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Video Based Behaviour Modelling System for Drug Testing Application

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Abstract: Behavioural modelling is used in every aspect of human life, system design, testing, verification in all domains. The behavioural modelling can be created with respect to time and change of the object. In this paper we are going to analyse the behaviour of the object with respect to time and its behavioural change. Also the analysis will be based on object tracking method. We examine this analysis for to study the animal behaviour. The purpose of the system is also to observe the micro movements of the objects. We also have done the detection of the live object and the tracking of live object. Also the live video has been captured. It allows the recording of activity, events, behavioural interactions and performs the calculations of wide range of analysis parameters. Some parameters are provided like eating food, drinking water, resting and based on these parameters the behaviour of the object will be recorded respect to time and change.

Keywords: Behavioural Modelling, Object Tracking, Video Analysis, Computer Modelling.

I.INTRODUCTION

Video following has demonstrated helpful in behavioural exploration, making parameters, for example, speed, separation moved, and area simple to identify.

Acknowledgment of more perplexing practices, for example, raising and preparing has been a greater amount of test to naturally perceive. As of not long ago: presenting programmed conduct acknowledgment for rats and mice!

In the past frameworks the information will be recorded physically a large portion of the times consequently to overcome from this issue we have outlined this framework, a coordinated framework for programmed recording of action, developments, and communications of items.

Our product is exhibited, highlighting some key components that different our framework from different frameworks. Our framework just depicts the manual versus robotized behavioural perception.

The conduct of the creature is recorded physically before the robotized behavioural perception framework. Which implies the researcher watches the object(mouse), if the scientist establishes that specific conduct design showed, they takes note of the conduct either by entering so as to record or information into an occasion recording program.

It turns out to be more convoluted to watch the conduct physically. To cover this issue our framework will watch the conduct of the article through camera.

In the framework object following not just permits the information obtaining of the spatial position of article additionally the automatic location of a scope of particular practices.

There are two recordings which will we gave by us as information the principal video is for conduct of mouse before medication infusion and the second video is of after medication testing.

In the wake of giving these recordings to the framework it will recognize the article in the video and track the item utilizing object following. It will think about those both recordings according to a few parameters which are determined.

The fundamental parameters are given like eating sustenance, drinking water, resting and so on.

After this the framework will think about both resultant factual information on the premise of given parameters concerning time and change in the conduct.

The framework can catch the small scale developments of the item. It will watch the occasions, developments of item from the principal video and in addition from the second video, analyse the information and store the record into the database.

As we have talked about before this perception of the item through the framework will diminish the endeavours of the researchers/the scientists.

The gathering of mouse is enormous information in this manner, it will likewise supportive to deal with this kind of huge information.

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II. LITERATURE REVIEW

Paper Title	Public.	Year	Technical Detail
Video-based Animal Behaviour Analysis From Multiple Cameras	IEEE	2006	Framework for automatic video based behaviour analysis system, which focus on BBU discovery using the affinity graph method on the feature data extracted from video images.
An Experimental Setup for Measuring Distance and Duration of Rat Behavior	IEEE	2012	Method for measuring rat's behaviour in the elevated plus maze and whole board model test. This method consists of two processes first K-mean Clustering and second Background Subtraction.
Performance analysis of Various Key Frame Extraction Methods for Surveillance Application	IJETAE	2014	Edge Change Ratio (ECR) method, Colour Histogram method and Distance Based method used for key frame Extraction.
Behaviour Recognition in Laboratory Mice Using HRF Video Analysis	IEEE	2011	This paper states that, How to extract the individual frames from High Frame Rate Videos i.e. for 240 fps.
EthoVision: A versatile videotracking systemfor automation of behavioral experiments	Noldus Information Technology	2001	An integrated system which overcome the problem of video recording like automatic recording of activity, movement and interactions of animal.

III. OBJECTIVE AND STUDY

The main purpose of our project is to focus on reducingthe manual work in laboratories which perform drug testing on animals. We are developing a system which can considerably reduce the time and improve the accuracy of the end result.

The final developed software will capture live video and convert the information captured from the video and transform it directly on the user's computer in tabular/Graphical form, enabling the user (drug tester) to easily analyse the changes in the behaviour of the object (mouse) without having to stand hours in front of it and taking the notes for each and every minute changes in the object's behaviour.

IV. DATA AND METHODOLOGY

We propose a system which makes use of a Camera computer, a video storage device, a cage and an object (preferably a mouse) in a drug testing laboratory .The camera will capture the object moving inside the cage, its movements will be recorded and sent to the storage device which will store the video and sent it to the computer. Our Software System will make use of the selected algorithm, analyse the captured video and convert it into statically/graphical data on the user's screen.

V. SYSTEM ARCHITECTURE

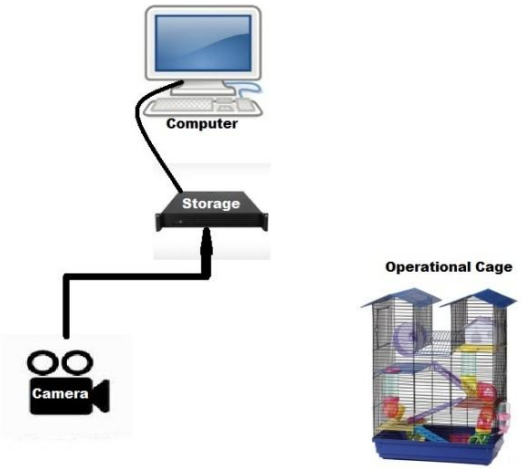

Figure 1.1: Generalized System Architecture

VI. MODELLING

1. Mean shift algorithm

Mean shift is a non-parametric feature-space analysis technique used as a mode seeking-algorithm. Application domains include cluster analysis in computer vision and image processing. Mean shift is an application-independent tool suitable for real data analysis. It does not assume any predefined shape on data clusters. It is capable of handling arbitrary feature spaces. The procedure relies on choice of a single parameter: bandwidth. The bandwidth/window size 'h' has a physical meaning, unlike k-means. It is mainly used for 3 purposes:-

1. Clustering.
2. Tracking.
3. Smoothing.

2. Cam shift

Camshift is one of the simplest and effective algorithms. Applies mean shift first. Once mean shift converges, it updates the size of the window as, s=2×M00256. It also calculates the orientation of best fitting ellipse to it. Again it applies the mean shift with new scaled search window and previous window location. The process is continued until required accuracy. The algorithm Camshift, Continuously Adaptive Mean Shift, encapsulates that of Mean-Shift in a loop by varying the size of the window until convergence. At each iteration, the mean shift is applied with a given size window. After convergence of the mean shift, the process is re-iterated with a window cantered on the position found by the mean shift, but feature size zero order moment of the spatial distribution of the probability of skin colour previously calculated the mean shift.

The Camshift applies to the segmentation of still images: after convergence of the mean shift, the height of the window is chosen 20% larger than its width, but this choice is arbitrary. It is suitable to the case of segmenting

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the images with faces or images that deal with the facial expressions.

3. Colour Histogram

In image processing and photography, a colour histogram is a representation of the distribution of colours in an image. For digital images, a colour histogram represents the number of pixels that have colours in each of a fixed list of colour ranges that span the image's colour space, the set of all possible colours.

The colour histogram can be built for any kind of colour space, although the term is more often used for three-dimensional spaces like RGB or HSV. For monochromatic images, the term intensity histogram may be used instead. For multi-spectral images, where each pixel is represented by an arbitrary number of measurements (for example, beyond the three measurements in RGB), the colour histogram is N-dimensional, with N being the number of measurements taken. Each measurement has its own wavelength range of the light spectrum, some of which may be outside the visible spectrum.

If the set of possible colour values is sufficiently small, each of those colours may be placed on a range by itself; then the histogram is merely the count of pixels that have each possible colour. Most often, the space is divided into an appropriate number of ranges, often arranged as a regular grid, each containing many similar colour values. The colour histogram may also be represented and displayed as a smooth function defined over the colour space that approximates the pixel counts. Like other kinds of histograms, the colour histogram is a statistic that can be viewed as an approximation of an underlying continuous distribution of colours values.

4. Background subtraction

As the name implies it is used for subtracting or separating foreground objects from the background objects in the form of sequence of frames. It is widely used when there is a static camera and the movements of live objects need to be recorded and captured. Makes use of frame difference method.

Difference between the frames is calculated by {Framei-Framesi} Th. Here The is sensitive threshold.

VII. CONCLUSION

We would like to conclude that we are learning to develop a Video Based Behaviour Modelling System for Commercial use of Drug Testing. “Curiosity and will for hard work leads to development of new technology”. We are eager to learn an invent more innovative, effective ways for Drug Testing which could be applied and which indeed will contribute to the domain of Health Care.

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REFERENCES

[1]. Xinwei Xue and Thomas C. Henderson, “Video-Based Animal Behavior Analysis from multiple cameras”, IEEE International Conference, Tech Report UUCS-06-006, University of Utah, 2006.
[2]. J. Aggarval and Q. Cai, “Human motion analysis: A review,” Computer Vision and Image Understanding, vol. 73, no. 3, 1999.
[3]. W. Hu, T. Tan, L. Wang, and S. Maybank, “A survey on visual surveillance of object motion and behaviors,” IEEE Transactions on Systems, Man, and Cybernetics, vol. 34, no. 3, pp. 334–351, 2004.
[4]. Yuman Nie, Takeshi Takaki, Idaku Ishii, and Hiroshi Matsuda, “Behavior Recognition in Laboratory Mice Using HFR Video Analysis”, Shanghai International Conference, 2011.
[5]. Theekapun Charoenpong, Yuttachon Promworn, Phatchariya Thangwiwatchinda, “An Experimental Setup for Measuring Distance and Duration of rat Behavior”, 2012
[6]. J. Barbic, A. Safonova, J.-Y. Pan, C. Faloutsos, J. K. Hodgins, and N. S. Polland, “Segmenting motion capture data into distinct behaviors,” in Proceedings of Graphics Interface 2004 (GI’04), (Canada), May 2004.
[7]. I. Ishii etal., “Automatic Scratching Pattern Detection for Laboratory Mice using High-speed Video Images,” IEEE Trans. Automat. Sci. Eng., 5(1), 176–182, 2008. X. Su and T. M. Khoshgoftaar, “A survey of collaborative filtering techniques,” Adv. Artif. Intell., vol. 2009, p. 4, 2000
[8]. H. Ishii, M. Ogura, S. Kurisu, A. Komura, A. Takanishi, N. Iida and H. Kimura, “Development of Autonomous Experimental Setup for Behavior Analysis of Rats”, Proc. of the 2007 IEEE/RSJ Int. Conf. on Intelligent Robots and Systems, USA, pp: 4152-4157, Nov, 2007.
[9]. Y. Nie, I. Ishii, K. Yamamoto, T. Takaki, K. Orito and H. Matsuda, “High-speed Video Analysis of Laboratory Rats Behaviors in Forced Swim Test”, 4th. IEEE Conf. on Automation Science and Engineering, USA PP: 206-211, Aug. 2008.

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