DrugEffectScan

Features:

- Specialized TopScan module for Drug Effect stereotypic behaviors
- Includes *LocoScan* component of TopScan
- High-Throughput capability up to 32 arenas simultaneously
- Real-time or offline
- Continuous lengthy recordings and analysis possible
- Easy plug-n-play functionality
- No user intervention required during experiment
- Detailed statistics about events that occurred during the experiment
- Automated Binned Data Output
- Automatic Graphing and Charting included!
- Validated with respect to human scoring
- Full color-analysis
- Automatic adaptation to changing environment, non-uniform lighting, etc.
- Result review, Visualization of Acquired Experiments
- Extensive Experiment Database Management included!
- Batch-mode allows user to run multiple videos successively without human intervention
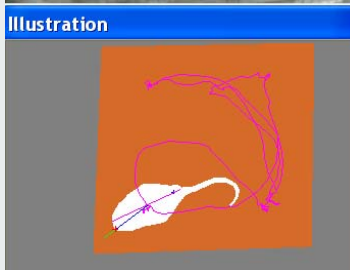
Events DrugEffectScan can detect:

- Darting
- Head Waving
- Zone Visits
- Cross Over
- Speed
- Dist to Points
- Dist to Zones
- Orient to Points

- Motion
- In-place Motion
- Immobility
- Elongation
- Shape

Additional functionalities:
- Circling
- Flat-back Approach
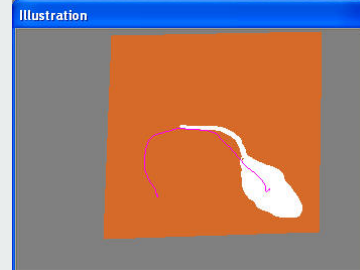- Grooming
- Thigmotactic Behaviors

DrugEffectScan is an optional module for TopScan that is a powerful and effective tool for detecting 3 commonly occurring behaviors of animals under drug effects.

DrugEffectScan provides two functions that can reliably detect two commonly occurring behaviors under drug effects: head waving and darting. An animal such as a rat or a mouse often waves its head quickly to one side and then to the other side while keeping it body relatively stable. Studies at University of Michigan have shown head waving is a stereotypic behavior for an animal under drug effects, and thus can be used as indication for drug influence. Darting is another behavior that often occurs with animals under drug effects. Animal often accelerates quickly and then stops rapidly. This is another stereotypical indication of drug abuse.

DrugEffectScan reliably detects head waving by providing many measurements of this behavior, including number of times the head turns to the left, number of times the head turns to the right, and the frequency of head waving. DrugEffectScan also detects how many darting behaviors occur during testing, and gives measurements of speed and distance for each darting behavior.

Head Waving   **Darting Behaviors**

DrugEffectScan is bundled with the LocoScan module of TopScan that measures all open-field activity, including zone visits, crossovers, speed, motion, immobility, elongation, shape, other measure relating to distance and orientation to certain landmarks in the arena. To this, other modules of TopScan may be added.

Clever Sys Inc.

Behavior Recognition
Innovation makes the difference

DrugEffectScan
(Continued from front)

Applications:

- Open Field, Locomotor Activity
- Drug Effect Analysis
- Place Preference
- Light/Dark Box
- And many more!

Results:

- Objective Drug Effect related Behavior Recognition Results
- Automatic Export to Excel
- Complete Experiment Database Management
- Summary of All Occurred Events, Times of occurrence, Durations, Latency to occurrence, various measures during occurrence
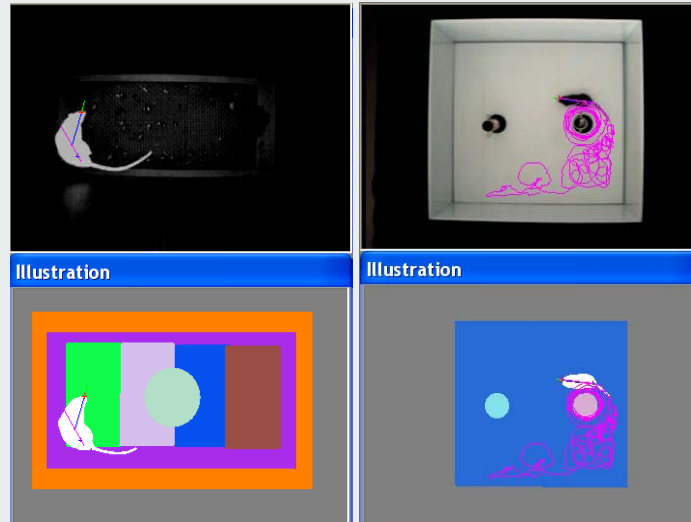- Binned data at user-defined

Product Options:

- High-Throughput Option (H Option)
- Realtime Option (R Option)
- High-Throughput Realtime Option (HR Option)

Requirements:

- Windows-based PC
- Intel High-speed Processor
- Special Videocard for realtime analysis
- Large HDD space for storage
- Good lighting conditions
- IR-switchable camera or red-light for night
- Video-multiplexer for multi-camera feed

Additional functionalities for integration into TopScan include Circling, Flat-back approach, Grooming and Thigmotactic behaviors. With the addition of these behaviors, DrugEffectScan becomes a powerful tool for measuring a broad range of stereotypic behaviors.

Stereotypic Behaviors

DrugEffectScan can be applied to achieve high throughput screening as well. System architecture for high throughput screening has been designed that involves analysis of up to 32 arenas on a system, depending on how large the arenas are. Such high levels of throughput are possible as we can integrate multiple cameras together into the TopScan system. The High-Throughput product option is necessary to analyze more than a single arena simultaneously. The Realtime Option is necessary to perform realtime analysis where the live video feed into the computer is compressed, encoded, saved to the hard drive while simultaneously full analysis of the video is performed.

Many advanced features are incorporated, including supporting full color analysis, automatic adaptation to non-uniform or changing environment, automated handling of light/dark areas, variable speed playback of specific video segment for specific detected behavior, etc.

Complete Turn-key systems including all necessary Hardware and Software are available. Custom design of your environment to facilitate analysis, including lighting condition setup, IR/red light setup, cage enclosures, video integration, and video-feed to computer is also available.

Unique Capabilities:

- Complete Hardware and Software Solution
- Detects drug effect and other related stereotypic behaviors
- Analyzes 640x480 at 30 frames per sec
- Detects animals in low contrast also!
- Works with rodents of all colors/sizes
- Integrates with 3rd party devices/bio-signals
- Controls other hardware devices via I/O ports
- Records video into storage during analysis

Clever Sys Inc.
The Behavior Recognition Company

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Medical Arts & Photography Branch
Office of Research Services, NIH

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