



Innovative solutions for behavioral neuroscience

*Powerful software tools, fully integrated labs, and expert consultancy.
Trust our 30 years of experience to make your project a success.*

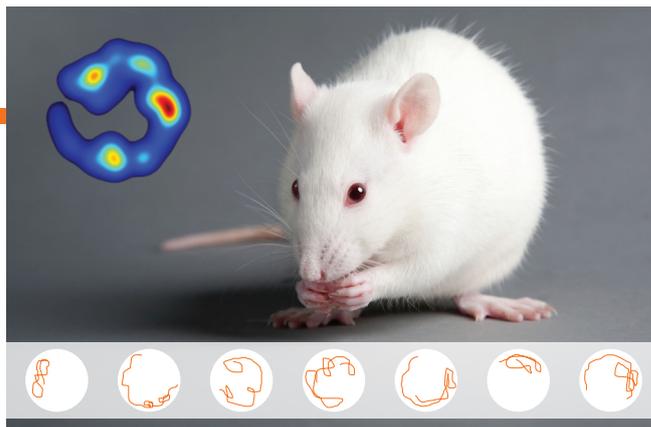
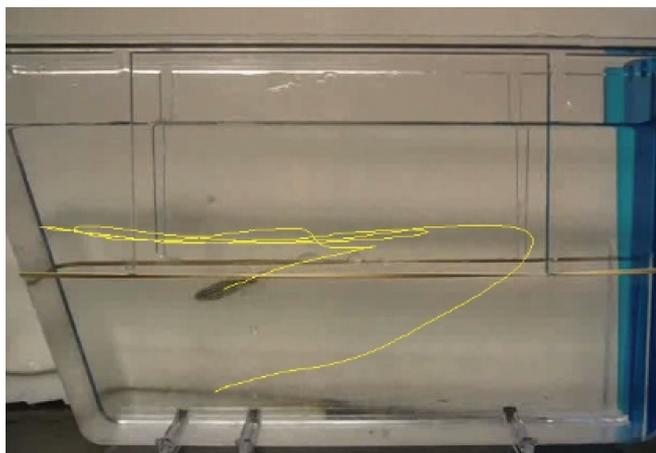
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Noldus
Information Technology

EthoVision XT

- *Reliable video tracking of any animal*
- *Cost-effective & easy-to-use software*
- *High-throughput & high-content testing*
- *Powerful analysis tools for insightful results*

EthoVision® XT is the most flexible and versatile software system for highly accurate video tracking, activity detection, and analysis of animal movement and behavior. It has evolved over 25 years and is in use at over 2500 sites worldwide in a broad range of research set-ups. EthoVision XT is a platform for any experiment from straight-forward testing (such as water maze or open field) to sophisticated protocols including social interaction, hardware control, behavior recognition, operant conditioning, optogenetics, and external (physiological) data collection and analysis. And you can use it in practically any arena. Track live or from video. After data collection, easily group, nest, and filter for in-depth analysis or export raw data to your statistical program. You can also export visuals at high resolution for publications and presentations.



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A PLATFORM TO BUILD ON

As your research progresses, your EthoVision XT video tracking platform evolves. Tracking of multiple body points is always part of EthoVision XT Base. This includes the new Deep Learning technology. But you might want to customize your solution. Incorporate the control of lights, audio, optogenetics, or the input from levers or running wheels. Track multiple animals in social interaction studies. Or do you want to increase throughput with multiple arenas? No problem. With several add-ons available, you truly have a platform to build on.

BENEFITS

EthoVision XT is by far the most cited video tracking software. So why do researchers like it? Transparency is key. Instead of being a 'black box', EthoVision XT gives you full insight. You can see all your data, as numbers and track. You also have full control over these data. The detection of your animal is very accurate, so your tests can be sensitive. A wide range of analysis tools help you get everything you need out of your data, effectively and efficiently. Great visuals (tracks, graphs, heatmaps) can be exported for publication. Are you a novice and need some help along the way? EthoVision XT has built-in video tutorials too, right where you need them. More experienced users love the quick set-up options, templates, and advanced creating of custom parameters.

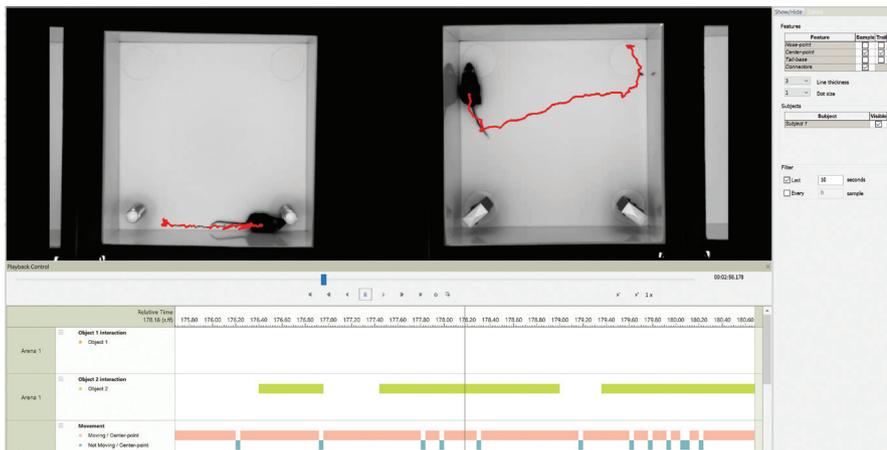
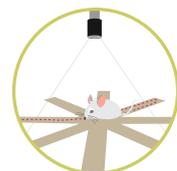


DEEP LEARNING

EthoVision XT is unique because of the superior detection methods. Tracking is based on either the contour detection of the animal, or on a new technology called Deep Learning. For rats and mice, EthoVision XT can now detect and track the body points based on information from trained neural networks. The big advantage here is that tracking is a lot more accurate and stable this way: Less swaps of the nose and tail when animals are grooming or turning around. No confusion with reflections. In other words: unsurpassed tracking results. This is perfect for novel object testing, plus maze studies, social preference tests, and more.

BEHAVIOR RECOGNITION

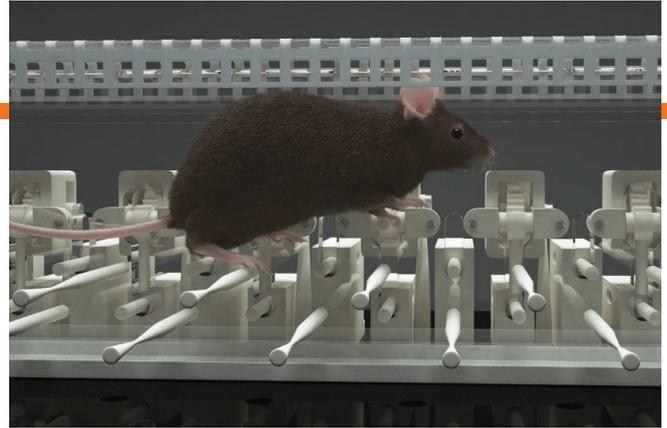
Revolutionize your studies with automatic recognition of rodent behavior. This optional add-on to EthoVision XT is a fast, accurate, and tireless system that allows you to perform 'around the clock' observations. We have two options available: for rats and mice. Both recognize ten behaviors, such as grooming, jumping, hopping, twitching, sniffing, and rearing. Behavior recognition is based on several factors, such as the location and movement of specific body points, and body contour shape. Motion statistics, intensity, and periodicity are also taken into account. Consultancy services are available for custom parameters.



ErasmusLadder

- *Assess motor learning and performance in mice*
- *Non-invasive, automated, reliable method*
- *Designed to test cerebellar functioning*
- *Validated in scientific publications*

The ErasmusLadder® is a fully automated system that tests and challenges motor performance and motor learning abilities in mice. It is a unique, non-invasive, and easy-to-use method to effectively screen for cerebellar behavioral phenotypes. The ErasmusLadder is a horizontal ladder in between two goal boxes. It has touch-sensitive rungs to measure the stepping behavior. Over several sessions, motor performance and learning



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is assessed. In the second phase, mice can be challenged with a precisely timed obstacle paradigm: a rung is raised above stepping level and announced by a tone. How the mouse reacts indicates how good its reflexive motor learning abilities are.

CatWalk XT

- *Quantification of footprints and gait in rodents*
- *Real footprints and body weight distribution*
- *Plug-and-play high-throughput method*
- *Validated for many disease models*

CatWalk™ XT is a highly sensitive tool for the assessment of gait and locomotion in rodents. While the animal traverses a glass plate, Illuminated Footprints Technology captures the actual footprints with a high-speed video camera for maximum spatial and temporal resolution. The movement of the animals is unforced, giving you the most realistic picture of their gait. The software visualizes the prints and calculates statistics related



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to the print dimensions and the time and distance relationships between footfalls. This method has been validated in disease models such as Parkinson's, spinal cord injury, neuropathic pain, and cerebellar ataxia.

DanioVision

- *Zebrafish larvae activity monitoring*
- *High-throughput research*
- *Controlled plug-and-play environment*
- *Powered by EthoVision XT*

DanioVision™ is an innovative system for high-throughput testing of zebrafish larvae or other very small animals. The Observation Chamber provides a controlled testing environment that holds any standard multi-well plate or other small container (such as a petri dish). It also contains a high speed digital camera, and the basin is backlit with an IR-light for tracking and an adjustable white light that can be used for



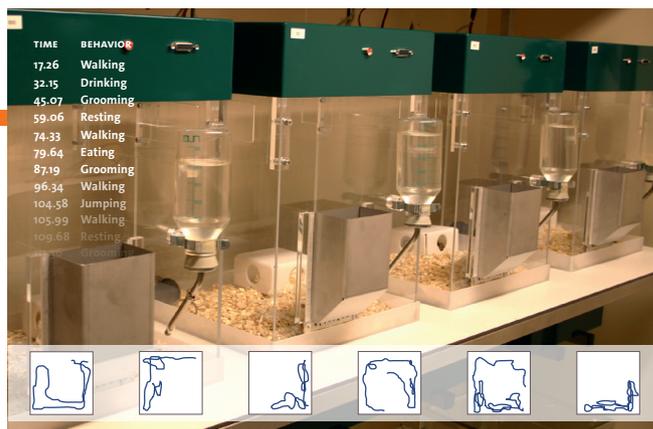
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day/night rhythmicity or to evoke a startle response. The Temperature Control Unit eliminates the need for climatized rooms. Add the Tapping Device, Toplight Unit, or Optogenetics Add-on to complete your setup!

PhenoTyper

- *Home cage testing environment*
- *Instrumented with camera and LED*
- *Suitable for optogenetics and operant conditioning*
- *Special add-ons available*

PhenoTyper® is a flexible instrumented home cage (available in two sizes) to measure the behavior of laboratory rodents in both short-term and long-term studies. Tracking is possible independent of environmental light. PhenoTyper can easily be equipped for a test using optogenetics or an operant conditioning setup. Special add-ons for home cage assessment include the Activity Wheel for rats, the PhenoWheel for mice, the



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Pellet Dispenser that releases food based on timing or behavior, the Lickometer to measure drinking behavior, and the Mouse Feeding Monitor to measure feeding duration and frequency in mice. PhenoTyper is powered by EthoVision XT.



WWW.NOLDUS.COM/OBSERVER-ANIMAL

The Observer XT

- *Score behavior in detail*
- *Integration platform*
- *Manage your data*
- *On-the-go options*

The Observer® XT is professional and user-friendly event logging software for the collection, analysis, and presentation of observational data. It supports the entire workflow of a research project, from ethogram to presentation of the results. You can integrate external (physiological) data streams in your visualization and analysis. With several add-ons, you can adapt this tool to your research needs. Need to score on-the-go? Pocket Observer works on a range of handhelds and smartphones. Or share your work with Coder Licenses.

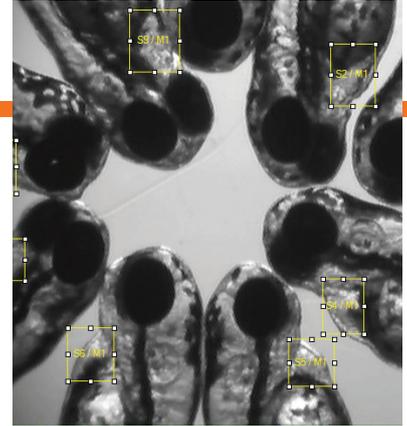


WWW.NOLDUS.COM/ULTRAVOX

UltraVox XT

- *Ultrasonic vocalizations*
- *Full spectrum sound capture*
- *Compact & cost effective*
- *Easy labelling of calls*

UltraVox™ XT is a software tool that analyzes rodent ultrasonic vocalizations. The signal is displayed in real-time in a waveform and spectrogram. Define frequency range, amplitude, duration, and time gaps to let UltraVox XT find all calls that fit those criteria, then easily label each call with user-defined names. UltraVox XT provides a PDF report with data, statistics, and spectrograms. It also plays back the recording in an audible range. You can export data, audio files, and images. Fully compatible with EthoVision XT and The Observer XT data.



WWW.NOLDUS.COM/DANIOSCOPE

DanioScope

- *Video analysis tool*
- *Zebrafish embryos & larvae*
- *All-in-one tool*
- *Non-invasive*

DanioScope™ is a non-invasive video-based software tool that allows you to keep track of zebrafish embryo and larva parameters. Embryos are automatically detected and their activity (tail coiling, convulsions) is automatically measured. You can measure the heartbeat of all your subjects in the video by simply defining the heart areas. Blood flow and gut flow activity can be measured by indicating a circular area of interest, such as the diameter of a vein. Last but not least, still images can be used to measure morphological parameters such as eye size and body length.