



Revolutionizing Behavior Research



LocoScan

Features:

- Top-View based Open Field Behavior Analysis software
- Integratable with any of *MazeScan*, *WaterMazeScan* & *ObjectScan* into *TopScan* framework
- High-Throughput capability up to 32 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 to be more than 90% accurate 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

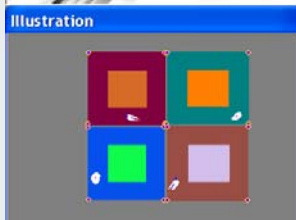
Events LocoScan can detect:

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> • Zone Visits • Cross Over • Speed • Dist to Points • Dist to Zones • Orient to Points | <ul style="list-style-type: none"> • Motion • In-place Motion • Elongation • Immobility • Shape | <p>Additional functionalities:</p> <ul style="list-style-type: none"> • Circling • Flat-back Approach • Grooming • Thigmotactic Behaviors |
|---|--|--|

Analyzing locomotor activity is an important behavioral assay for rodents, especially mice. Locomotion experiments are used to test the levels of activity of the animals, rhythms of their movements including randomness, inclination to stay close to the walls or move closer to the center of the arena, etc. Many such experiments are conducted with drugs (amphetamine, dopamine) being administered to the animals. Often such experiments need to be conducted with multiple animals/cages simultaneously.

LocoScan fills this need and allows automated analysis of locomotor activity by analyzing video taken from the top. The system has the flexibility that the mouse can be placed in a cage with or without bedding. LocoScan outputs detailed statistics about locomotor behavior such as total distance traveled, average speed, turning angle, and elongation. It also allows the user to divide the cage or arena into zones of any shape as he/she wants and LocoScan will output zone-specific statistics including zone entry and exit statistics, average speed and turning angle within each zone, length of stay in each zone, etc. In addition, it makes differentiation between InPlaceMovement (time staying in same place while doing minor movements) and Locomotion (time moving around), which is a feature demanded by many scientists. It also gives the detailed locomotion parameters for each behavior bout, including "Locomotion" and "InPlaceMovement."

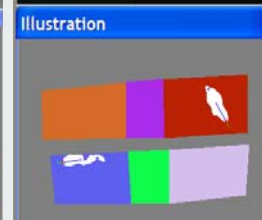
LocoScan provides 2-dimensional information about the animal, such as its shape and elongation information and turning angle information. LocoScan also allows the user to define points and lines and obtain measures or detect events based distances from these points/lines. If purchased along with *MazeScan* which allows reliable identification of animal's major body parts such as nose, forelimbs, and tail base, LocoScan can be very powerful as the user has the capability to detect the presence of any body part anywhere.



4-Arena Open Field



Light/Dark Box



Place Preference



LocoScan

(Continued from front)

Applications:

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

Results:

- Objective 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 bin intervals

Product Options:

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

Requirements:

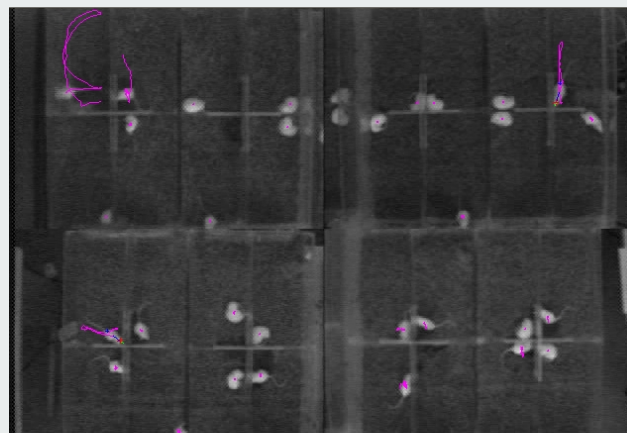
- Windows-based PC
- Intel High-speed Processor
- Special Videocard for realtime analysis
- Large HDD space for storage
- Good lighting conditions
- IR-switchable camera or red-light for night
- Video-multiplexer for multi-camera feed

Other Events LocoScan provides include Speed (when does an animal move faster than 10 cm/s?), Shape (when does the animal stay curled up?), Elongation (when is the animal stretched out?), Rearing (based on shape), Motion Level, Immobility (When is the animal still?), and Cross Over. The system has capabilities to handle special cases, including the ability to measure locomotion of a rat in a small cage, where the rat body takes up a large percentage of the space and moves slowly with great constraints, making it previously extremely difficult to calculate locomotion. Our novel design gives accurate measurements of rat's locomotion.

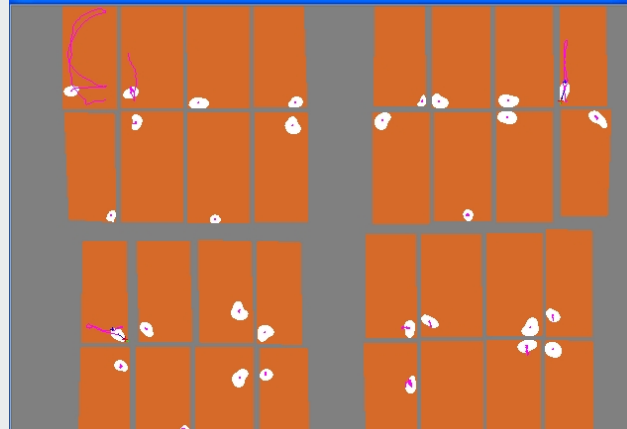
LocoScan can be applied to achieve high throughput screening as well. System architecture for high throughput screening has been designed that provides analysis of up to 32 arenas on a system (as shown in figure below), depending on how large the arenas are. Such high levels of throughput are possible 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.



Illustration



Unique Capabilities:

- Complete Hardware and Software Solution
- Analyzes 640x480 at 30 frames per sec
- High-Throughput version allows up to 32 arenas to be analyzed simultaneously in realtime, at 30 frames per second!
- 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