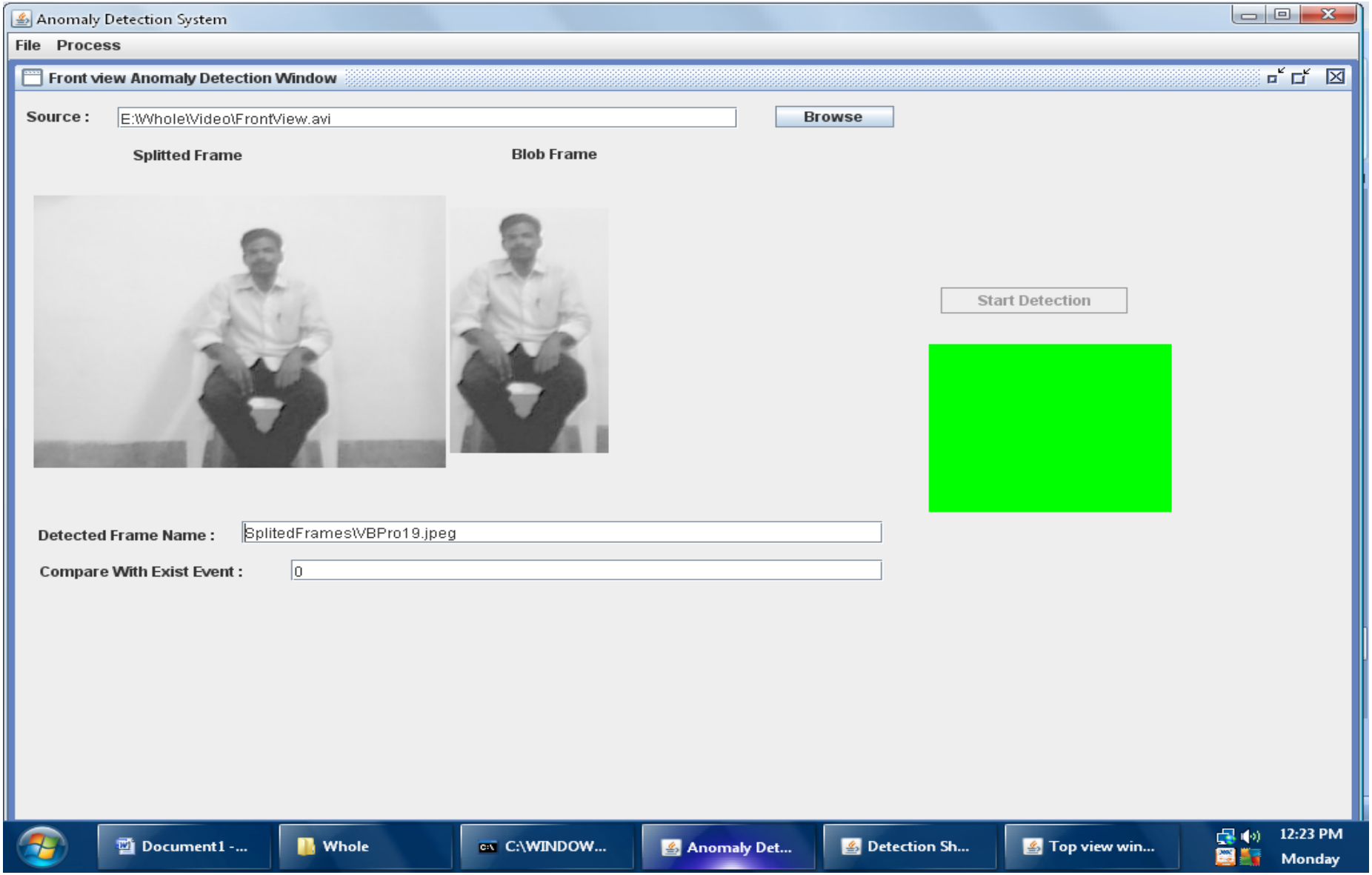
All the data extracted from the BLOB image can be saved to a txt file that can be used as a Data Report for further analysis in future.



Anomaly Detection System

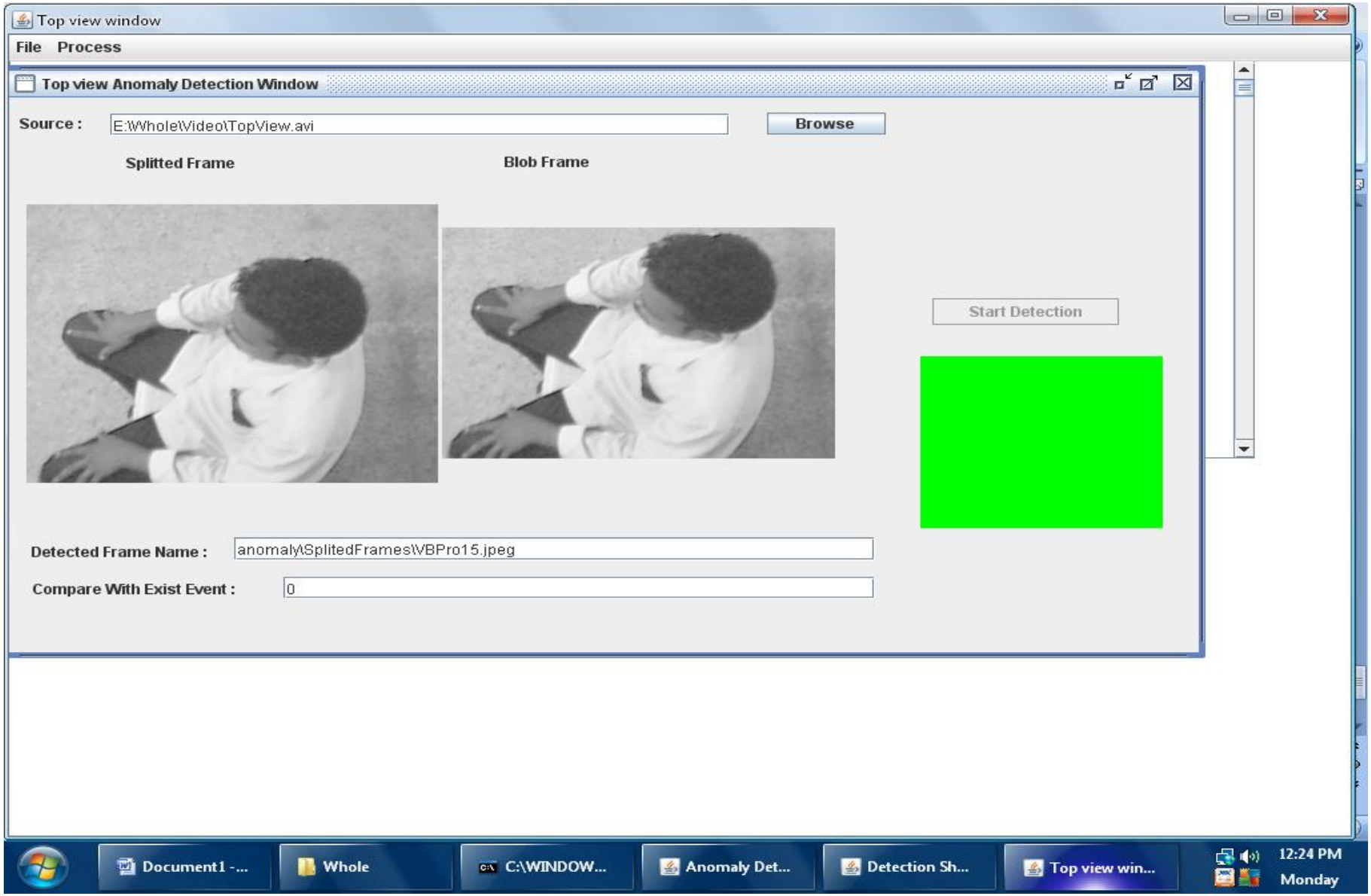


Anomaly Detection – Front View



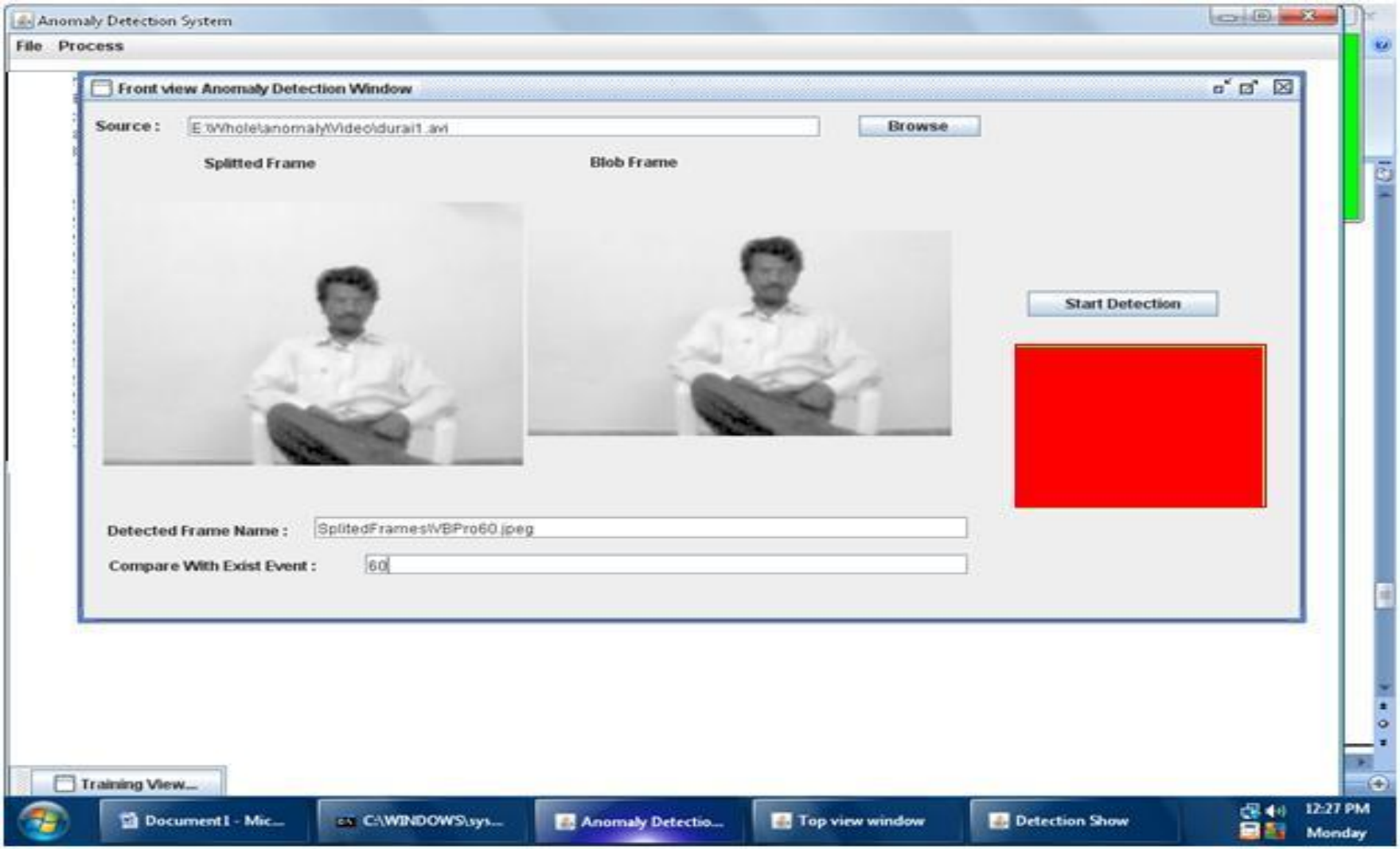
Green Light displayed for an already trained Front View video when the current video is compared with the stored video in system and corresponding Frame Number detected

Anomaly Detection – Top View



Green Light displayed for an already trained Top View video when the current video is compared with the stored video in system and corresponding Frame Number detected

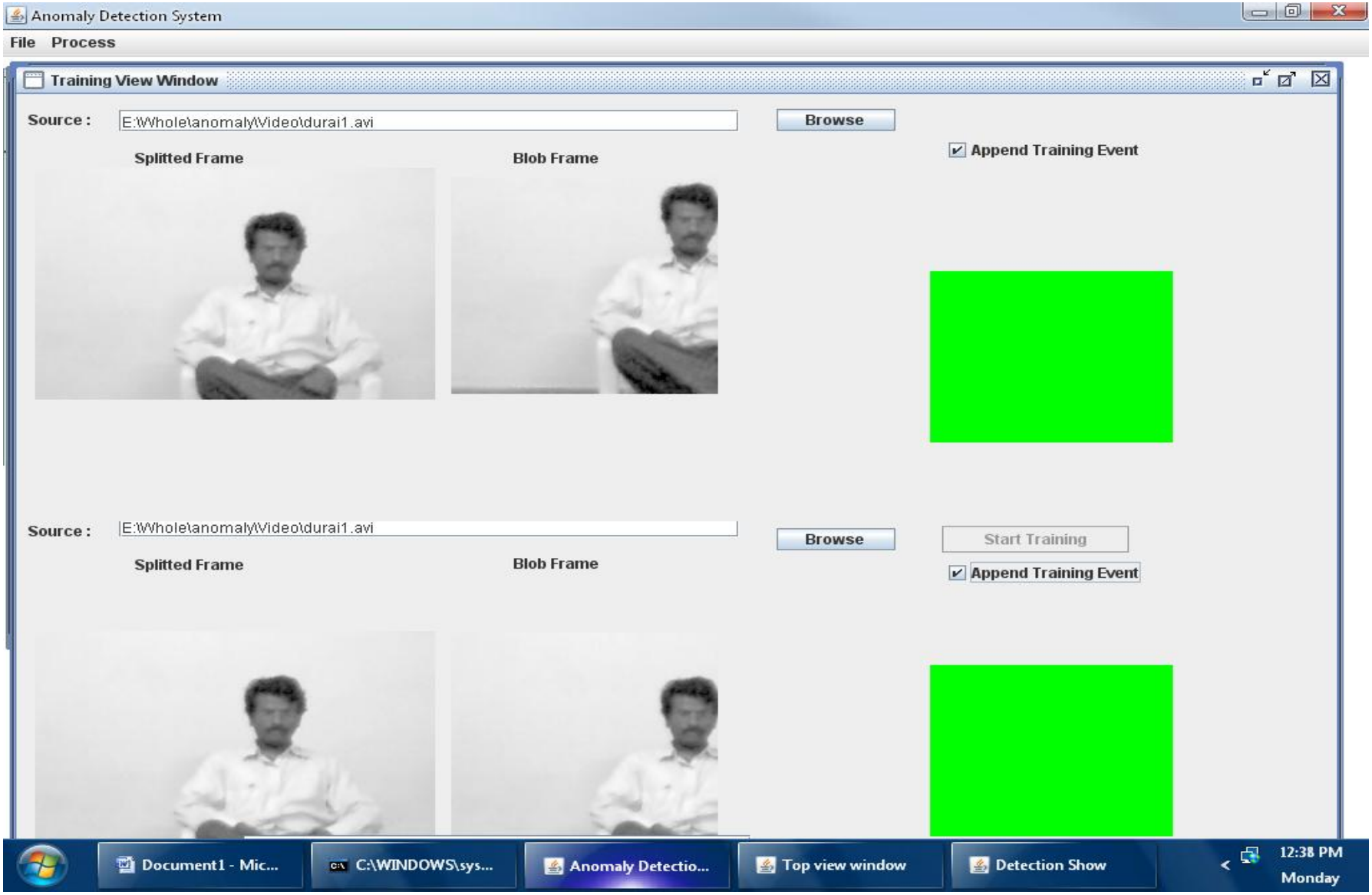
Anomaly Detection



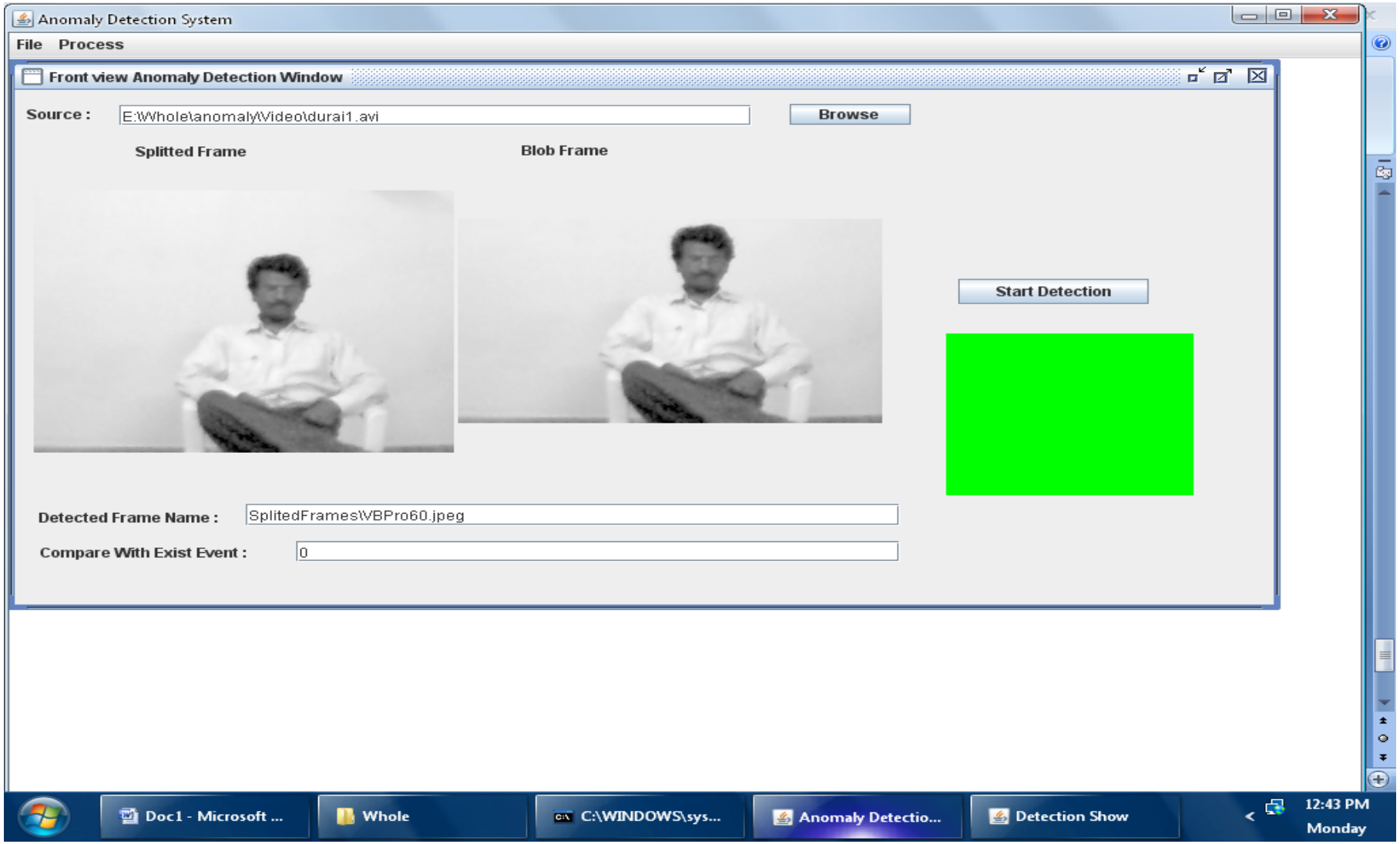
- When a new video is detected for anomaly, a mismatch occurs during comparison as there is no previously stored behavior pattern and Red Displayed.
- Immediately anomaly is informed to the admin who will do the next required action.

Training New Video

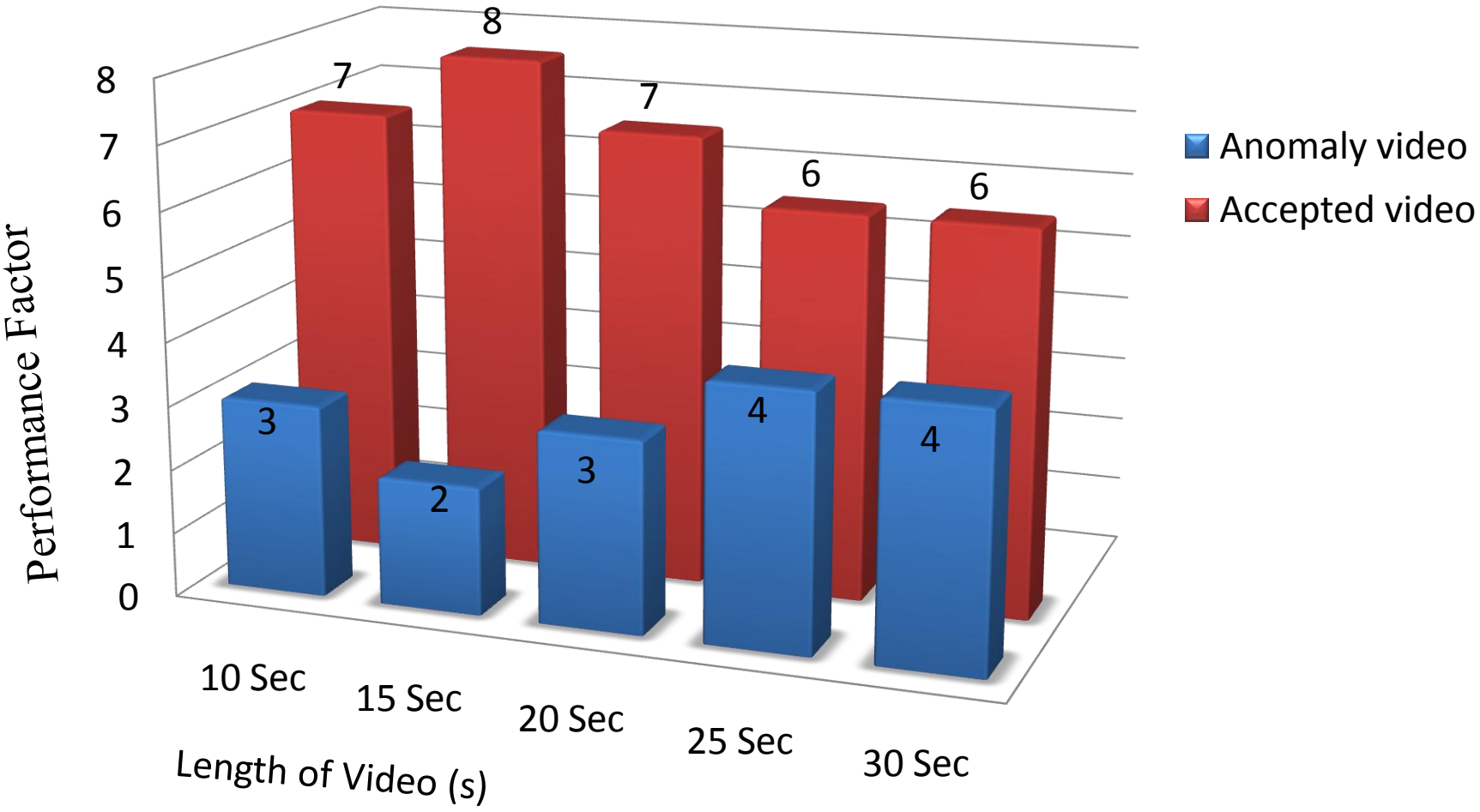
The untrained video with anomaly is now trained to our system so that next time when the system encounters this video Error signal is not generated



Anomaly Detection (Cont.)



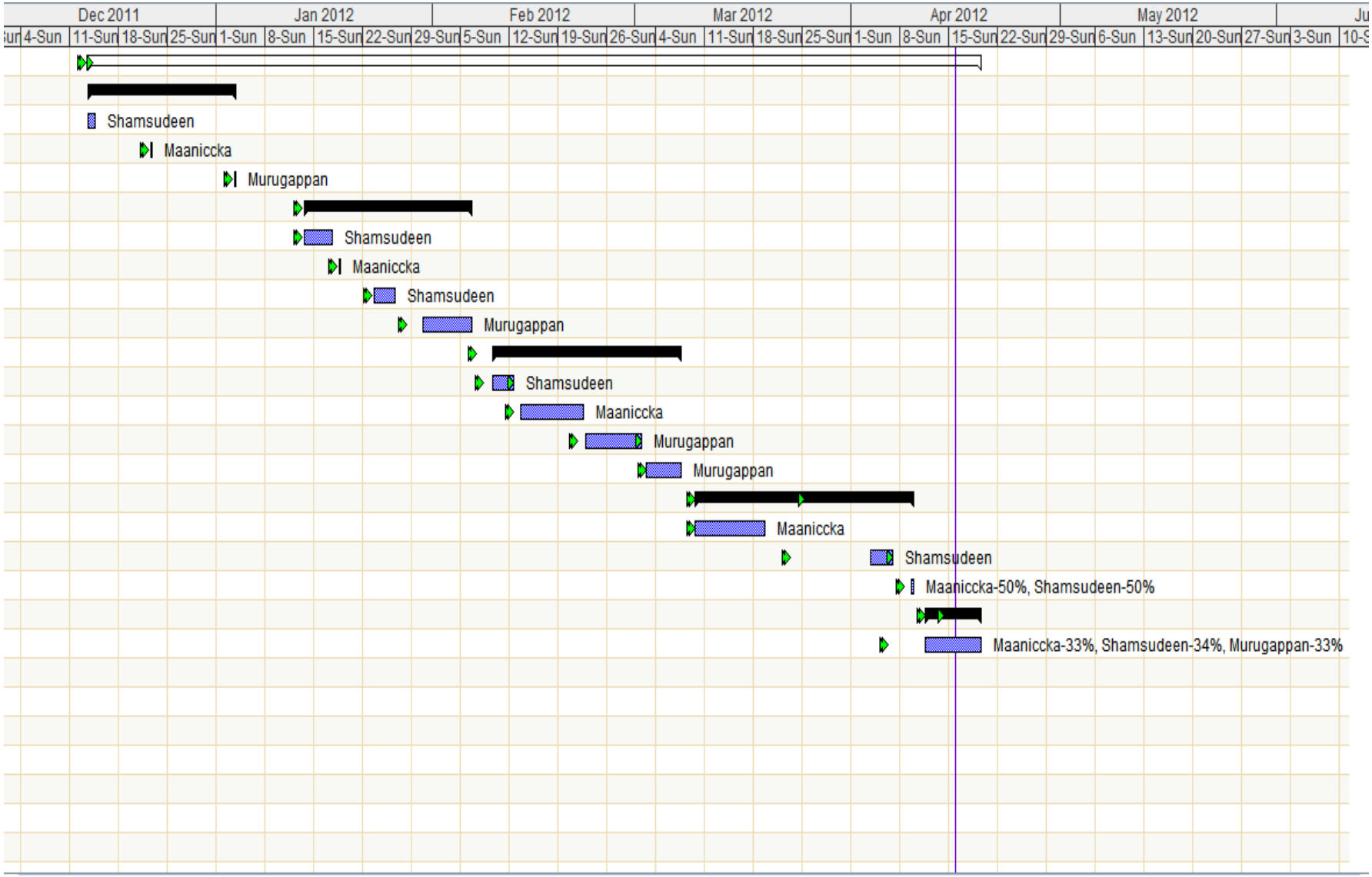
PERFOMANCE ANALYSIS GRAPH



Updated Gantt Chart

Key	Info	Task Name	% Compl...	Work (Hours)	Duration (Days)	Span (Days)	Resources	Start	Finish
1		Human Action Recognition Unde	0	382.8	128.0	43.3		13-Dec-2011...	19-Apr-2012 ...
2		Zeroth Review	0	23.0	21.3	2.9		13-Dec-2011...	03-Jan-2012 ...
3		R0S4	0	10.0	1.1	1.3	Shamsudeen	13-Dec-2011...	14-Dec-2011...
4		R0S5	0	7.0	0.3	0.9	Maaniccka	22-Dec-2011...	22-Dec-2011...
5		Literaure Survey	0	6.0	0.3	0.8	Murugappan	03-Jan-2012 ...	03-Jan-2012 ...
6		First Review	0	87.0	24.0	10.9		13-Jan-2012 ...	06-Feb-2012 ...
7		Premilinary Design	0	16.0	4.0	2.0	Shamsudeen	13-Jan-2012 ...	17-Jan-2012 ...
8		Detailed Analysis	0	7.0	0.3	0.9	Maaniccka	18-Jan-2012 ...	18-Jan-2012 ...
9		Tools Installation	0	24.0	3.0	3.0	Shamsudeen	23-Jan-2012 ...	26-Jan-2012 ...
10		Working with tool	0	40.0	7.0	5.0	Murugappan	30-Jan-2012 ...	06-Feb-2012 ...
11		Second Review	0	144.0	27.0	18.0		09-Feb-2012...	07-Mar-2012 ...
12		Video Analyzer	0	16.0	3.0	2.0	Shamsudeen	09-Feb-2012...	12-Feb-2012 ...
13		Subject Extraction	0	56.0	9.0	7.0	Maaniccka	13-Feb-2012...	22-Feb-2012 ...
21		Blob Image Extraction	0	48.0	8.0	6.0	Murugappan	22-Feb-2012...	01-Mar-2012 ...
14		Pattern Matching	0	24.0	5.0	3.0	Murugappan	02-Mar-2012 ...	07-Mar-2012 ...
15		Third Review	0	80.8	31.4	9.6		09-Mar-2012 ...	09-Apr-2012 ...
16		Anamoly Detection	0	48.0	10.0	6.0	Maaniccka	09-Mar-2012 ...	19-Mar-2012 ...
17		Alert System	0	24.8	3.0	3.1	Shamsudeen	03-Apr-2012 ...	06-Apr-2012 ...
18		Final Demonstration	0	8.0	0.4	0.5	Maaniccka-50%...	09-Apr-2012 ...	09-Apr-2012 ...
19		Documentation	0	48.0	8.0	2.0		11-Apr-2012 ...	19-Apr-2012 ...
20		Final Report	0	48.0	8.0	2.0	Maaniccka-33%...	11-Apr-2012 ...	19-Apr-2012 ...

Gantt Chart (cont.)



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- [4] D. Weinland, R. Ronfard, and E. Boyer, “Free Viewpoint Action Recognition Using Motion History Volumes,” Computer Vision and Image Understanding, vol. 103, nos. 2-3, pp. 249-257, Nov. 2006.
- [5] T. Syeda-Mahmood, M. Vasilescu, and S. Sethi, “Recognizing Action Events from Multiple Viewpoints,” Proc. IEEE Workshop Detection and Recognition of Events in Video, pp. 64-72, 2001.