Conduct Vision Software Manual

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1. Install and Run Application

The application can be installed in folder C:\ConductScience. There are subfolders

ConductVisionF\ConductVisionPy ConductVisionF\ConductVisionUI

The executable is ConductVisionUI\bin\ConductVisionUI.exe. Double click on the executable. The application appears as below:

Maze Engineers Conduct - hh	U			- 0 ×
OpenField *				📑 🎲 ·
UP Concernence Protocols	Openhad Protocol Openhad Result Bahavor Measur Animal Tank Log Protocol Parens This 1-36 Uses Source & Wake Free Cames Track Free Head Soc		Open Fald Dawing Data Rect: 0 Rect+0 Rect+0 Canne Rect 0 0 640 300 Show Rate Participation 4 Actual Lengthiom 0 If Show Girds	Gperiment Pun enter Protocol Result Name Statu: Statu:
	Video Trading	Open Field Drawing Work 5 [2] Note Image: Solid Soli	Tacking Details	Coenfield
Current Protocol Protocol ID: -1 Name Maze Type LastUpdated: Hected Result:				

2. Maze Types

Click on the maze type field to view or select a maze type. You can switch to another maze without having to restart the application.

The maze types are defined in the package the user purchased. Pack1 is currently available.

- Pack1: Barnes, Light-Dark, Novel Object, OpenField, OpenField4 (Open Field Set of 4), Elevated Plus, Radial Arm, T-maze, Y-maze, U-maze (User defined maze)
- Pack2: Sociability, Phenotyping, Water Maze
- PackFish: Zebrafish
- PackFC: Fear Conditioning System
- PackAuto: Automated mazes

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OpenField				1 😫 🏟 -
© OpenField © OpenField © ElevatedPlus © LightDark © Barnes © NovelObject © RadialArm © Imaze © Traze © K Cancel _d	OpenField Protocol OpenField Result Behavior Measure Animal Protocol Parans	Track Log Load v Stop	Open Field Drawing Data RectX: 0 RectW: 0 RectW: 0 Canvas Rect: 0 Show Ruler Pixel Length: 100 Actual Length(cm): Show Grids	Experiment Run rent Protocol: Result Name Start Video Service Status Stream: 10 Stream: 10 Stream Urr; localhost2030
	Video Tracking	Open Field Drawing VRows: 5 S NCols: 5 S	- Tracking Details TriaL. Seq Area X Y Z Time From	Log Log Level: None -
Current Protocol Protocol ID: 1 Name: Maze Type: LastUpdated: alected Result:				

3. Video Service Connection

To use AI based video tracking service, the user needs to start the service stream. When the service stream is established, the status field shows text Started and color becomes green. If there is a need to stop the stream because of the exception, click on the stop button and then start again.

When the application starts, it is in the stop state.

The stream uses local machine port 8030. It is usually available for users. If the port is blocked, please contact your system administrator to open the port.

距 Maze Engineers Conduct - hhe_1			- 🗆 ×
OpenField •			: 📑 🎲 -
Copenfield Protocol Openfield Protocol Openfield Protocol Openfield Protocol Openfield Protocol Openfield Result Protocol Params Trails 1-30: 10 Trail Dur(s): 30 Auto Trial Video Source Video Tie Track Part: Head Preview	Track Log	Open Field Drawing Data RectX: 0 RectY: 0 RectW: 0 RectH: 0 Canvas Rect: 0 0 640 360 Show Ruler Pixel Length: 100 Actual Length(cm): 0 Show Grids	Experiment Run rent Protocols Result Name Start: Progress Video Service Status Stream: Status: Started Stream Uri: localhost 8030
Current Protocol Protocol Name LastUpdated: lesuit:	Open Field Drawing VRows: 5 © NCols: 5 ©	Tracking Details	Log Log Levet None •

3. Experiment Configuration

The application provides a user interface to configure and execute experiments (protocols) and view execution results.

3.1 New Experiment

To create an experiment protocol, right click on "OpenField Protocols" on the left panel. A menu item New appears as shown below:

The Maze Engineers Conduct - htt	e_1			- 🗆 X
OpenField *				🖹 🏟 •
Experiment Protocols	OpenField Protocol OpenField Result Behavior Measure Animal Protocol Params 10 Trial Dur(s): 30 Auto Trial Video Source: © Video File	Track Log	Open Field Drawing Data RectX: O RectV: O RectV: O RectV: O 640 350 Show Ruler Pixel Length: 100 Actual Length(cm): O Show Grids	Experiment Run rent Protocols Result Name Start: Progress: Video Service Status Stream: #6 Stream Unit: localhost.8830 Log Log Levet: None
Current Protocol Protocol ID 1 Name Maze Type LastUpdated Jected Result	Video Tracking	NRows: 5 NCols: 5	Tracking Details	OpenField

If a different maze like LightDark is selected, the protocols will be "LightDark Protocols".

Click on New menu item, a "New Experiment" window appears as shown below. Fill in an experiment name and click on Save button.



Once the experiment is created, it appears in the folder "OpenField Protocols" as shown below:

The Maze Engineers Conduct - hhe	1	- 0 ×
OpenField *		📔 🎲 -
Experiment Protocols	OpenField Protocol OpenField Result Behavior Measure Animal Track Log Protocol Params Trail Dur(s): 30 \$ Auto Trial RectV: 0 RectV: 0	Experiment Run rent Protocol: X Result Name: X.Res Start: Video Service Status Stream: Status: Stopped Stream Uri: Iocathost8030 Log Log Levet: None -
		Openfield
Current Protocol Protocol ID: 0 Name: X Maze Type: OpenField LastUpdated: slected Result:		

An experiment can be deleted by right click on the experiment. The current active protocol is indicated in the left bottom of the screen.

3.2 Configure Parameters

To configure an experiment, double click on the experiment under the folder "OpenField Protocols".

Waze Engineers Conduct - hhe_1			- 🗆 X
OpenField *			i 📔 🎡 -
CopenField Protocol OpenField Result Protocol OpenField Result Protocol Params Trials 1-30: 10: Trial Dur(s): 30: Auto Tria Video Source: @ Video Fie Orenere Track Part: Head Track Part: Head	Track Log	Open Field Drawing Data RectX: 0 RectY: 0 RectW: 0 RectH: 0 Canvas Rect: 0 0 640 360 Show Ruler Pixel Length: 100 Actual Length(cm): 0 If Show Ginds ■	Experiment Run rent Protocol: X Result Name: X.Res Start: Video Service Status Stream: #2 Stream Ur: Iocathost8030 Log Level: None
Current Protocol Protocol ID: 0	NBows 5 NCots 5	Tracking Details	OpenField
Name: X Maze Type: OpenField LastUpdated: thected Result			

3.2.1 Protocol Parameters

- Trials (1-30) represents number of the trials to continuously run in the session
- Trial Durs(s) represents the trial duration in seconds
- Auto Trial If selected, the next trial will automatically start after the completion of a trial. If not selected, a dialog will appear asking the user to place the animal in the starting position before starting.
- Video Source Video file to track a video file, the user needs to load a video file.
- Video Source camera this is to track rodent in real-time
- Preview in living tracking mode, the user can preview the maze; stop preview will
 produce a thumbnail that can be used for drawing the tracking areas.
- Track Part the user can choose the track part, either head or body. Some mazes only allow for head tracking.

3.3 Area drawing

There are two styles of drawing: rectangular area and polygon.

Rectangular area drawings include

- Barnes
- Light-Dark
- Novel Object
- OpenField
- OpenField4 (Open Field Set of 4)

Polygon area drawings include

- Elevated Plus
- Radial Arm
- T-maze
- Y-maze
- User defined maze

3.3.1Drawing a Rectangle

- Click Button in the Open Field Drawing group to enable the drawing mode.
- Select NRow and NCol
- On the maze, select the point on the left up corner and drag to the right bottom inside the maze
- After the drawing, click Save button on Drawing Data group.



3.3.2 Drawing a Polygon

- Enable Button in Radial Arm Drawing group to enable drawing mode
- Select a radial arm
- Click four points of an arm to form a polygon
- After the drawing, click Save button on Drawing Data group.



3.4 Ruler

In software, the camera image distance is defined as pixels. We are interested in reporting the distance meters like cm. So, we need to know the pixels distance on screen maps to meter distance cm.

- Click on the Show Ruler button, and a line appears on the maze
- Draw the ends of the line to two end points of the maze
- Enter the real distance in the field.
- Click Save button the save the data



4. Experiment Run

To execute an experiment, select the protocol under "Protocols" on the left navigation panel and double click on it. Make sure the service stream is connected.

4.1 Run Experiment

Enter a name for the experiment run and click Start button. This will set system in the running state.

E Maze Engineers Conduct - hhe	e1												- 0 ×	1
LightDark *												i 📑 🎲 -		1
Experiment Protocols ^	LightDark Protocol LightDark Result Behavior Measure Animal Track Log											Experiment	Run	ľ
 IghtDark Protocols 	Protocol Params		Light Dark Dra	wing Data								Port of Alama	10 X	
4 · · · · · ·	Trials 1-30: 1 🗯 Trial Dur(s): 15 🗘 Auto Trial		Unit	х		Y		W		н		Pressar result		
Experiment Results *	Video Source: Video File C:\github2\Video For Tracking\LightDark Load		Light			141	172		243		114 *	Star	t 00:18	ł
IghtDark Results	Camera Preview Stop		Dark			135	98		261		76	Progress	2	l
	Track Part: Head		Canwas Rect:	0 0	640 3	360						Video Servi	ce Status	
			Show Ruler	Pixel Length:	100	Actual Len	gth(cm): 30					Stream	* 👪 🔯	
			Show Are	s 💾								Statu	s: Stopped	
												Stream Ur	ic localhost/8030	
												Log		
												Log Leve	& None -	4
	Vido Tadag	-Lght Dirk Dawling O Light ® Durk 😧 🔞 💌	Tracking Detail	s Area X 0 Light 1 1 Light 2 2 Light 3 3 Light 4 3 Light 4 5 Light 6 5 Light 6 1 Light 7 4 Light 8 1 Light 9 4 Light 9 1 Light	91 192 191 199 202 239 226 180 246 249	2 419 416 414 410 406 375 401 366 404 404 395	Time 0 18:15:26 0 18:15:26 0 18:15:26 0 18:15:26 0 18:15:26 0 18:15:26 0 18:15:26 0 18:15:26 0 18:15:26 0 18:15:26 0 18:15:26 0 18:15:26 0 18:15:26	FromSt F 0 0.0469 0.1369 0.1369 0.237913 0.2780 0.32780 0.32695 0.32695 0.3695	rame Sx 0 1 2 3 4 5 6 7 7 8 9	ale Sco 152 153 152 159 161 191 180 144 199 199	ale 251 249 248 243 243 225 240 219 242 237			
			1	10 Light	256	392	0 18:15:26	0.4584	10	204	235			I
			1	12 Light	255	383	0 18:15:26	0.5466	12	203	233	OpenField	1	1
			1	13 Light	244	377	0 18:15:26	0.5921	13	195	226			1
			1	14 Light	238	369	0 18:15:26	0.6397	14	190	221			
	No. I		1	15 Light	244	360	0 18:15:26	0.6863	15	195	216			
	inac 1 .		1	16 Light	246	356	0 18:15:26	0.7323	16	196	213			
Current Protocol												-		
Protoci ID: 0 Name: x Maze Type: LightDark LastUpdated: Nected Result:														

When the start button is clicked, the button state becomes stop. User can click on a stop button to stop the session run.

The experiment will stop when total time reaches, or all trials are completed, or the user stops it.

In the Video Tracking group, the animal moves are tracked.

In the Tracking Details group, the track details are recorded. The data grid only should the latest trial. When a trial completes, the tracking data is saved.

4.2 Result Tables

Select the result from the left Experiment Result. The results are shown on the Result tab. There are five grids.

通 Maze Engineers Conduct - hh	he_1		- 0 ×
LightDark *			i 📑 🎲 -
Experiment Protocols *	LightDark Protocol LightDark Result Behavior Messure Animal Track Log		Experiment Run
✓ Ø LightDark Protocols ▲	Correct Realitions		rent Protocol: x
(i) x •	bi Name v Bardt Name v Bar		Result Name: x_Res
Comparison of Consultan	See Trans. 2020/13.1923-00 Contracts. 2020/13.1923-20. Comparison Contracts. 2020/13.1923-20.		Start: D 0.0:17
Experiment vesuits	dark time, Extender 11 (Second Complexe time, Extender 11 (Second Complexe)		Progress:
× Dight Dark Kesults	Summar Data M		Video Consico Status
9 H H	Calculate Calculate		video service status
	Triallo Area Scherfor Durke Jumpont Durker on Distance on Arithmet Area A A A A A A A A A A A A A A A A A A A		stream: 📭 🔛
	1 Upht 2 5 0 0.3 21566 722.2 0 Dark 135 98 261 76		Status: Stopped
	1 Dark 2 11 0 0.7 408.93 1363.1		Stream Un: localhost:8030
			Log
			Log Level: None *
	Replay Replay Details		
	Trial ID Seq ID GridID X Y Z Time FromStartSec FrameCount ScaledX ScaledY		
	1 1 Light 192 416 0 1823-12 0.0455245 1 153 249	÷.	
	1 2 Light 191 414 0 1823:12 0.0951151 2 152 248	-	
	1 3 Light 199 410 0 18:23:12 0.1415848 3 159 246		
	1 4 Light 202 406 0 1823:12 0.2020447 4 161 243		
	1 5 Light 239 375 0 182312 0,2430383 5 191 225		
	1 6 Light 226 401 0 182313 0 2394157 5 180 240		
	1 8 Lione 246 Add 1982313 03256789 8 199		
	1 10 Ught 256 392 0 1823/13 0 4620501 10 204 235		
	1 11 Ught 254 389 0 1823:13 0.509788 11 203 233		OpenField
	1 12 Light 255 383 0 1823:13 0.5549336 12 204 229		
	1 13 Light 244 377 0 1823:13 0.6640932 13 195 226		
	1 14 Light 238 369 0 1823:13 0.6517776 14 190 221		
	1 15 Light 244 360 0 1823:13 0.699962 15 195 216		
	1 16 Light 246 356 0 182313 0.7578428 16 196 213		
	Trialga: All 👻 💽 🔟 💆 FPS: 8 🗊 🖉 Show Track 🖉 Show Areas 1 17 Light 244 341 0 1823:13 0.7904371 17 195 204	-	
Current Protocol			
Protocol ID: 0			
Name: x			
Maze Type: LightDark			
Lastilodated			
alested Paralle y Par			
sected result: X_Res			
	A'		

Current Result Status: show the protocol name, result name, protocol run start time, complete time and run status

Replay Group: it allows user to replay the video at a user defined speed (frame per second)

Replay Details: it contains all tracking data of the session (multiple trials)

Summary Result: shows the statistics of each area including the enter count, duration and distances.

Area Group: shows area drawing information. The data are not important for the user at this point.

5. Behavior Measure

西 Maze Engineers Conduct - hh		- 0 ×
LightDark	1	2 🚳 -
Experiment Protocols *	LightDark Protocol LightDark Result Behavior Messure Animal Track Log	xperiment Run
 DightDark Protocols x 	Charls R	esult Name: x_Res
	Distance × x.Res × 1 × 1 × 40	Start: 0 0.0:17
Experiment Results		Progress:
x_Res v		lideo Service Status
	20	Stream: 📢 🔟
		Status: Stopped
	0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1	Stream Uri: localhost:8030
	Texe	
	Saeed Measures	og
	Interval 1-605 2 Period 0-6005 0 60 60 8 Pesutis k Res • • • 1 • • • 1	Log Level, None
	Seq ID Result Trial ID Time Point Dist Privet Dist cm SpeedPavelSec [Speed cm/sec] Ref Seq Unit Result Trial ID Seq ID Area X Y Z Time FromStart Frame ScaledX [ScaledX] Dist Privet [Unit	
	1 x,Res 1 2 4262/2640 1278792 213.1320 639396 0.000 44 1 * x,Res 1 1 Light 192 416 0 1823.12 0.046 1 153 249 0.0000 1 *	
	2 x/kes 1 4 2141195 642358 1070597 321179 -15911 901 x/kes 1 2 /ught 191 414 0 182212 0095 2 152 248 1.41421 1 3 x/kes 1 6 344.5911 103737 172.7255 55.6847 9.785 136.1 x kes 1 3 /ught 199 410 0 182212 0.0142 3 159 246 7.28011 1	
	4 x,Res 1 8 228,924 68,674 114,4622 34,3387 68,757 113 1 x,Res 1 4 Lipht 202 406 0 182,212 0.002 4 161 243 3,60555 1	Ŧ
	5 x,Res 1 10 238.9910 71.6973 119.4955 35.8487 0.755 229 1 x,Res 1 5 Light 239 375 0 18:23:12 0.243 5 191 225 34.98571 1	
	6 x,Res 1 12 150.0128 45.0039 75.0064 22.5019 -6.673 275 1 x,Res 1 6 Light 226 401 0 18.23.13 0.284 6 180 240 18.60108 1	Ŧ
	7 x_Res 1 14 366.1175 110.4353 184.0588 55.2176 16.358 322 1 x_Res 1 7 Light 180 366 0 182.213 0.329 7 144 219 167733 1	t
	X, Yies 1 0 Light 240 404 0 1623(3 0.372 0 190 242 5005940 1 v Res 1 0 Linkt 240 305 0 197213 0.141 0 100 277 5 83005 1	
	x Res 1 10 Light 256 392 0 182213 0.462 10 204 235 538516 1	
	x,Res 1 11 Light 254 389 0 18:23:13 0.510 11 203 233 2,23607 1	
	▼ x Ret 1 12 light 255 383 0 1823-13 0.555 12 204 2229 4.12311 1 ▼	
	Rotation Measures Activity Measures	
	Period 0-600s 0 1 60 2 2	
	Trial Id Episode StartTime EndTime Direction DurSec AbsoluteAngle Unit	DeseEield
	· · · · · · · · · · · · · · · · · · ·	ipennielo
Current Protocol		
Protocol ID: 0		
Name: X	Rotation Details	
Maze type: LightDark	TriaL., Seq.,. Area X V Xc Yc Angel Xv Vv Time FromSt., Frame	
Lastupdated:		
nected result: X_Nes		

5.1 Temporal Move Measurement

The Behavior Measure tab provides calculations of the animal motor measurements.

It allows calculation of any number of results (multiple results), trials (multiple trials) or units (open field set of 4 has 4 units).

Charting provides drawing of the measurements (single trial or cross trial comparison).

5.2 Rotation Measurement

- **5.3 Activity Measurement**
- 5.4 Heatmap

6. Maze Protocols

6.1 Y-Maze Spontaneous Alternation

V ConductVision - hhe_1		- 0 ×
Ymaze -		i 📑 🎡 -
Experiment Protocols	Ymaze Protocol Ymaze Result Behavior Measure Animat Track Log	Experiment Run
Vmaze Protocols	Track Params Alternation Spec	Protocol: x
	Enter Name as Sequences V1 V2 V3:Y1 • O M TrialD SeqID Area X Y Time FromSt Frame	
Experiment Results	SeqID AlternationName Sequences	Start:
✓	1 aa Y1 Y2 Y3/Y1 Y3 Y2/Y2 Y1 Y3;	Progress:
3 x_Res ✓	2 bb /2 Y1 Y3/Y2 Y3 Y1/Y3 Y1 Y2;	Video Service Status
		Stream: 👪 🔯
		Status: Stopped
		Stream Uri: localhost:8030
	Video Tracking Y-maze Drawing	
	○ Y1 ○ Y2 ◎ Y3	
	📓 🕱 🥔	
	Ruler Length: 20 cm	
	I Show Arrs	
	12	
		FC
		15
Current Selection		
Protocol ID: 0		
Name: x		
Maze Type: Ymaze		
Result:		
Start Time:		
End Time:		

The Y-maze spontaneous alternation test is a behavioral test often used in research, particularly in neuroscience and psychology, to assess spatial memory and exploratory behavior in rodents.

The Conduct Vision software provides spontaneous alternation analysis using tracking data.

6.1.1 Y-Maze Alternation Specification

- There are six possible sequences for Y-maze:
 - Y1 Y2 Y3 Y1 Y3 Y2 Y2 Y1 Y3 Y2 Y3 Y1 Y3 Y1 Y2 Y3 Y2 Y1
- For a specification definition, the use can specify all sequences or a subset of the sequences and give a name. The screenshot below shows two definitions of alternation sequences aa and bb. Each protocol can have its specification of the sequences.
- To add a definition, give a name and choose a set of sequences and then click on Add button
- To remove a definition, select the data row in the grid and click the Remove button
- To save the specification, click the Save button.

 Once the specification is saved, it will appear on the result tab when a trial run is completed.

Ymaze Protocol	Ymaze Result	Behavior Measure	Animal	Track Log				
Track Params	Alternation Spe	C						
Enter Name a	a	Sequences Y1 Y2	Y3;Y1 🝷		•	8		
SeqID		AlternationNam	e	Sequer	nces			
		1 aa		Y1 Y2 Y	(3;Y1 Y3 Y2	;Y2 Y1	Y3;	•
		2 bb		Y2 Y1 Y	(3;Y2 Y3 Y1	;Y3 Y1	Y2;	
								•

6.1.2 Y-Maze Alternation Result

ConductVision - hhe_1		– 🗆 ×
Ymaze *		🖹 🏟 -
Experiment Protocols ^	Ymaze Protocol Ymaze Result Behavior Messure Animal Track Log	Experiment Run
Ymaze Protocols		Protocol:
l‰ x	Summary kesuit	Result Name:
4 III ->		Starts
Experiment Results ^	TrialID Area EnterCnt DurSec DurPct DistancePixel DistanceCm Animal	starc 😈
Ymaze Results	1 Y1 3 26 0.21 753.6 85.15 Black35	Progress:
🕱 x_Res 🗸 🗸	1 Y2 2 17 0.14 607.4 68.63 Black35 2 1 S0 Y2 9.482 12.600 3.118 Y1 Y2	Video Service Status
4 III	1 Y3 2 29 0.24 550.1 62.16 Black35 3 1 Y2 S0 12.600 21.558 8.958	
	1 S0 7 50 0.41 1431.3 161.73 Black35 4 1 S0 Y3 21.558 29.091 7.533 Y1 Y2 Y3 Alternation	stream: 📭 💟
	2 Y1 3 25 0.21 753.6 85.15 Black35 5 1 Y3 50 29.091 55.916 26.824	Status: Stopped
	2 Y2 3 17 0.14 618.1 69.84 Black35 6 1 50 Y2 55.916 65.146 9.230 Y2 Y3 Y2	Stream Uri: localhost:8030
	2 Y3 2 28 0.23 550.1 62.16 Black35 7 1 Y2 S0 65.146 73.116 7.970	
	2 S0 7 51 0.42 1539 173.9 Black35 8 1 S0 Y1 73.116 76.789 3.674 Y3 Y2 Y1 Alternation	
	9 1 Y1 S0 76,789 91,634 14,845	
	10 1 S0 Y1 91.634 101.830 10.195 Y2 Y1 Y1	
	11 1 Y1 S0 101.830 103.375 1.545	
	12 1 S0 Y3 103,375 113,136 9,761 Y1 Y1 Y3	
	13 1 Y3 S0 113.136	
	14 1 NA NA Total: 2 40 Black35	
	15 2 Y1 S0 0.000 9.472 9.472	
	Replay Replay Details	
	TrialID SeqID GridID X Y Time FromStart	
	1 1 Y1 396 185 23:19:39.873 0.000	
	1 2 11 402 186 23:19:39.920 0.047	
	1 3 Y1 404 186 23:19:39.991 0.118	
	1 4 Y1 407 184 23:19x10.043 0.170	
	1 5 Y1 413 184 23:19:40.090 0.218	
	1 6 Y1 415 183 23:19:40.148 0.275	
	1 7 Y1 419 185 23:19:40.253 0.380	
	1 8 Y1 421 185 23:19:40.274 0.402	HC
	1 9 Y1 425 186 23:1940.304 0.432	
	1 10 Y1 427 186 23:19:40.358 0.485	
Contract Calendary	1 11 Y1 430 184 23:19:40.408 0.535	
current selection	1 12 Y1 433 184 23:19:40.470 0.598	
Protocol ID: 0	1 13 Y1 437 184 23:19:40.522 0.650	
Name: x	1 14 Y1 439 185 23:1940.589 0.717	
Maze Type: Ymaze	1 15 Y1 443 186 (23:19:40.635 0.762	
Parult y Par	1 16 Y1 445 186 23:19:40.695 0.823	
Nesuit A_Nes	1 17 Y1 446 185 23:1940.748 0.876	
Start Time: 20241107 23	Trial(s): All 🕘 🖸 🗳 FPS: 4 💈 🖉 Show Track 🖉 Show Arms 🕴 1 18 Y1 449 183 23:19:40.797 0.924	
End Time: 20241107 23		

- On the result tab, the Spontaneous Alternation panel displays the result of alternation analysis.
- Choose the alternation specification name and the specification definition is displayed in the next field.
- Press button the calculation button *saved*, the alternation result is calculated and saved automatically.

- The calucation is done for each trial. At the end of the result of the trial, a summary line is displayed with number of alternations and the alternation percentage.
- Examples
 - Example 1: the first four rows shows arm entry sequence Y1Y2Y3. Since Y1Y2Y3 is in the definition, the sequence makes an alternation.

Visitld	TrialID	FromArea	ToArea	Enter(s)	Exit(s)	VisitDurSec	Sequence	Status	Percent	Animal
1	1	Y1	S0	0.000	9.482	9.482				
2	1	S0	Y2	9.482	12.600	3.118	Y1 Y2			
3	1	Y2	S0	12.600	21.558	8.958				
4	1	S0	Y3	21.558	29.091	7.533	Y1 Y2 Y3	Alternation		

• Example 2: the following four rows shows arm entry sequence Y3Y2Y1. Since Y3Y2Y1 is in the definition, the sequence makes an alternation.

	Visitld	TrialID	FromArea	ToArea	Enter(s)	Exit(s)	VisitDurSec	Sequence	Status	Percent	Animal
Γ	5	1	Y3	S0	29.091	55.916	26.824				
	6	1	S0	Y2	55.916	65.146	9.230	Y2 Y3 Y2			
	7	1	Y2	S0	65.146	73.116	7.970				
L	8	1	S0	Y1	73.116	76.789	3.674	Y3 Y2 Y1	Alternation		

• Example 2: the following four rows shows arm entry sequence Y2Y3Y2. Since Y2Y3Y2 goes back to Y2 after Y2Y3, it is not a spontaneous alternation.

Visitld	TrialID	FromArea	ToArea	Enter(s)	Exit(s)	VisitDurSec	Sequence	Status	Percent	Animal
3	1	Y2	S0	12.600	21.558	8.958				
4	1	S0	Y3	21.558	29.091	7.533	Y1 Y2 Y3	Alternation		
5	1	Y3	S0	29.091	55.916	26.824				
6	1	S0	Y2	55.916	65.146	9.230	Y2 Y3 Y2			

Total alternations

The last row of the entries for a trial shows the total alternations and alternation percentage

6.1.3 Y-Maze Alternation Calculation and Interpretation

Alternation Percentage

 $\label{eq:spontaneous} \text{Spontaneous Alternation Percentage} = \left(\frac{\text{Number of Alternations Made}}{\text{Possible Alternations}}\right) \times 100$

 $= \frac{Number of alternations Made}{(Y1 entries+Y2 entries+Y3 entries-2)} \times 100$

 A high spontaneous alternation percentage indicates good working memory and spatial awareness, whereas a lower percentage may suggest memory impairment or cognitive deficits. This measure is especially useful in studies on neurodegenerative disease, pharmacological interventions, and genetic modifications affecting memory and cognition.

For further detail, search chatgpt message "Y-maze spontaneous alternation percentage"

7. Animal

The tab provides a place for user to enter the animal information. The animal information then is applied to the results.



8. Export Data

Kaze Engineers Conduct - hhe	1			- 🗆 X					
LightDark				2 🚳 -					
Eventiment Protocolt	Habilton Date and Habilton Date Barbard and Manager Astron	Tracklas	1	Evaniment Pun					
Competition Protocols	UghtDark Protocol UghtDark Kesult Benavior Measure Animal	Irack Log	· · · · · · · · · · · · · · · · · · ·	ent Protocol:					
	Current Result Status			Result Namer					
Experiment Results *	Job Name: x	Result Name: x_Res	Run Status: Complete	Starte D					
🛩 🥬 LightDark Results 👘	Start Time: 20240717 18:23:10	Complete Time: 20240717 18:23:29		Start.					
🕱 🗶 Res 🔍 👻									
· / ·	Summary Result	Light Dark Areas		Video Service Status					
		Calculate Area X	Y W H	Stream: 🛃 🔯					
	TrialID Area EnterCnt DurSec	JumpCnt Light	141 172 243 114 *	Status: Stopped					
	1 Light 2	5 0 Dark	135 98 261 76	Stream Uri: localhost:8030					
	L Cark 2								
				Log Level: None -					
	4	· · · · · · · · · · · · · · · · · · ·	*						
	Replay	Replay Details							
		Trial Seq GridID X	Y Z Time FromStar., Fram., Scale., Scale.,						
		1 1 Light 192	2 416 0 1823:12 0.0455245 1 153 249						
		1 2 Light 191	1 414 0 1823:12 0.0951151 2 152 248						
		1 3 Light 199	9 410 0 1823:12 0.1415848 3 159 246						
		1 4 Light 202	2 406 0 1823:12 0.2020447 4 161 243						
		1 5 Light 239	9 3/3 U 1823:12 U.243U383 S 191 22S						
	124	1 7 Light 180	366 0 1823:13 0.3286603 7 144 219						
		1 8 Light 246	5 404 0 18:23:13 0.3716789 8 196 242						
		1 9 Light 249	9 395 0 18:23:13 0.413636 9 199 237						
		1 10 Light 256	5 392 0 18:23:13 0.4620501 10 204 235						
	and an and a second sec	1 11 Light 254	4 389 0 18.23:13 0.509788 11 203 233	OpenField					
		1 12 Light 255	5 383 0 182313 0.5549336 12 204 229						
		1 13 Light 244	4 377 0 1823:13 0.0040932 13 193 220 8 369 0 1923:13 0.6517776 14 190 221						
	A CARE	1 15 Light 244	4 360 0 1823/13 0.699962 15 195 216						
		1 16 Light 246	5 356 0 1823:13 0.7578428 16 196 213						
	Trial(s): All 🔹 🚺 🛄 🔯 FPS: 8 🕻 🗹 Show T	rack Show Areas 1 17 Light 244	4 341 0 1823:13 0.7904371 17 195 204						
- Current Protocol									
Protocol ID: -1									
Name									
Maze Type									
Lattindated									
cascopulated.									
sected result. X_Res									

- Select a result
- Click the Export button
- The out is .csv file

9. Troubleshooting

9.1 Log display

🔁 Maze Engineers Conduct - hi	e_1	- 0 ×
LightDark *		📑 🎲 -
LightDark LightDark LightDark	Uptic/Der Protocol Uptic/Der Rescue Der Ander Tord Log Tord Log Tord Log Tord Log Data Log Tord Log Tord Log Tord Log Tord Log Data Log Tord Log Tord Log Tord Log Tord Log Data Log Tord Log Tord Log Tord Log Tord Log Data Log Tord Log Tord Log Tord Log Tord Log Data Log Tord Log Tord Log Tord Log Tord Log Data Log Tord Log Tord Log Tord Log Tord Log Data Log Tord Log Tord Log Tord Log Tord Log Data Log Tord Log	
Protocol ID: 0 Name: x		
Maze Type: LightDark		
elected Result: x_Res		

- The log content can be displayed on the screen.
- The log file is in the Log folder under your deployment folder C:\ConductScience\bin\Log

9.2 Database files and user data

The database file contains the protocols and results. There is a separate folder containing database files and video data for each maze under bin.