Innovative solutions for zebrafish research

Make your research more efficient, accurate and reproducible with top-of-the-line tracking software, fully integrated labs and scientific advisers.

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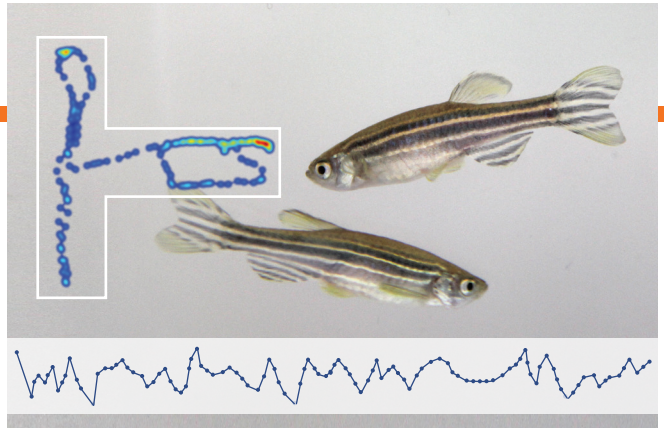
Noldus
Information Technology

EthoVision XT

- *Reliable tracking of any fish species*
- *Increases accuracy & reproducibility*
- *The most used video tracking software*



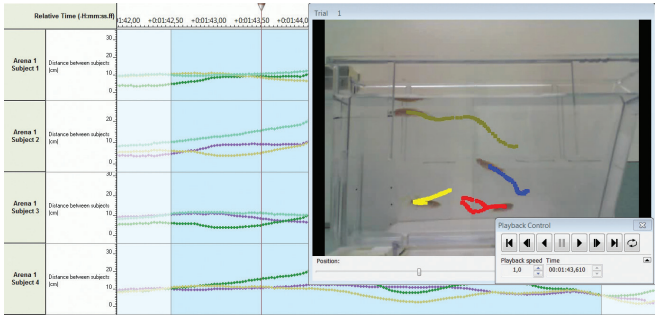
NOLDUS.COM/ETHOVISION-XT

WHY SCIENTISTS USE ETHOVISION XT

Behavioral researchers are tasked with reducing animal numbers, saving costs and increasing the robustness of their tests. Having the right tool for the job is key in unlocking the most out of your limited resources.

EthoVision® XT is the best system for tracking fish behavior and movement. With the special algorithm you can combine multiple body point detection with swimming patterns and paths. This allows you to create a robust dataset that works seamlessly with the built-in analysis tools. You can also create great visuals that can be exported straight to your soon to be published paper.

With EthoVision XT obtaining, analyzing and presenting data has never been easier. That is why thousands of researchers have used and published with EthoVision XT for more than 30 years.



A FLEXIBLE PLATFORM CATERED TO ALL NEEDS

Sometimes research requires more than just a video tracker. That is where the flexibility of EthoVision XT comes into play. Incorporate the control of lights, audio, optogenetics, a tapping device or special 3D tracking. You can even 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.

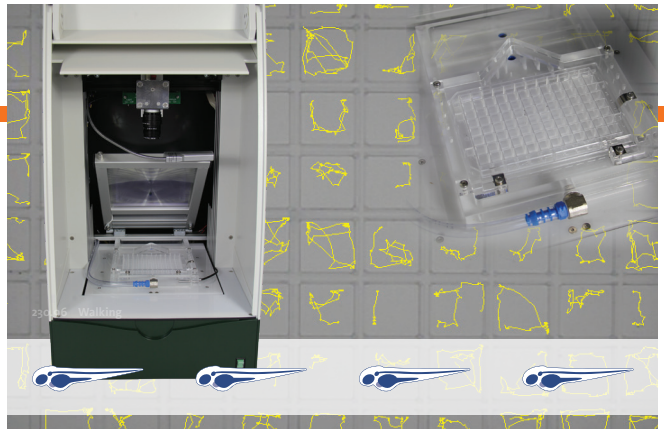
> *I can get all this behavioral data easily by a click of a button, and basically analyze and look at behaviors I couldn't do on my own.*
>
> STEPHANIE SHISHIS | GERLAI ZEBRAFISH LAB, CANADA

A GOOD START IS KEY

Are you a novice and need some help along the way? EthoVision XT has built-in video tutorials, right where you need them. More experienced users love the quick set-up options, templates, and advanced creating of custom parameters. We also have trained PhD experts that can help you with your research from conception to execution.

DanioVision

- *High-throughput system*
- *Standardized measurements*
- *Empowered by EthoVision XT*



NOLDUS.COM/DANIOVISION

POWERFUL ANALYSIS OF LARVAL BEHAVIOR

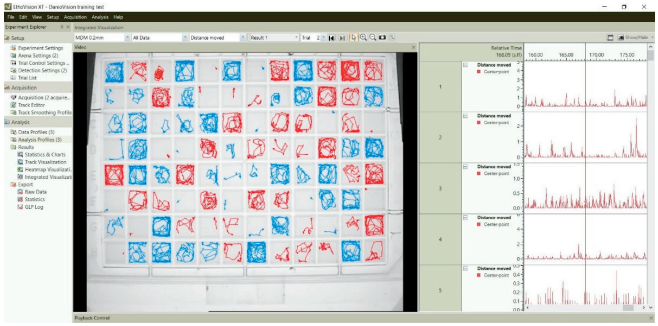
Researchers that study the behavior of zebrafish larvae often use large sample sizes and therefore need a high-throughput system. DanioVision™ is a controlled environment that enables you to measure larval activity in a variety of multi-well plates.

With DanioVision you can measure parameters like stereotypic and epileptic behaviors, circadian rhythmicity, motor control, movement disorders, neural development, and more.

When observing behaviors, a controlled standardized environment gives you the highest quality data. With DanioVision you will have more reliable and reproducible results, and your entire workflow is programmable with EthoVision XT.

SEAMLESS LONG-TERM RECORDING

Sometimes researchers require to study the development or long-term effects of certain interventions. Luckily, DanioVision is the ideal environment for recording zebrafish larvae around the clock.



An infrared backlight allows you to observe the larvae during the night without disturbing their behavior. Furthermore, with the temperature control unit you can precisely control environmental conditions in DanioVision to best suit your research. Everything in DanioVision can be programmed by EthoVision. From the day-night cycle to light flashes or taps for an induced startle response and much more. This means that all of EthoVisions ease of use, robustness, and adaptability instantly transvers to DanioVision.

> *DanioVision allows an easy solution to monitor and quantify physical activity and swimming behavior in a large number of larvae simultaneously.*
>
> DR. M. DEN HOED | UPPSALA UNIVERSITY, SWEDEN

APPLICATIONS OF DANIOVISION

DanioVision has been used for many research applications over the years. As the ideal system for studying zebrafish larvae and other small organisms it has been used in:

- Neuroscience research to assess behaviors related to epilepsy research
- Drug screening and toxicology to evaluate the influence of compounds on development and behavior
- Circadian rhythm research by stimulating day/night cycles

The Observer XT

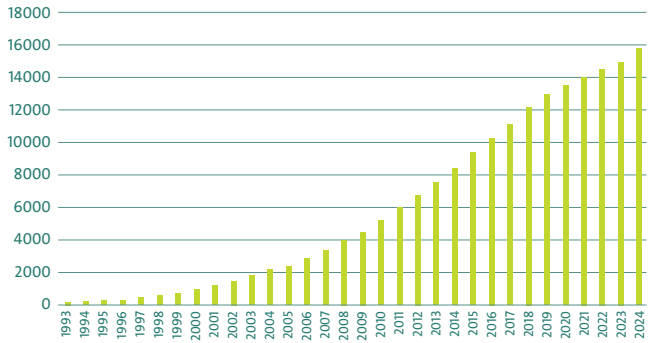
- *Make scoring behaviors detailed and quick*
- *Integrate multiple data streams*
- *Streamline your entire workflow*

HIGH POWER EVENT LOGGING

Some studies require a more detailed look at behavior than just movement patterns. This is where manual observation can provide a more tailored solution. However, this can be a laborious process, but The Observer® XT is here to help streamline that process. This user-friendly event logging software helps to collect, analyze, and present your data.

The Observer XT supports the entire workflow of a research project, from ethogram to results presentation. You can score live, from a single video, from multiple camera angles at once, and even on the go with Pocket Observer on your smartphone. Coding can be carried out continuously, or using instantaneous sampling, or a combination while easily being able to share the work with coding licenses.

CUMULATIVE NUMBER OF PUBLICATIONS



NOLDUS.COM/OBSERVER-XT-ANIMAL

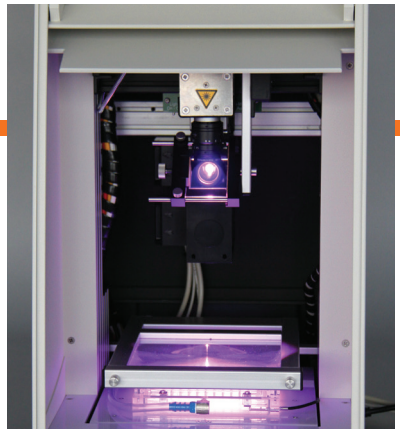
ENRICH YOUR BEHAVIORAL RESEARCH

When you are using The Observer XT there are multiple ways to supplement your behavioral observation data. You can upload other data streams (environmental, physiological etc.) into The Observer XT, allowing you to research patterns that cannot easily be found through manual means. Furthermore, the software offers descriptive statistics of the coded behavior. You can calculate frequency and duration of behaviors, statistics for numerical modifiers or numerical external data, which can all be exported if needed. Also, you can perform a reliability analysis between different observers.

> *I would buy The Observer software again. It saved me months of time.*
>
> DR. ELIZABETH EADIE | UNIVERSITY OF MEXICO, USA

HIGH PUBLICATION POWER

Clear visualizations, analysis and its establishment in the field of behavioral science, have been proven to enable you and countless researchers before you to publish in the highest impact journals.



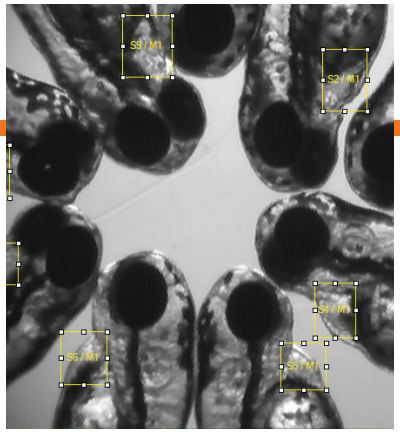
NOLDUS.COM/DANIOVISION/ADD-ONS

Optogenetics

- *Stimulate specific neurons*
- *2 wavelengths (LED)*
- *Correlate with behavior*

With optogenetics you can activate certain neurons in the brain. In rodents this requires an invasive optic fiber to be inserted into the brain. There is no need for such an operation when performing optogenetics with zebrafish larvae. Because of their transparency, an LED light can be directly applied to specific neurons.

With EthoVision XT and DanioVision you can easily correlate the activation of neurons with observed behaviors. This combination also allows you to program and execute your experiment with the click of a button.



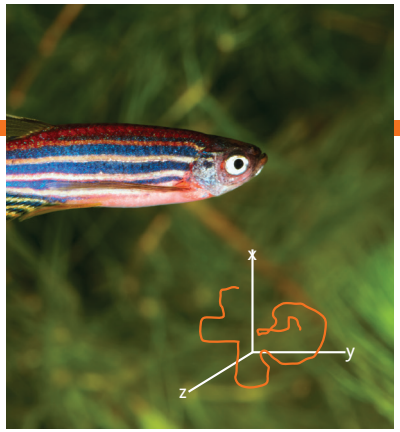
NOLDUS.COM/DANIOSCOPE

DanioScope

- *Non-invasive measurements*
- *Batch video analysis*
- *Combine types of data*

Zebrafish larvae and embryos are often used to test the effects of toxins or other substances on behavior and physiology. DanioScope™ is a non-invasive video-based software tool that allows you to keep track of zebrafish embryo and larvae beha-vioral and morphological parameters.

With DanioScope you can detect embryo activity, cardiology, and blood and gut flow. With the click of a button the embryos are automatically detected, and you can start measuring. Furthermore, multiple morphological measurements like tail length, eye size and pericardial area can be measured from calibrated images.



NOLDUS.COM/ETHOVISION-XT/MODULES

Track3D

- *Track in the 3rd dimension*
- *EthoVision XT module*
- *Easily and accurately calibrated*

In zebrafish research, subtle behavioral changes often occur in the vertical plane, something traditional 2D tracking can miss. With Track3D you can capture the full 3D swim patterns of your fish during a test. This reveals nuanced behaviors like diving, erratic movement and zone preference.

Custom calibration ensures accurate data for your setup. Once calibrated, Track3D allows you to measure metrics such as swim speed, mobility, angular changes, and time spent at depth. Since Track3D is a module, you get all the benefits of EthoVision XT.

Your partner in research

- *Around the clock support*
- *Advice from a team of scientific experts*
- *Maximized investment with NoldusCare*

Our trainers are experts with advanced degrees in behavioral sciences. They can help transform your setup and data into meaningful insights and provide technical solutions for your research questions. This allows you to focus on the results and save time. Recently, we released the NoldusAcademy, the place where our experts guide you through our portfolio of innovative solutions for measuring behavior. From informative videos, on the why's and how's of behavioral research to

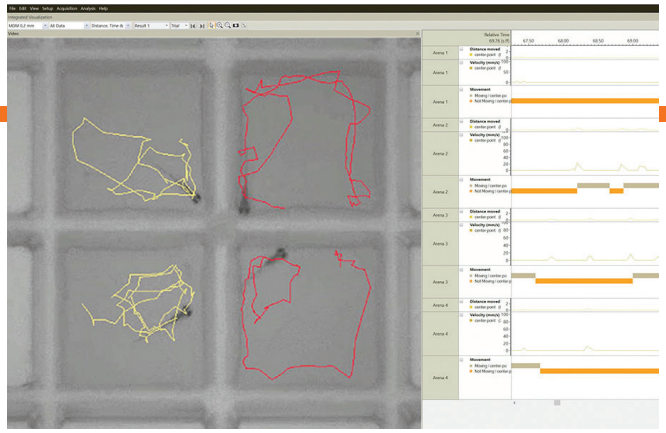
NOLDUS.COM/SERVICES

full on courses that teach you the ins and outs of products like EthoVision XT and the Observer XT. These resources are a great starting point for beginner researchers and veterans alike.

Get the most of your setup

- *Change lighting intensity and color*
- *Induce startle with tapping device*
- *Study anxiety with a light-dark grid*

With some tests you might require your zebrafish setup to do more specialized tasks. You can expand your DanioVision or EthoVision XT package with various add-ons and modules tailored to your research. DanioVision has various hardware expansions that can be used for temperature control, startle responses, optogenetics and anxiety related paradigms. These are easily installed and controlled with the software. Furthermore, you can switch out your well plates at any point to accommodate for the animals



NOLDUS.COM/DANIOVISION

you are currently using. With EthoVision XT, you can expand your setup to track multiple fish at once and track them in the third dimension with Track3D.