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# SETTING UP A SUCCESSFUL LAB



This is a preview chapter of our e-book: 'A Buyer's Guide to the Perfect Video Tracking Setup'

*A publication by Noldus Information Technology*



Meet the researcher

## DR. ALICIA BRANTLEY

Dr. Alicia Brantley has more than 20 years of behavioral research experience in designing and validating behavioral assays for various rodent species. With all this weight under her belt, it is no surprise that she is the Scientific Director of a well-established Mouse Behavior Core at UF Scripps Biomedical Research in Jupiter, Florida.

*"I first started setting up the novel object test the year I set up our core (2010). Although I did not expect to encounter issues, the actual experiment basically showed no preference towards the objects. I wanted to figure out what was going on and why many other people were having issues replicating results in the novel object test."*

Dr. Brantley provides her expertises to cater researchers with insight, training, access, and support to better understand the neurobiology of behavior, and to develop improved methods for quantitative, replicable, assessment of behaviors.

*"I figured out why these tests are so difficult to replicate, one part lies in the (detailed) reporting of the methods. But we can have a better chance of replicating results, if we utilize the available technology which is constantly evolving, such as deep learning tracking technology and automation."*



## START SIMPLE AND SIMPLIFY THINGS

Automated tracking systems provide recognizable, reproducible results, saving time and resources by providing flexibility and robustness: One platform to track them all. So where do we start? Well, it is always recommended to start simple:

- A camera
- A computer
- Video tracking software
- An apparatus of choice
- And of course, your model animal.

Before we dive into options, however, let's start with a large assumption. By that, we mean that it is generally assumed that you use rodents in your research; if that's not the case, do not despair. We've still got you covered! Tracking systems do not discriminate against the species used. For example, EthoVision XT has been used to track fleas, ticks, bed bugs, cockroaches, scorpions, snails, snakes, fish, whales, dogs, cats, pigs, voles, hamsters, mice, rats, macaques, rhesus monkeys, and children.

Simplifying things further, most systems work with pre-existing videos or with a camera for live recording. Finally, EthoVision XT has always allowed for offline analysis, without the license key: You shouldn't have to gown up and go into the barrier to analyze data! Take your project anywhere for analysis.

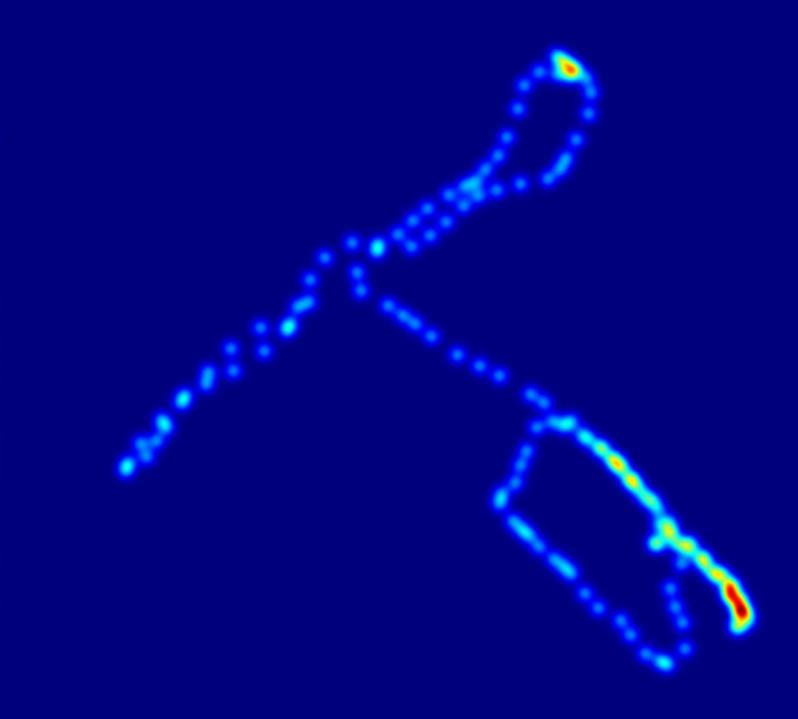


**Remember:** When you want to add to your research and when it comes time to publish: You want reliable and validated systems.

If you haven't gathered by now, flexibility is the name of the game! Unfortunately for many of us, this wasn't always the case.

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Visualizations like heatmaps and path overlays allow for visual representations of paths in action



## LEARNING TO MAKE SMART DECISIONS

The early days of tracking systems were arduous. Analog cameras recorded to tape, not computers. Automation was in its infancy and, putting it mildly, detection was difficult. Many open fields relied on beam breaks and most maze tasks were either hand-scored or traced, using transparencies and markers! Since then, tracking systems have developed many advanced features like deep learning via artificial neural networks, integration with external hardware through Arduino, Raspberry Pi, or TTL (Time-to-live), and the ability to write your own JavaScript variables directly in the software. In addition, visualizations like heatmaps and path overlays allow for visual representations of paths in action.

Modular approaches like those found in EthoVision XT or MazeScan provide flexible options to fit any budget, and free customer support from Noldus or Stoelting provides a helping hand when things don't go according to plan. Although some companies offer free support, they do not guarantee a response within one business day as Noldus does. Many open source tools, such as DeepLabCut, require forums and the user community for help. Support and service cannot be overstated and is a necessary component to any successful lab!



*"I think the support staff is exceptional. They are very available and knowledgeable and make the difference between a complex, expensive software program that sits on your shelf in a box, and one that is an integral part of your research methodology."*

Alberta Pos, York University, Toronto, Canada

## GETTING YOUR DATA AND PUBLISHING YOUR RESULTS

Platforms like EthoVision XT and ANY-maze are prominently featured in high-impact neuroscience journals. Open source tools, such as DeepLabCut, continue to grow in popularity. When you publish your findings, you can be confident that a reviewer will accept your findings from these established systems. Creating your own platform, although cost effective, may cost time as you seek to validate your findings and justify its use to external reviewers. In addition, unlike other tracking systems, EthoVision XT allows access to your raw data for more detailed analysis in R or MATLAB.

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Let's face it, you're a brilliant scientist. But who has time for a steep learning curve when working with any new system? No one. Fortunately, improvements in most systems have made

it easier for novel users to collect data; however, sometimes you need help from an expert, especially when your system requires lots of integration or hardware.



For example, Noldus' Tech Support North America covers the entirety of North America, from Seattle to Miami and from Vancouver to Halifax. In North America, Noldus has five tech support gurus, three of which have PhD's in biology or neuroscience, because let's be honest, things happen. When trouble arises, you want to know you're covered.

### noldus support offices

No one has time to waste waiting on a single technician or reading Github forums! Noldus takes it one step further, EthoVision XT comes with:

- An **application manual**, which describes a step-by-step guide for most of the standard behavioral tasks, and
- A **90 minute video tutorial** that guides new users through-out the process. This tutorial is embedded into the software, ensuring your success. Remember, when you get stuck, don't hesitate to reach out to our support team!

It's not always possible to know that you've made the right decision before purchasing. But rest assured knowing that you will have no buyer's remorse with EthoVision XT. You will be able to collect data immediately, with no programming required. Automated features make detection as easy as using your computer mouse to draw a box around your real mouse! A powerful workstation ensures that your system will run correctly and save all your videos.

All things taken together, using video tracking technology from a trustworthy partner you'll be empowered to get your data and publish your results. On the next page, meet the companies that are commonplace names in the behavioral neuroscience community.

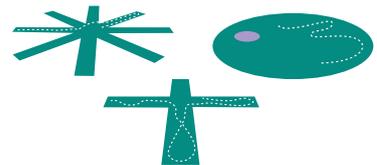


saving  
time  
with ethovision xt



experiment templates

EthoVision XT provides predefined templates for common mazes and tests.

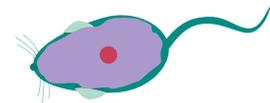


When setting up your experiment, answer questions (number of subjects; maze type) and let EthoVision XT adjust all the basic settings for you!



automated detection  
settings

With five models and four detection methods, EthoVision XT is suitable for a wide range of lab settings.

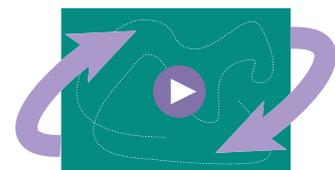


Let EthoVision XT automatically suggest your optimal settings and detect your subject - a real time-saver!



batch acquisition

Have pre-recorded videos you need to run back-to-back?



Batch acquisition means you can acquire a series of trials at one push of a button. Line up all of your video files and let EthoVision XT do the rest!

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## MEET THE COMPANIES BEHIND THE SOFTWARE

Established companies, such as Noldus, Stoelting, and Clever Sys., are commonplace names within the behavioral neuroscience community.

### 1989

Noldus was founded in 1989 by Lucas Noldus. With a PhD in animal behavior from Wageningen University, he developed the company's first software tool during his research in entomology.

### 1996

Noldus' North American headquarters were established in 1996. Since then, the US office has grown to 30 employees, of whom 16 have either a Masters or PhD. Many current and former employees had direct experience with Noldus' solutions prior to joining the company.

### 1999

In 1999, Noldus attended its first Society for Neuroscience conference in Miami, Florida and has been at every subsequent meeting since.

### 2005

Finally, Noldus opened its current world-wide headquarters in 2005 in Wageningen, NL, in the very field in which Lucas did his dissertation studies!

### 2022

Today our building houses three beehives, a green roof with biodiverse vegetation covering and 122 solar panels. Noldus is a company of scientists devoted to science. We succeed when you succeed.

**NOLDUS' GREEN ROOF**

## applying for grants and promoting research outcomes

Did you know that Noldus offers grant assistance? We can provide guidance on developing behavioral protocols, performing behavioral tasks, or making the most out of your Noldus platform. We also partner with our researchers to promote their research, via white papers, blogs, and webinars. In addition, we offer flexible options for support and upgrades. Just saying that we aim to be a partner moving science forward.



*"EthoVision XT has dramatically improved my ability to incorporate extensive behavioral testing with one group of animals. It reduces the time needed to record and analyze behaviors while allowing for much more extensive analysis of behavior."*

Dr. M. Hyer - Virginia Commonwealth Univ., Richmond, USA

**Want to read this entire e-book?**



*"I am fascinated by new technologies to measure brain, body and behavior. Building high-quality research tools that allow our customers to advance science, thus contributing to sustainable development and quality of life, fills me with pride. And doing this with a global team of professionals is a daily source of joy!"*

Prof. Dr. Lucas Noldus, founder of Noldus Information Technology by