



Revolutionizing
Behavior Research



GroupHousedScan



Beta Version Now Available!!!

Features:

- Complete Dual-View Behavior Recognition software
- Includes functionalities of *TopScan*, *SocialScan* & part of *HomeCageScan*
- Each arena is devoted two cameras, one from top and another from the side
- Can handle multiple animals group housed in a single cage (max 4 animals)
- High-Throughput capability up to 2 arenas simultaneously
- Real-time or offline
- Continuous lengthy recordings and analysis possible
- No user intervention required during experiment
- Detailed statistics about events that occurred during the experiment
- Automated Binned Data Output
- Automatic Graphing and Charting included!
- 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 GroupHousedScan can detect:

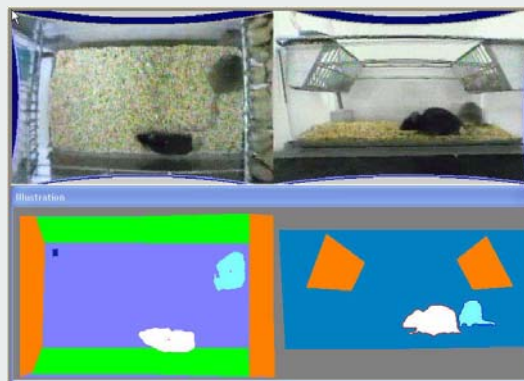
- | | | |
|-------------------------|-------------------|--------------------|
| • Active Contact | • Zone Visits | • Rear Up |
| • Passive Contact | • Crossovers | • Come Down |
| • Approach | • Speed | • Hang |
| • Leave | • Motion | • Walk |
| • Follow | • Dist to Zone | • Eat |
| • Sniff at other | • Orient to Point | • Drink |
| • Contact by Body Parts | • Shape | • more to be added |

Long-term monitoring of animals in their home environment has been the Holy Grail for behavior scientists. Heretofore, it has been only possible with our *HomeCageScan* system, with the limitation that there can only be a single animal in the cage.

Solitary housing of animals for extended periods of time is sometimes not a feasible solution. Moreover, rodents are social animals and their natural behaviors are best studied while they are housed as a group, with minimal intervention by humans.

GroupHousedScan is the most comprehensive behavior analysis system available, that can analyze behaviors of multiple animals in their home cage or any other arena. In behavior research area, many researchers want to study both the activity and life pattern of an animal at the same time. General speaking, activity can be best quantified through top view analysis (e.g., locomotion), while side view analysis provides much more detailed information on animal's circadian rhythm (e.g., natural behaviors like, eat, drink, sleep, walk, jump, rear up, hang, groom, sniff, twitch, stretch, etc.). Acquiring measures of both activity and life pattern at the same time has become more and more important in behavior research.

GroupHousedScan is a premier behavior analysis system which aims at analyzing animal behavior thoroughly, reliably and efficiently. It integrates both top view and side view information, thus providing overall information including activities and life patterns, and lays a good foundation for complex social behaviors.



Detailed Top & Side View Behavior Analysis



GroupHousedScan

(Continued from front)

Applications:

- Any task needing TopScan and HomeCageScan analysis simultaneously!

Results:

- Objective Behavior Recognition Results
- Comprehensive Top- and Side-view based behavior analysis
- Applicable to almost any task
- Automatic Export to Excel
- Complete Experiment Database Management
- Summary of All Occurred Events, Behaviors, Times of occurrence, Durations, Latency to occurrence are provided
- 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

GroupHousedScan observes multiple-animal behavior in a cage or an enclosure, from both top view and side view, and outputs detailed behavior sequence as well as specific events (such as eating, drinking, staying in specific zone, etc) as well as digital event inputs (e.g., TTL input changes by photo-beam, lever-pressing, etc.). With GroupHousedScan, one can finally obtain all the information one will ever need in a single system. For example, it will provide accurate distance traveled information and zones visited from the top view, while the side will provide behaviors such as rearing, eating, sleeping, grooming, etc. It provides truly the most comprehensive analysis possible. Moreover, it is a social interaction analysis system and can detect social behaviors such as contact, degree of contact, approach, leave, sniff, etc.

GroupHousedScan system comprises two cameras focused on a single cage, one camera from the top and another from the side. The Top-view camera may be placed inside or outside the cage as long as a clean view of the bottom floor of the cage is visible. A custom designed arena with clear side walls is also an alternative option to the standard rodent cage. The side view camera is placed just like in HomeCageScan. Video from the two cameras are combined and synchronized for analysis.

GroupHousedScan may be applied to any task that requires analysis from two views. Typically, a single view analysis (either Top-view alone or Side-view alone) will have to compromise on result quality by making certain approximations. For example, the TopScan cannot detect rearing accurately, while HomeCageScan cannot detect distance traveled and visits to different parts of the cage accurately. GroupHousedScan allows no compromise on quality. Since TopScan has 4 components (LocoScan, ObjectScan, MazeScan, and WaterMazeScan), the user still has the option to choose which components to purchase. Purchase of all components is not necessary. Hence, GroupHousedScan with just the LocoScan component or the entire TopScan may be purchased. We provide total flexibility to the user. The hallmark of GroupHousedScan is simply the framework allowing both views to be integrated.

Flexible and powerful exporting tools are provided, which allows the user to get results in the format they want. Advanced features such as protocol control (starting/stopping of recording), batch mode, and result review are supported. Double-clicking each behavior record in the event record window or the behavior sequence window will playback the video segment corresponding to that occurrence, facilitating validation and detailed study. It also provides sophisticated and easy to use experimental data management system, and advanced feature-based group export function to allow export of multiple animals' results into a comprehensive Excel file. Powerful visualization mode allows review of the analysis process, ability to load alternative parameter settings, and export of various statistical measures and graph data.

All components of GroupHousedScan 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 2 arenas on a single 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, 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
- Comprehensive Top- and Side-view Analysis
- 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