



Revolutionizing  
Behavior Research



# ChamberScan

## Features:

- Complete Dual-View Operant Chamber Behavior Recognition software
- Includes functionalities of *TopScan* & part of *HomeCageScan*
- Each arena is devoted two cameras, one from top and another from the side
- High-Throughput capability up to 2 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!
- 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 StereoScan can detect:

- |                    |                   |             |
|--------------------|-------------------|-------------|
| • Nose-poke        | • Speed           | • Rear Up   |
| • Lever-press      | • Motion          | • Come Down |
| • Zone Visits      | • In-place Motion | • Walk      |
| • Dist to Points   | • Shape           | • Jump      |
| • Dist to Zones    | • Turn            | • Groom     |
| • Orient to Points | • % Body In       | • Eat       |
|                    |                   | • Drink     |
|                    |                   | • Sleep     |

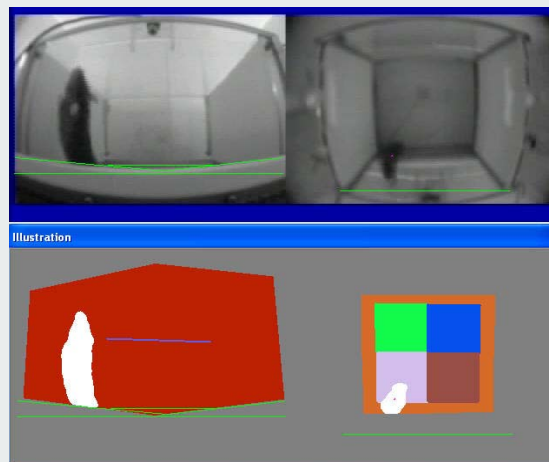
Operant Chamber Behavior is an important aspect of animal behavior. Many researchers want to study the activity before or after specific events that typically occur inside an operant chamber such as nose-poke, lever-press, eating, drinking, etc. Behavior paradigms such as fear-conditioning and self-administration widely use operant chamber behavior.

ChamberScan is a premiere behavior analysis system which aims at automating operant chamber behavior analysis accurately, reliably and efficiently. It integrates both top view and side view information, thus provides overall information including activities and life patterns.

ChamberScan observes single-animal behavior in an operant chamber, from both top view and side view, and outputs detailed behavior sequence as well as specific events (such as eating, drinking, nose-poke, staying in specific zone, etc) as well as digital event inputs (e.g., TTL input changes by photo-beam, lever-pressing, etc.).

With ChamberScan, one can finally obtain all the information one will need to assess activity inside an operant chamber. In a typical self-administration study, for example, the hardware device comes with basic software that counts certain static events such as lever-presses and nose-pokes using photo-beams. But, those static events correspond to less than 1% of total experiment time. So, what happens during the remaining 99% of the experiment?

ChamberScan is the solution designed to answer that simple but important question. ChamberScan analyzes behavior over the entire experiment duration and outputs precisely what the animal was doing at ALL times, especially, contextually with those aforementioned static events – that is, what happens just before and after a lever-press? Does the animal immediately look in a specific direction? Does it move to a different area? etc.



Detailed Top & Side View Operant Chamber Behavior Analysis



## ChamberScan

(Continued from front)

### Applications:

- Any Operant Chamber Behavior Analysis
- Self-administration
- Fear-conditioning
- Reward/Gambling Studies

### Results:

- Objective Operant Chamber Behavior Results
- Comprehensive Top- and Side-view based behavior analysis
- Applicable to almost any operant chamber 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

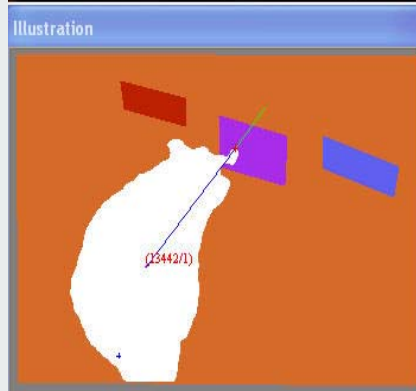
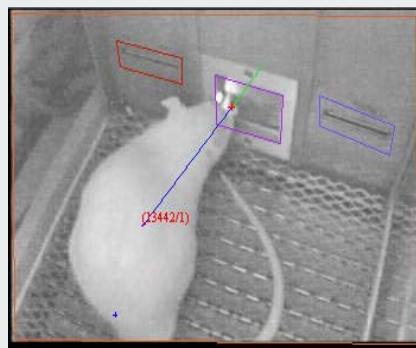
ChamberScan system comprises two cameras placed inside an operant chamber, one camera from the top and another from the side. Video from the two cameras are combined and synchronized for analysis. Custom designed chambers or specialty cages are also good candidates for analysis.

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.

ChamberScan 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 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, 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
- Comprehensive Operant Chamber Behavior Analysis for throughout the experiment
- Comprehensive Top- and Side-view based behavior analysis
- Analyzes 640x480 at 30 frames per sec
- Detects animals in low contrast also!
- Works with rodents of all colors/sizes
- Integrates with 3<sup>rd</sup> party devices/bio-signals
- Controls other hardware devices via I/O ports
- Records video into storage during analysis