

Noldus
Information Technology

*Tracking consumer in food environments
with the TrackLab technology*



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Noldus Contents

- *Who we are*
- *Technique for Tracking consumer in food environments*
 - Tracking consumer in Virtual supermarket
 - Tracking consumer in Buffet, Restaurant, Supermarket

Noldus Who we are

- Developer of professional software, hardware and integrated solutions for behavior research
- Provide solutions for stationary, mobile and portable laboratories
- Established: November 1989
- 100 employees worldwide
- Global headquarters in Wageningen, The Netherlands
- American headquarters in Leesburg, VA, USA
- Regional offices in France, Germany, Spain, Hungary, USA, China
- > 6.500 customers in 75 countries



Noldus in The Netherlands



Noldus Universities

Customers

- > 1500 research groups
- > 75 countries, on all continents
- Seven out of the world top 10 universities
- Five out of eight in the Ivy League

References
Hundreds of publications since 1988

Areas
Psychology, consumer behavior research, medicine, animal behavior research, human factors, linguistics, sensory science, sports.....

Noldus Clients

Over 500 companies use Noldus products
A small selection:

Noldus Clients

Users in china in 2014 : > 500

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Noldus Topics related

- *Choice architecture – food present*
design of different ways in which choices can be presented to consumers, and the impact of that presentation on consumer decision-making
- *Smart buffet -accurate nutritional value*
- *Simulating food environments*

Noldus **Simulate Food Choice in Shop**

The collage consists of three main images. The top left shows a person in a red shirt pushing a shopping cart in a real grocery store aisle. The top right shows a person in a blue top interacting with a large, curved digital display that simulates a grocery store aisle. The bottom left shows a computer screen displaying a virtual grocery store interface with various product images and a shopping list. The bottom right shows a close-up of a computer keyboard and mouse.

Noldus **Simulate Food Choice in Shop**

The collage consists of two main images. The top image shows a wide-angle view of a virtual grocery store aisle with various product displays and signage. The bottom image shows a close-up view of a product display on a virtual shelf.

Noldus **Technology - Virtual Shop**

Integrated system for studying consumer behavior

To provide a solution that can:

- Automate data collection as much as possible
- Support data collection without expert knowledge
- Be flexible and extendible (add/remove components)
- Ensure synchronization of all data

Noldus **Technology - Virtual Shop**

- Easy to use
- 3D remote eyetracking
 - Tracking all parts of the simulator
 - With static and dynamic object detection
- Integrated system
 - All data in one system (simulator parameters, eyetracking data, behaviors)
- Realistic shopping environment
- Enhanced analysis options
- Open platform

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INTEGRATED TECHNOLOGY

Virtual Shop: components

Partnering between domain specialists


- Shop Simulator
 - Realistic environment
- SmartEye Eyetracker
 - Remote
 - 3D
- The Observer XT
 - Data integration
 - Analysis
- N-Link
- Optional
 - Physiology
 - FaceReader

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Shop Simulator

Green Diana

- Design shop scenario and layout
- Chang package design
- Consumer movement
- Select food and read label
- Consumer Food choice



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Eye Tracker

SmartEye

- Remote tracking
- Head & eye tracking
- 3D

Data

- Areas of Interest
- Fixations
 - Static
 - Dynamic
- Pupil dilation
- Blinks
- Etc.





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INTEGRATED TECHNOLOGY


FaceReader

Classification of the basic emotions


- Happy
- Sad
- Angry
- Surprised
- Disgusted
- Scared
- Contempt
- Plus a 'neutral' state


Noldus *Physiological Signals*




GSR – Galvanic skin response



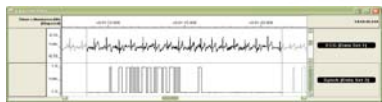
Pulse rate



Skin temperature



EMG – Muscle tension



ECG – Cardiac activity, heart rate

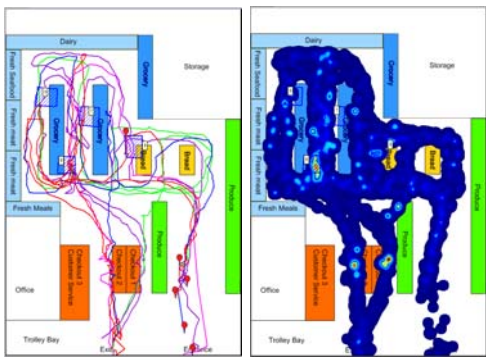
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Noldus **Tracking Consumers in Restaurant**



Noldus **Tracking Consumers in Supermarket**




Noldus
TrackLab

Flexible, easy to use software for **recognition and analysis** of spatial behavior and the design of **interactive systems**.

- Collect tracking data real-time or offline
- Visualize data
- User defined regions of interest and classifiers
- Generate real-time feedback
- Analyze collected data

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Why use TrackLab?

- **Flexible:** You select how to collect the data and what to analyze.
- **Complete:** Every step in one tool, from collection to analysis of data.
- **Integrated solution:** Fully integrated solutions for every type of research, including software, hardware, installation and training.
- **Interactive:** Send out real-time events for integration with other solutions.
- **Efficient:** One tool for multiple studies/projects.



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Collecting data Techniques

Systems for real-time and offline collection of tracking data:

- GPS
- **Ultra Wide Band**
- Stereo camera sensors
- PeopleTracker
- WiFi
- Etc.



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Collecting data Techniques

Ultra WideBand tracking

- Tag based
- Accurate
- Reliable
- Easy to use



Noldus *Observational Technology*

Analyzing data

Relevant statistics for analysis of location and movement:

- Distance and time (distance moved, speed).
What medical specialist moved most?
What is the average speed of specialists?
- Location (time in zone, distance to point).
What area is visited most by different individuals?
- Path shape (heading, turn angle, meander).
Do specialist move directly to patients?
- For complete tracks or per zone or interval?
Is the average speed higher near the patient?
During what period of the operation occurs most movement?

Noldus *Observational Technology*

What is TrackLab?

Analyzing data

Noldus *Observational Technology*

Observational research – Restaurant of the Future

Noldus *Observational Technology*

Food Experience Simulator (under development)

Food stimuli are presented on a computer screen (A) or on a plate (B), and/or via oral or nasal catheters (C) connected to computer-controlled of gustatory stimulus generators (D). An observation unit (E) contains infrared illuminators and a video camera to record facial expression and pupil dilation, as well as depth sensors to record body posture changes and hand gestures. The subject wears a flexible cap with EEG and NIRS sensors (F), whilst heart rate and GSR are measured by sensors on the hand (G). The experiment is controlled by an operator from a remote computer console. All stimulus and response data are synchronized and logged in a central database for offline integrated analysis.

Drawing by Faenzi

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