

Noldus

Information Technology

A decorative graphic consisting of several overlapping, hand-drawn style circles in various colors (orange, yellow, green, purple, blue) scattered across a horizontal bar with a color gradient from orange to blue. The background below the bar is dark green.

Innovative Solutions for Observational Research

The Observer XT, FaceReader and more...

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Overview Tools

- The Observer
- Pocket Observer
- FaceReader
- uLog
- Theme
- Matman
- Portable and stationary observational labs
- Instrumented measurement environments for behavioral studies (laboratory, home, supermarket, restaurant, airplane...)

The Observer[®]

The Observer XT - Discussion

File Edit View Setup Observe Select Visualize Analyze Export Window Help

Type a question for

Explorer

- Discussion
 - Setup
 - Coding scheme
 - Independent Variables
 - Default observation settings
 - Observations
 - Boss-employee
 - Observation settings
 - Event files
 - Media files
 - External data
 - Data profiles
 - Default Data Profile
 - Analysis settings
 - Export settings

Playback Control

Observation Control

Timer	h:m:s:msec
Start	12:07:50.000000
Current	12:07:54.609016
Stop	12:08:10.116663
Observed	00:00:20.116663
Elapsed	00:00:04.609016
Maximum	00:01:13.333333
Remaining	00:00:15.507647

Boss-employee - Event Log

	Event Time	Subject	Behavior	Comment
1	12:07:52.224	Boss	Looking at	
2	12:07:52.224	Employee	Talking	I would like to ask you something
3	12:08:10.116	Boss	Leaning back	
4	12:08:10.116	Boss	Together	
5	12:08:10.116	Employee	Humming	
6	12:08:10.116	Employee	Humming	
7	12:08:10.000	Employee	Talking	Well, I was wondering
8	12:08:10.116	Boss	Upright	
9	12:08:10.126	Boss	Talking	Yes?
10	12:08:10.116	Boss	Together	
11	12:08:10.116	Boss	Looking at	
12	12:08:10.116	Employee	Looking at	
13	12:08:10.116	Employee	Speech	
14	12:08:10.116	Employee	Talking	We have this supplier mr. Smith
15	12:08:10.116	Boss	Looking at	
16	12:08:10.116	Boss	Leaning back	
17	12:08:10.116	Boss	Upright	
18	12:08:10.116	Boss	Together	
19	12:08:10.116	Employee	Looking at	

Boss.mpg

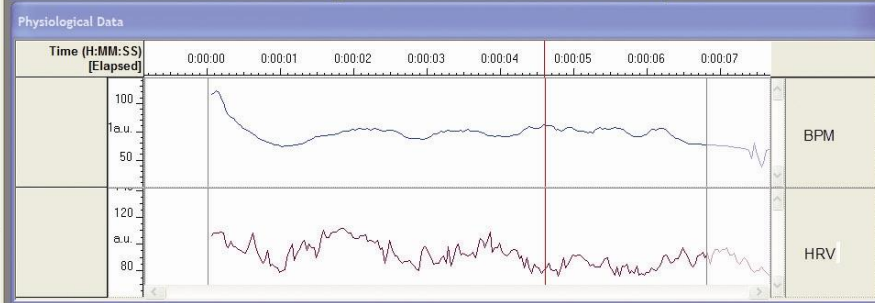
Position: Elapsed Time: 0:00:08.120

Employee.mpg

Position: Elapsed Time: 0:00:04.600

View settings

	Sh...	Set
SubjectS	<input type="checkbox"/>	<input type="checkbox"/>
Behaviors	<input type="checkbox"/>	<input type="checkbox"/>
ModifierS	<input type="checkbox"/>	<input type="checkbox"/>
Codes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Event Log	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Video Files	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
External Data	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Codes

Subjects	Behaviors	Modifiers	Status	Start	Stop
Speech	Talking	Boss	s	t	
	Humming		h		
	Gaze		g		
	Looking at		l		
	Looking away		k		
	Posture		p		
	Upright		u		
	Leaning back		e		
	Leaning forward		n		
	Gesture		r		
	Together		b		

Existing observation, you can edit events or press 'Start Observation' to score additional events

Method: systematic observation

Recording **who** does **what**, **where**,
when and **with whom**

- **Who:** Subject (1..n)
- **What:** Behavior (individual, interaction)
- **When:** Time stamp (recorded automatically)
- **Where:** Modifier (specifies behavior more accurately)
- **With whom:** Modifier (specifies behavior more accurately)

Tool: The Observer[®]

The Observer XT - Trein Rangen

File Edit View Setup Observe Select Visualize Analyze Export Window Help

Type a question for help

Observation0001 - Event log0001

	Event Time	Subject	Behavior	Behavior Modifier	Comment
Start	+00.000				
1	+00.000	Data collector	Starting measurement		
2	+00.983	Shunter	Ducking	With support	
3	+05.667	Shunter	Ducking	With support	
4	+05.667	Shunter	Ducking	With support	
5	+08.024	Shunter	Ducking	With support	
6	+08.025	Shunter	Connecting	Hook	
7	+09.920	Shunter	Connecting	Hook	

Status: Review Mode

Playback Control

Not recording

Playback speed: 1,0 Time: 00:00:07.900

Step frame forward (Ctrl+Right)

Visualize Data

Time (H:mm:ss.DD) [Actual]

8:35:40.000 8:35:50.000 8:36:00.000 8:36:10.000

2000

0

Compress...

Codes

Subjects Behaviors Modifiers

Subject	Status	Start
Data collector		s
Shunter	Ducking	t

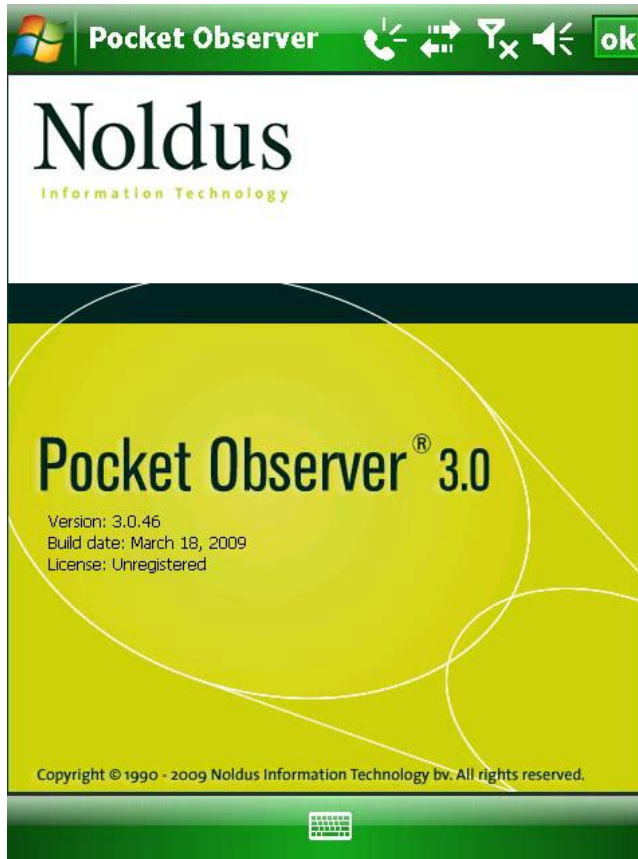
Position: Elapsed Time: 0:00:07.880

Dialog

Dialing

NUM

Pocket Observer[®]



The Observer XT 8.0 - Chat application XT80 - [Testing Skype - Event log0001]

File Edit View Setup Observe Analyze Help

Project Explorer

- Chat application XT80
 - Setup
 - Observation Sources
 - Coding Scheme
 - Independent Variables
 - Observations
 - Testing MSN Messenger
 - Testing Skype**
 - Observation Sources
 - Event Files
 - Event log0001
 - uLog
 - Media Files
 - External Data
 - Analysis
 - Data Profiles
 - Task completion time
 - uLog data
 - Usability issues only
 - Episode Selections
 - Behavior Analysis
 - Task completion time
 - uLog data
 - Usability issues only
 - Numerical Analysis
 - Lag Sequential Analysis
 - Reliability Analysis

Videostreams

Chat application - testing Skype.mpg

Codes

Subjects Behaviors Modifiers

	Status	Start key
Tasks root		
Tasks		Ta
No connection		0
Make connection		1
Colleague lookup	" Subject "	2
Invite colleague		3
Communication		4
Success		+
Failure		-
Usability issues		
Usability issues		Us
Navigation		na
Usability hit		uh
User error		ue
System error		se
Other problem		p
User question		uq
User remark		ur
Logger remark		lr

View Settings

	Show	Set
Codes	<input checked="" type="checkbox"/>	
Event Log	<input type="checkbox"/>	...
Video Files	<input checked="" type="checkbox"/>	
External Data	<input type="checkbox"/>	
Observation Timers	<input type="checkbox"/>	
Playback Control	<input checked="" type="checkbox"/>	
SyncBox	<input type="checkbox"/>	...
File Synchronization	<input type="checkbox"/>	
Plug-in files	<input type="checkbox"/>	

Not Recording

10

1

	Event Time	Behavior	Behavior Modifier	Comment
Start	04/20/2006 17:20:4			
1	04/20/2006 17:20:4	No connection		
3	04/20/2006 17:20:4	Make connection		
5	04/20/2006 17:20:5	Colleague lookup		
7	04/20/2006 17:21:3	Invite colleague		
8	04/20/2006 17:22:3	User remark		nothing happening, strange
9	04/20/2006 17:23:0	User remark		oh, that's handy
10	04/20/2006 17:24:0	User question		any idea how?
11	04/20/2006 17:25:4	User remark		oh, now I see
12	04/20/2006 17:26:0	User remark		strange it starts at 40%
Stop	04/20/2006 17:26:2			

Status: Review Mode

Add Behavior group... Add Behavior

Independent Variable... Scoring Options... Select Observations

Ready

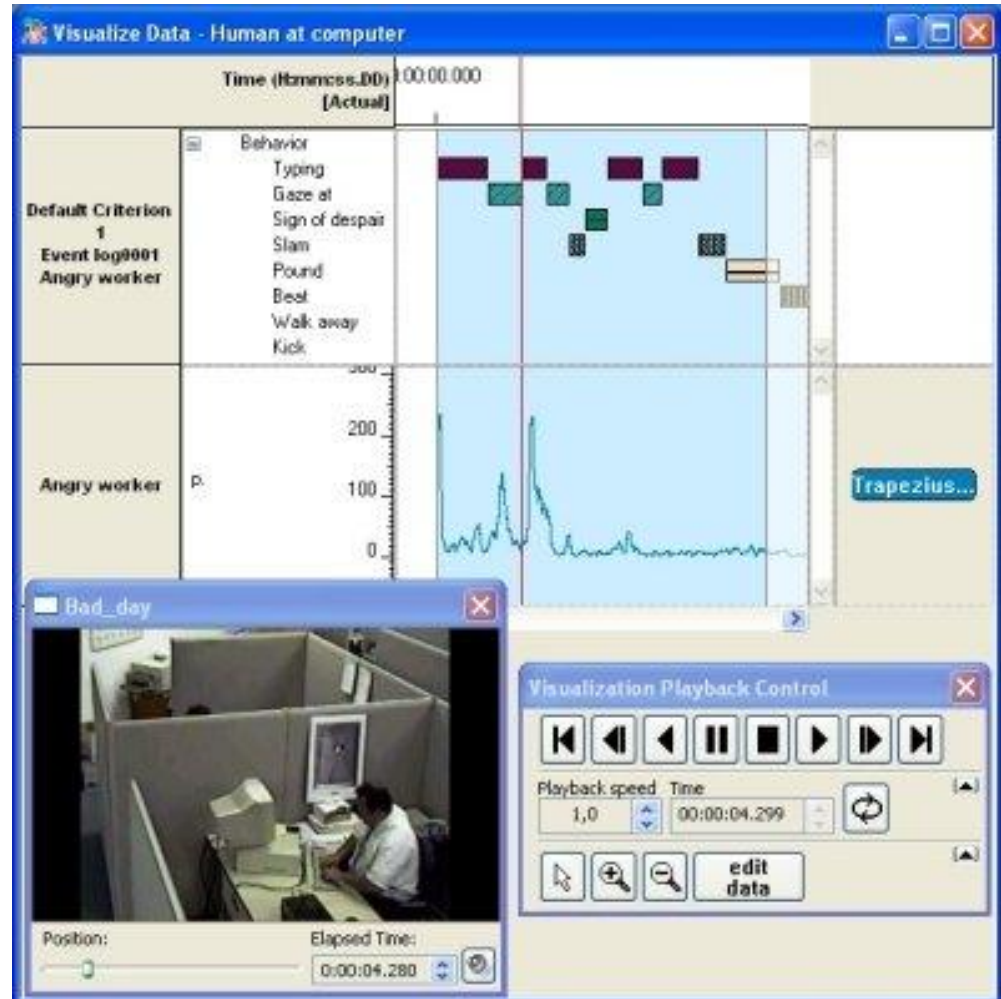
NUM

Synchronized view

- Behavior
- Video
- Physiology

Benefits

- Get a feel for what is going on
- Cross reference between modalities
- Visual quality check & correction



Descriptive statistics

- Which task was the most error prone?

Frequency

- What mobile application is most popular?

Duration

- Which group solves the issue the fastest?

Interval

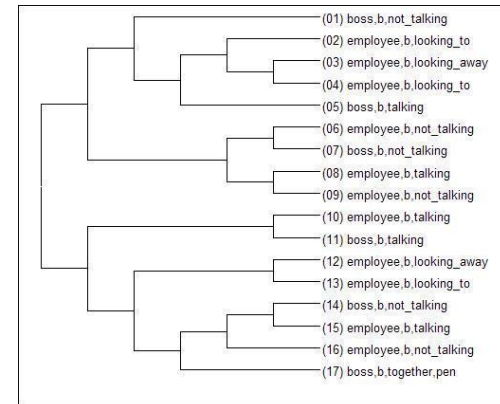
*Customizable layout –
no more tinkering
in Excel!*

	Subjects				
Behaviors		Internet		Games	
Statistics		Total number	Total Duration	Total number	Total Duration
	Derek	4	11	1	3
	Edward	3	30	-	-
	Jerry	-	-	-	-
	Roger	4	45	-	-
	Sean	1	18	-	-
	Justin	2	36	-	-
	Group	-	-	-	-

	Behaviors				
Subjects		Derek		Edward	
Statistics		Total number	Total Duration	Total number	Total Duration
	Internet	4	11	3	30
	Games	1	3	-	-

Social or system interactions & sequences

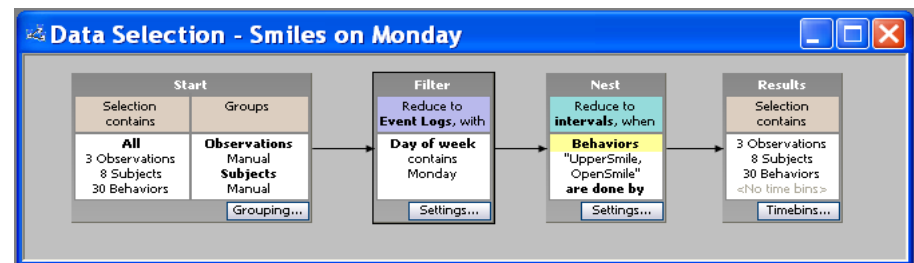
- Synchrony
 - Frequency, duration**
- Interaction matrices
 - Frequency**
- Dominance matrices
 - Frequency**
- Transition matrices
- Matrix analysis
 - MatMan™**
- Time patterns
 - Theme™**



	Music	Phone	Internet	Games	Text Mes
Music	0	1	0	0	0
Phone	1	0	0	0	0
Internet	0	0	0	1	1
Games	0	1	0	0	0
Text message	0	0	1	0	0

Four types of selection

- **Filter** – analyze only part of your data
all boys, only treatment X, only gaze behavior
- **Intervals** – analyze time slices
what happened when mother was out of the room?
- **Group** – join and summarize items
lie down + sleep → inactive
- **Time bins** – chop the results into equal parts
ball possession per minute
- **And/Or** –
combine
criteria



Video highlights

- Show why the design must change
- Show the difference between a social smile and a Duchenne smile
- Export interesting scenes for your conference presentation

Data highlights

- What is the effect of my stimulus on the EEG?
- Which task increases HR the most?

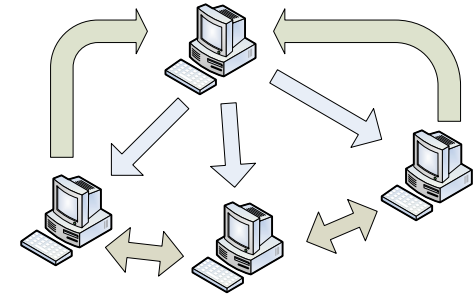


Colleague played a trick?

Use data selection, or select your highlights manually

Exchanging data

- Central project definition & analysis
- Distributed coding
- Share hardware keys



Quality control: reliability analysis

- Record by record comparison
- Confusion matrix
- Cohen's kappa and other statistics
- Batch processing: test all your students at once

Result	Dylan_1 / Selection Result 1	Dylan_2 / Selection Result 1
0	Observation start	0 Observation start
0	Synchronization point	0 Synchronization point
✓ Agreement	0 <Missing Subject> Other	0 <Missing Subject> Other
✓ Agreement	0 <Missing Subject> <Unspecified>	0 <Missing Subject> <Unspecified>
✗ Disagreement	0 <Missing Subject> Null	0 <Missing Subject> Look for
✓ Agreement	1 <Missing Subject> Groom Rosie	1 <Missing Subject> Groom Rosie
✓ Agreement	3 <Missing Subject> Squat	3 <Missing Subject> Squat
✓ Agreement	38 <Missing Subject> Null	38 <Missing Subject> Null
✓ Agreement	39 <Missing Subject> Walk	39 <Missing Subject> Walk
✗ Disagreement	55 <Missing Subject> Bite Alice	55 <Missing Subject> Bite Katie
✓ Agreement	57 <Missing Subject> Climb	57 <Missing Subject> Climb
✓ Agreement	97 <Missing Subject> Squat	97 <Missing Subject> Squat
✓ Agreement	98 <Missing Subject> Eat	98 <Missing Subject> Eat
✓ Agreement	126 <Missing Subject> Null	126 <Missing Subject> Null
✗ Disagreement	131 <Missing Subject> Walk	131 <Missing Subject> Run
✓ Agreement	135 <Missing Subject> Approach R	135 <Missing Subject> Approach R
✓ Agreement	137 <Missing Subject> Run	131 <Missing Subject> Run
✓ Agreement	143 <Missing Subject> Null	143 <Missing Subject> Null

Consistency at all times

- **Data organized in projects – never hunt for files**
- **One coding scheme per project – always consistent data**

Spend time on research, not software handling

- **Independent variables - label and filter your observations**
- **Analyze all relevant data in one go – save an enormous amount of time**
- **Persistent data selection filters – define once, use as often as you need**
- **Archive & access your analysis results**

10 benefits of The Observer XT

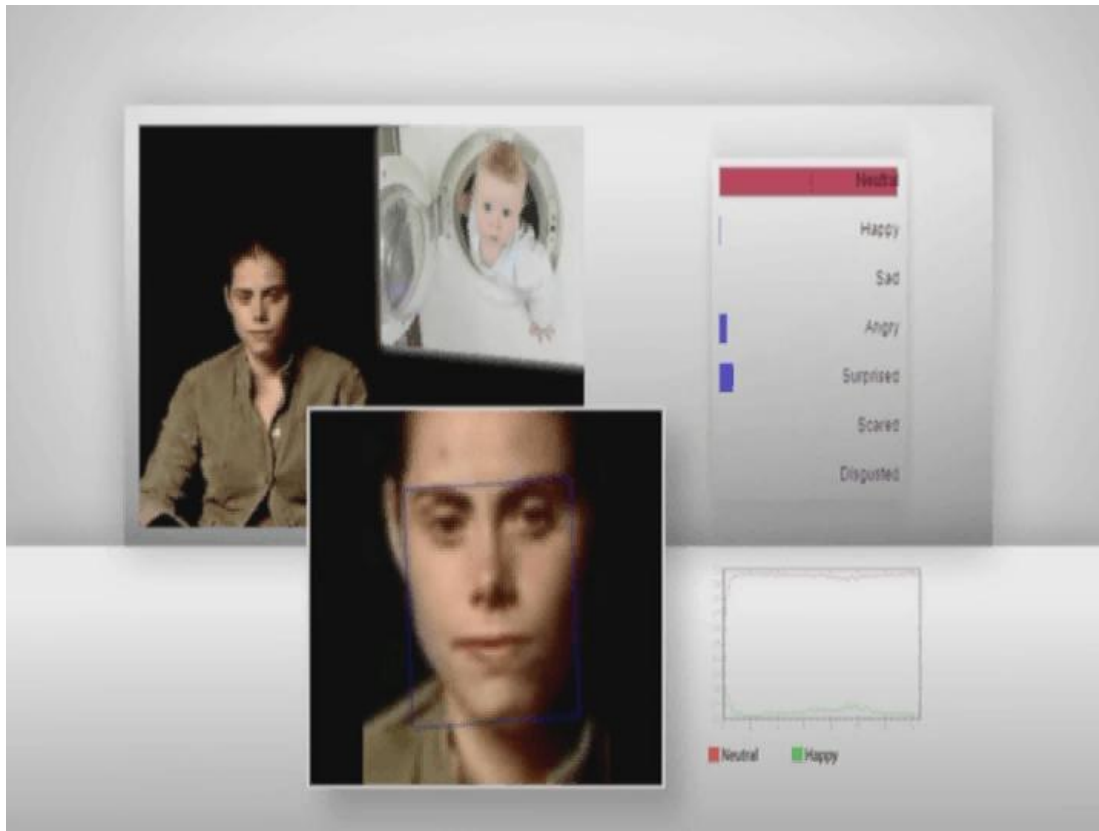
1. Describe behavior in an accurately and quantitatively
2. Rapidly gather rich and meaningful data
3. Automatic and accurate time recording
4. Integrate video & physiology in behavioral studies
5. Calculate statistics and create transition matrixes
6. Analyze groups of observations at once
7. Filter out exactly the relevant things
8. Make clips of interesting video and data
9. Always complete and consistent data
10. Quality control and teamwork support

FaceReader™

- Live or from video
- Now: six basic emotions classified automatically
- Future: customize expressions to be recognized



FaceReader®



uLog

Capture system interactions

- **uLog Lite**

- Get your free copy at www.noldus.com
- Stand alone logging
- Limited logging: *mouse & keyboard*
- No filter functionality

- **uLog Pro**

- Very powerful and flexible
- Stand alone and connected logging
- Logging: *mouse, keyboard, software functions*
- Data filter

A screenshot of the uLog software interface. The window title is "Hartijn1 - uLog". The main area displays a table with columns for "Event Time", "Behavior", "Behavior Modifier", and a fourth column. The table contains several rows of data, including event times, behaviors like "Key pressed", and behavior modifiers like "Internet Explorer" and "http://www.candysta". The status bar at the bottom indicates "Status: Review Mode".

	Event Time	Behavior	Behavior Modifier	
			578,00	
13	+0:00:11.031	Key pressed	Internet Explorer http://www.candysta	Right arrow
			1.882,00	
			578,00	
14	+0:00:11.515	Key pressed	Internet Explorer http://www.candysta	Left arrow
			1.882,00	
			578,00	
15	+0:00:13.437	Key pressed	Internet Explorer http://www.candysta	Right arrow
			1.882,00	
			578,00	
16	+0:00:14.975	Key pressed	Internet Explorer http://www.candysta	Right arrow
			1.882,00	
			578,00	
17	+0:00:15.975	Key pressed	Internet Explorer http://www.candysta	Right arrow
			1.882,00	
			578,00	
18	+0:00:16.640	Key pressed	Internet Explorer http://www.candysta	Right arrow
			1.882,00	
			578,00	
19	+0:00:17.594	Key pressed	Internet Explorer http://www.candysta	Left arrow
			1.882,00	

Theme

Tool for pattern detection in data sets

wakbs ck dw qkw wwkwck wazbz kcuodgk

Can you see the pattern? Theme does!

wakbs ck dw qkw wwkwck wazbz kcuodgk



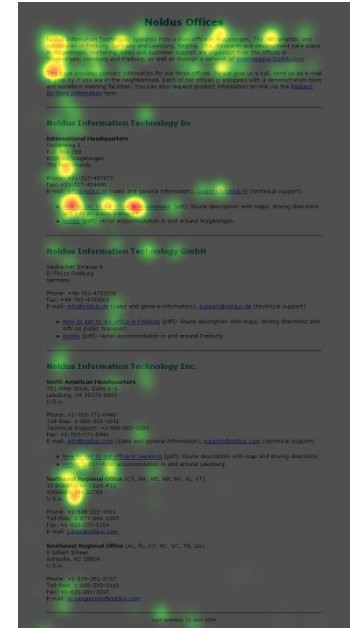
a b c d



a b c d

Eye tracking

- Head mounted, in computer screen, or stand alone
- Measure:
 - where the subject looks
 - how long and often he looks at something
 - path the eyes follow between predefined areas of interest
- Analysis: eye tracks, hotspots, fixations, areas of interest



Eyetracking



Integrated Solutions

Tailor-made observational labs and systems

- Portable Observation Lab
- Stationary Observation Lab
- Home Lab
- Restaurant of the Future



Home lab

Observing and testing

- Behavior in home setting
- Eating and drinking
- Consumer-product interaction



Philips Research



Eindhoven University of Technology



TNO Human Factors

Restaurant of the Future



A normal university cafeteria?

Look inside...



Diners being observed

Observational research



- Observe food selection and consumption
- Study effects of environmental and social variables



Questions?

Thank you for your attention!