



Revolutionizing
Behavior Research



WaterMazeScan

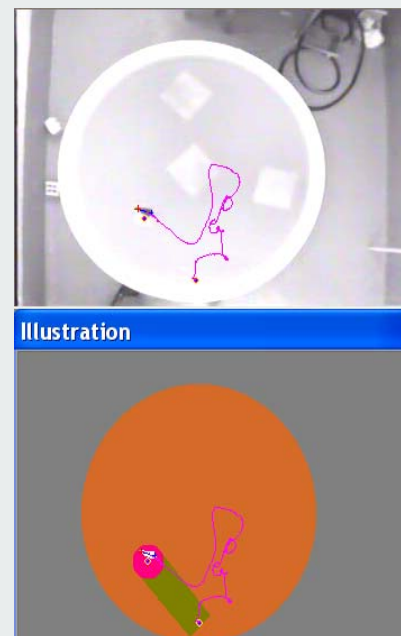
Features:

- Complete Top-View based Water Maze Behavior Analysis software
- Designed for Morris Water Maze
- Integratable with any of **LocoScan**, **ObjectScan**, and **MazeScan** into **TopScan** framework
- High-Throughput capability with 4 or more 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 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 MazeScan can detect:

- | | |
|-----------------------------|--------------|
| • Zone/Quadrant Visits | • Speed |
| • Dist to Points | • Motion |
| • Dist to Zones/Platform | • Shape |
| • Orient to Points/Platform | • Elongation |
| • Turn Around | |

WaterMazeScan automates the analysis of the popular Morris Water Maze experiment. The video is taken of the water maze experiment from the top, and WaterMazeScan will analyze this video to give a variety of significant results.



WaterMazeScan detects all the traditional analysis measures of a water maze experiment, including: latency, swimming path length, mean swimming velocity, and percent time spent in quadrants and annuluses. It also supports the Atlantis Platform paradigm and generates data accordingly. The control unit for the Atlantis Platform is available.

In addition, WaterMazeScan detects many novel parameters that are of interest to the research scientists in the field. These parameters include:

Turning ratio: Ratio of path length over number of turns, where number of turns is counted when the animal makes a turn larger than X degrees (X is specified by the user, default value is 90) when the animal travels one body length,

Proximity score: A score calculated by determining the distance of the animal from the goal (platform) during each second of the trial and is used as a measure of deviation from the ideal path to the platform once an animal is placed in the cage

Heading error: A measure defined as an instance of swimming away from the VISIBLE platform, measured in deviation angle.



WaterMazeScan

(Continued from front)

Applications:

- Morris Water Maze

Results:

- Objective Water Maze Behavior Analysis 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

The system can accommodate different experiment strategies, such as (1) The usual 'Quadrant A' strategy, where the water maze is split into 4 quadrants and within one specific quadrant - quadrant A - the platform is moved around after every trial. (2) 'Thigmotactic' where the platform is moved within 30 cm of the outside wall and moved at random around the wall. Other strategies can be applied as well. Besides, the water maze itself can be divided into zones of any shape as users like and data with regard to each zone will be analyzed, such as number of entries and exits of each zone, and time spent in each zone.

The Turn Around behavior detection has been specially developed for WaterMazeScan. In the Water Maze, the rodents have complete freedom of movement and tend to make quick turns. WaterMazeScan measures the number of such Turn Around episodes as well as the number of turns and total angle of turns.

Other important events detected by WaterMazeScan includes events based on distance to a point, say, the Start Point (Insertion Point), or the Destination Point (Platform Center), events based on orientation to a Point, events based on deviation distance away from a straight path, etc.

All detected events are output as a list. Double-clicking each item on the list will playback the video segment corresponding to that occurrence, facilitating validation and detailed study. WaterMazeScan also includes a sophisticated and easy to use experiment data management mode that organizes results of all animals/trials in an experiment in a database. From this database, the advanced feature-based group export function allows exporting of all or multiple results from a given experiment into a comprehensive Excel file.

The powerful Visualization Mode allows full review of the analysis, ability to load alternative parameter settings, and export of various statistical measures and graph data.

With the high-throughput option, WaterMazeScan can analyze anywhere from up to 4 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
- Analyzes 640x480 at 30 frames per sec
- Detects animals in low contrast also!
- Works with rodents of all colors/sizes
- Works with many difference Water Maze experiment paradigms including Atlantis Platform
- Integrates with 3rd party devices/bio-signals
- Records video into storage during analysis