

VREVAL

Result Analysis & Evaluation

Edited by

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ABOUT DOCUMENTATION & RESULT ANALYSIS

About Documentation

Each study must be well documented.

For the purpose of documentation, different archive files can be downloaded from the VREVAL website.

The following documentation / archive can be downloaded:

- Project
- Evaluation
- Participant Log
- Evaluation Results

About Result Analysis

A key for a useful study is the evaluation and interpretation of the results.

Each task can get interpreted differently. It is very important, to know, that the basic result evaluation methods are, to dive even deeper into the analysis. If the basic result analysis process is known, even better research question can be asked.

2. RESULT ANALYSIS

About

The study results can be downloaded from

<https://database.architektur.uni-weimar.de/>

The study results can be found under the participation codes (evaluation is published).

The result file is saved in the format json. Per entry a task is saved.

To get the results displayed in Revit, Dynamo is used.

To analyse the queries, the json file must get translated to a CSV file. The CSV file is created by Dynamo as well. The CSV file can be opened and analysed in Excel.

The results in Revit or CSV Files will be only generated, if the specific family *VREVALResultMarker.rfa* is loaded.

Revit Family

General Family with the following instance parameter:

evaluation_id
project_snapshot_id
evaluation_snapshot_id
group_id
classification
completed_at

playlist_id
playlist_name
scenario_id
scenario_name
task_id
task_name
task_code

participant_id
UUID
sequence_index
checkpoint_name

result_form_field_id
result_results



Marker

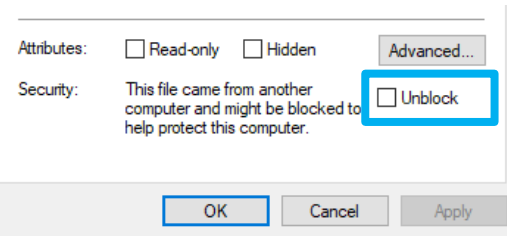
2.1 DYNAMO PACKAGE „VREVAL“

Install

Copy the unzipped VREVAL Package into the Dynamo Package folder.

Don't forget to unblock the Zip File before extracting.

(right click at Zip File -> Properties)

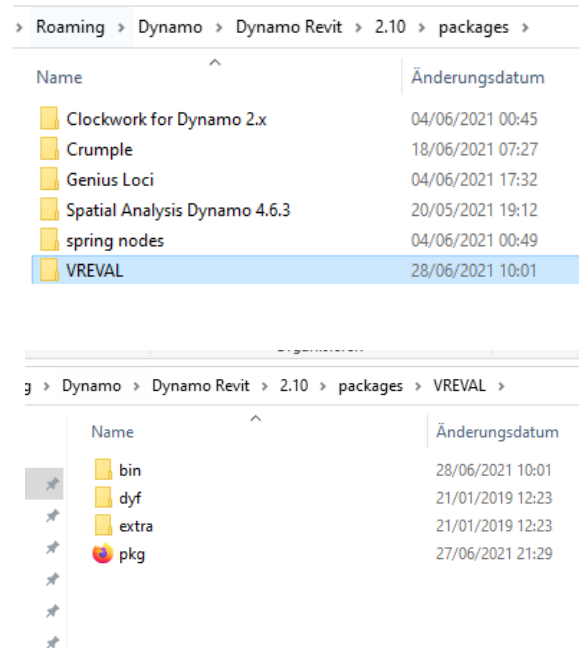


The default package folder is

`%USERPROFILE%\AppData\Roaming\Dyna
mo\Dynamo Revit`

And navigate to

`\[DynamoVersion]\packages`



Dynamo Package Folder Structure

*E.g.: The package content (Add-on)
VREVAL is located in the folder
VREVAL*

The Dynamo Package has the following structure.

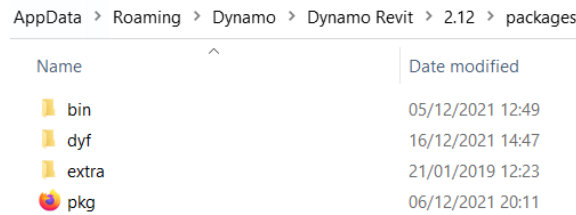
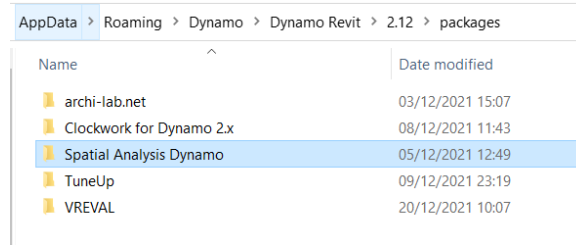
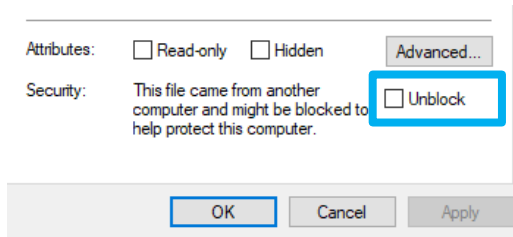
The folder structure must be maintained.

2.1 DYNAMO PACKAGE „AVEVAL“

Install

Copy the unzipped VREVAL Package into the Dynamo Package folder.

Don't forget to unblock the Zip File before extracting.
(right click at Zip File -> Properties)



Dynamo Package Folder Structure
E.g.: The package content (Add-on) Spatial Analysis Dynamo

The Dynamo Package has the following structure.

For few functions and calculations, the AVEVAL Package is required in the workflow of analysing VREVAL Result Data.

The default package folder is

`%USERPROFILE%\AppData\Roaming\Dyna
mo\Dynamo Revit`

And navigate to

`\[DynamoVersion]\packages`

The folder structure must be maintained.

3.1 TRANSFORM RESULT DATA WITH DYNAMO

Get Analysis Results

A first look at the results can bring some inside views for the final result evaluation.

To get all formular inputs and task results, the quickest way is to use the provided script for the Dynamo Player.

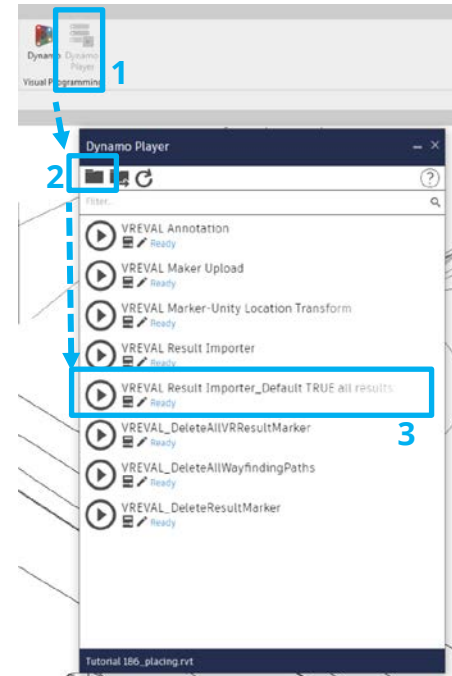
Before the script will run successfully, the VREVAL Dynamo Package must be copied in the Dynamo Package directory.

Step 1

Insert the Revit Family VRResultMarker.rfa

Step 2

Open the Dynamo Player (1) and select the directory (2), where the Dynamo script is saved. Open the Settings of the script (3).

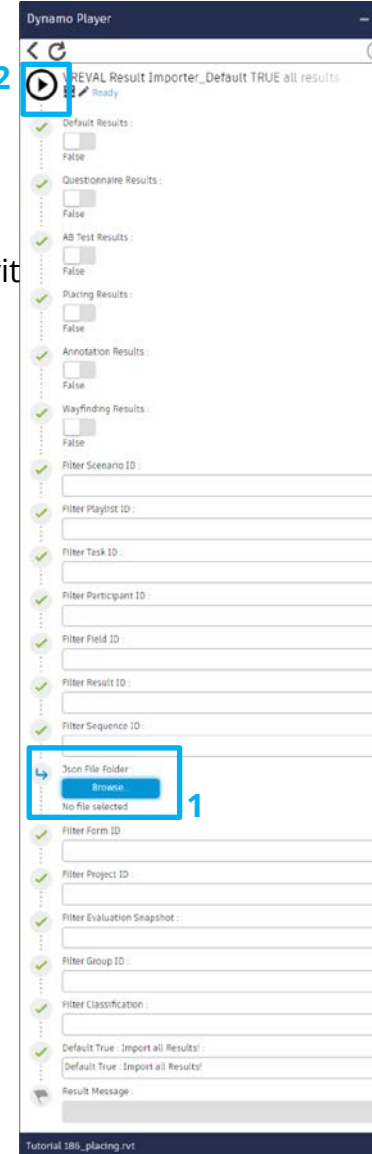


Step 3

By default (all sliders false) all results will be processed and loaded into Revit or written into CSV files.

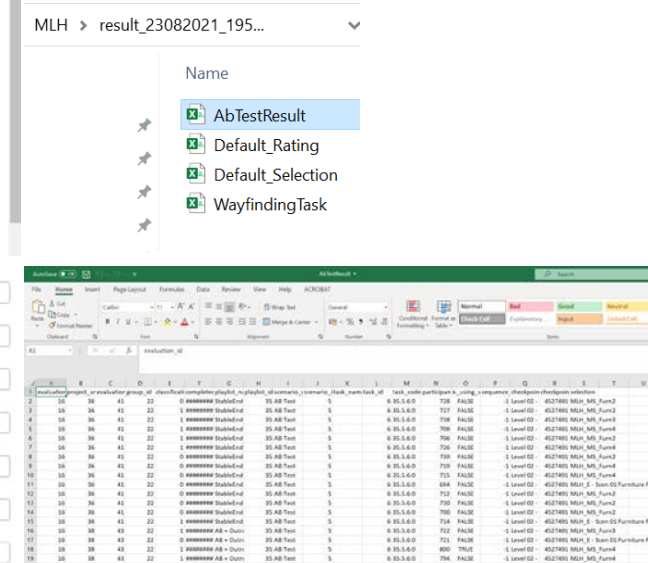
(1) Select Json File Folder.

(3) Run the script.



Step 4

Open the new generated files and check them in a table program.



(Step 5)

Copy the CSV data into the sheet *Results* of the provided Excel template file.

Analyse the results.

3.2 TRANSFORM RESULT DATA WITH DYNAMO

Filter

Result data can be filtered by:

- Scenario ID
- Playlist ID
- Task ID
- Participant ID
- Field ID
- Result ID
- Sequence ID

To find out more about your data, first run the VREVAL Result Importer once and have a look over it.

Dynamo Player: Filter

The filter works through IDs.
If more than 1 ID is used, the IDs get separated by comma.

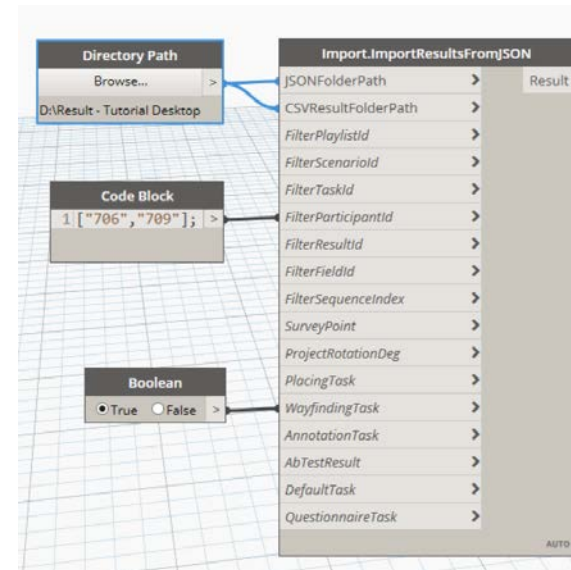
Example:
"706,709,712"

The screenshot shows the 'Wayfinding Results' section of the Dynamo Player. It includes a green toggle switch for 'Wayfinding Results' which is currently turned on. Below this are several filter input fields, each with a green checkmark icon to its left. The 'Filter Scenario ID' field is empty. The 'Filter Playlist ID' field is empty. The 'Filter Task ID' field is empty. The 'Filter Participant ID' field contains the text '706,709,712'. The 'Filter Field ID' field is empty.

Dynamo Script: Filter

The filter works through IDs.
If more than 1 ID is used, the IDs get separated by comma. The ID must be a "string". The IDs are collecting in a list [].

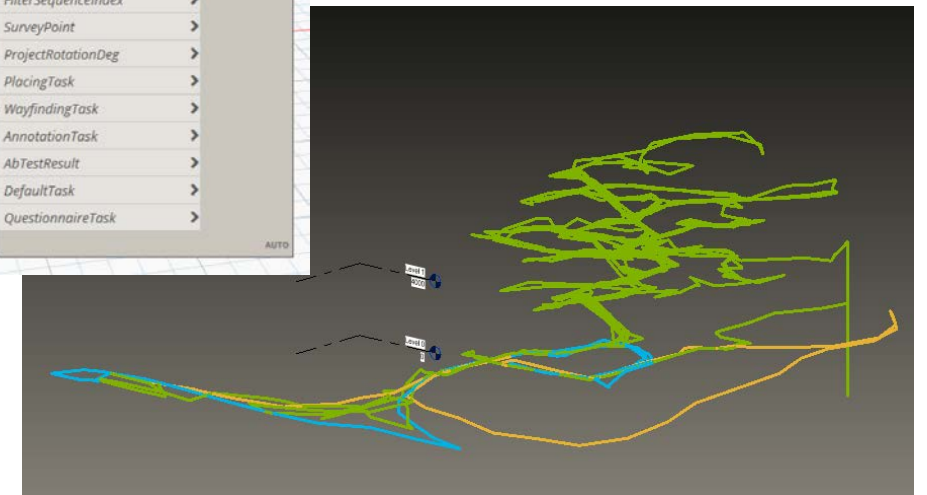
Example:
["706","709","712"];



Note:

The RESULT json file must be in a folder which only contains RESULT json files.

Other json files, also in SUBFOLDER, which are not RESULT files, will create error if Dynamo reads in the data.



3.2 TRANSFORM RESULT DATA WITH DYNAMO

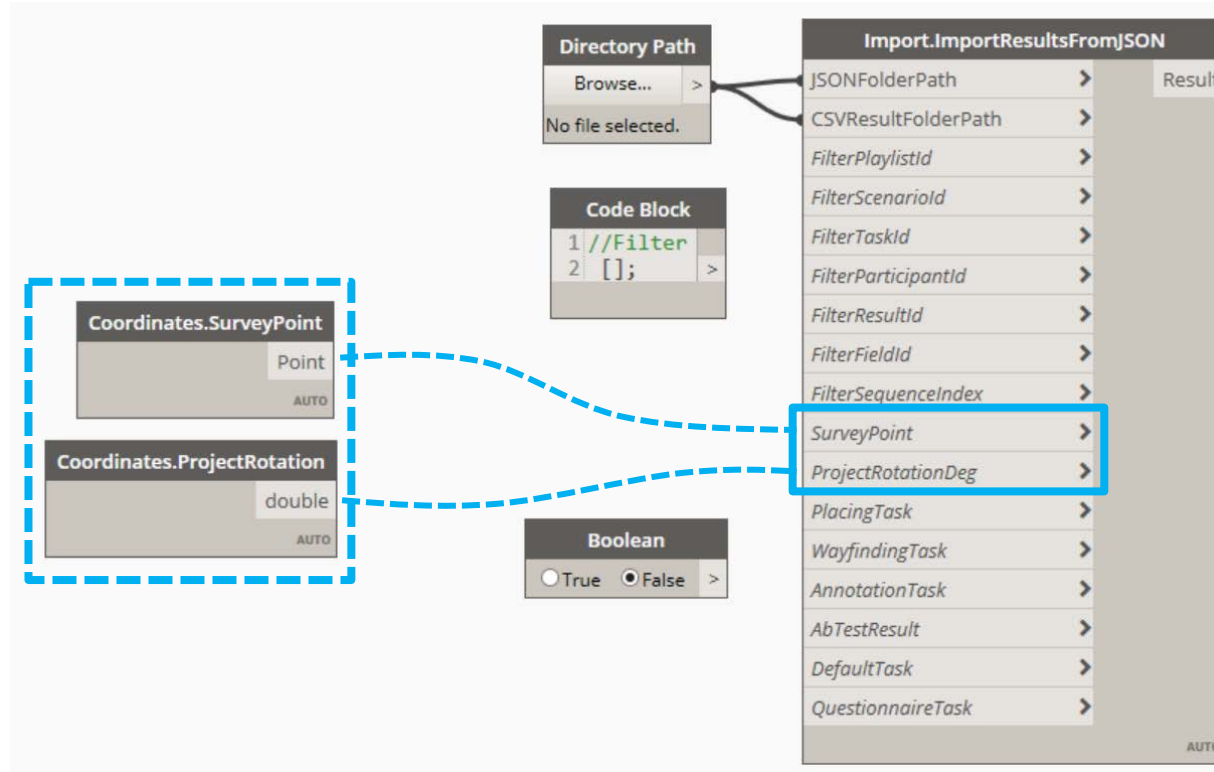
Survey Point & Project Rotation

By **default**, the Survey Point and Project Rotation correction is conducted for Wayfinding, Placing and Annotation Visualizations in Revit.

The Survey Point and Project Rotation gets read out from the json result file.

If a costume correction is required,

- for the survey point the *SurveyPoint* from the Revit File can be extracted or a user defined *Point* can be used.
- For the Project Rotation the *ProjectRotation* of the Revit file can be extracted or a user defined *Number* can be used.



Note:

The RESULT json file must be in a folder which only contains RESULT json files.

Other json files, also in SUBFOLDER, which are not RESULT files, will create error if Dynamo reads in the data.

4.2 RESULT ANALYSIS: FORM RATING

CSV

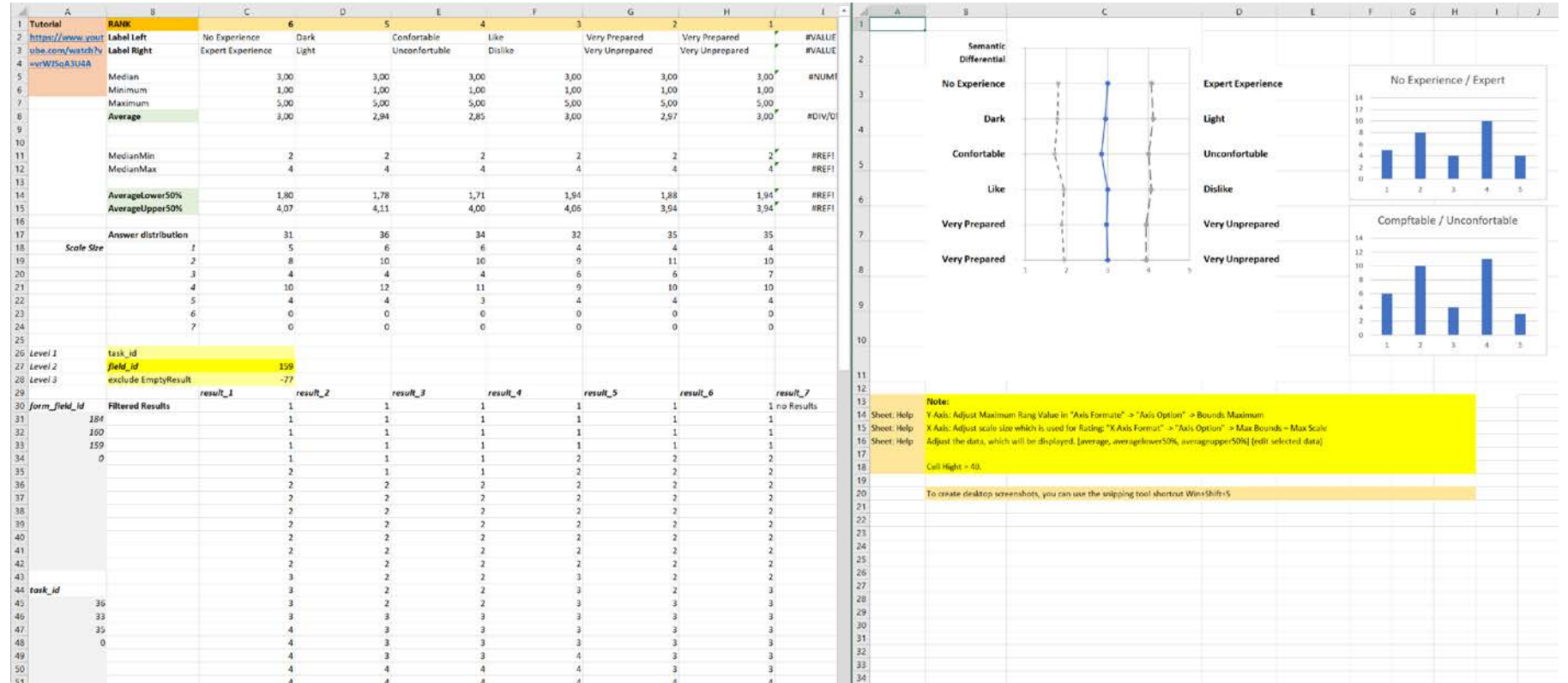
The CSV for Rating is generated by a Dynamo Script (package VREVAL)

Selecting results are saved by each task type (Default, Questionnaire, ABTest, Wayfinding, etc.)

A Excel Template File *VR_Evaluation_Template_Rating* can be used for predefined analysis. Copy the CSV data into the sheet *Rating Results*.

The data can be filtered by **task_id** and **form_field_id** in the sheet Evaluation-Calculation.

The charts can be modified. More charts can be created.



4.3 RESULT ANALYSIS: AB TEST

CSV

The CSV for AB-Test is generated by a Dynamo Script (package VREVAL)

task_id	
sequence_index	2

A Excel Template File *VR_Evaluation_Template_AB* can be used for predefined analysis. Copy the CSV data into the sheet *AB Results*.

The data can be filtered by **task_id** and **sequence_index**.

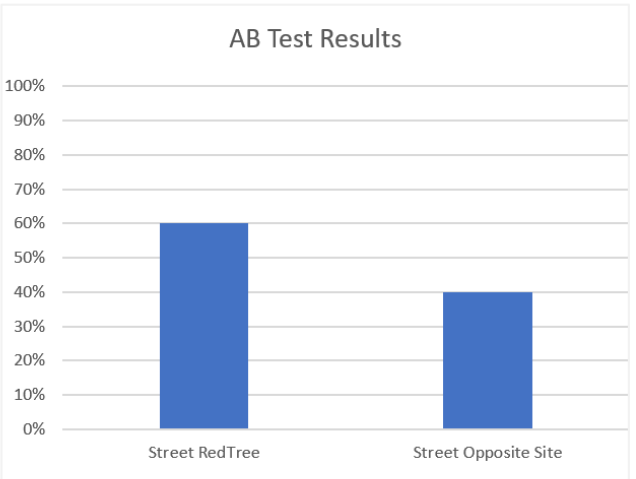
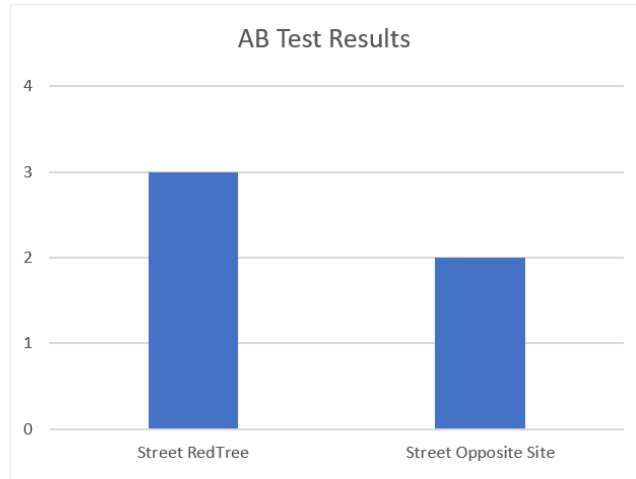
The charts can be modified. More charts can be created.

Unique Results:
Street RedTree
Street Opposite Site

Model Names	Count	%
Street RedTree	3	60%
Street Opposite Site	2	40%

Note: Change the Chard regarding your data input

Filtered Results:
Street RedTree
Street Opposite Site
Street RedTree
Street Opposite Site
Street RedTree



4.4 RESULT ANALYSIS: WAYFINDING

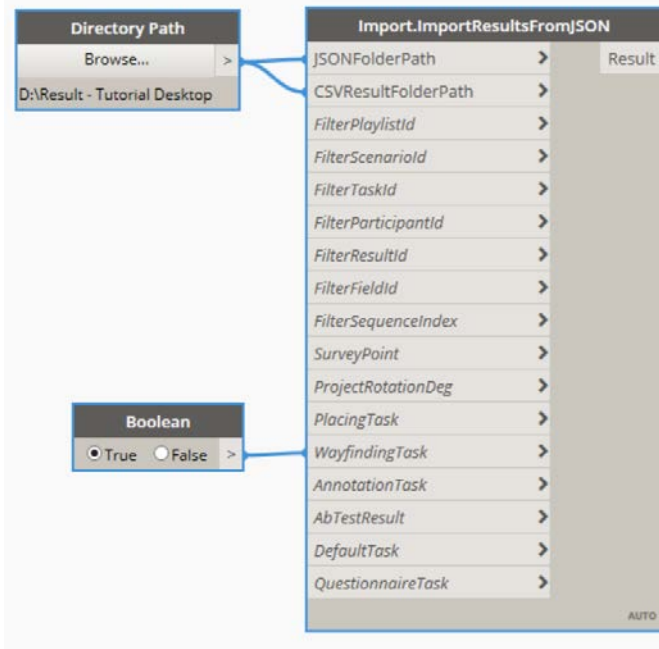
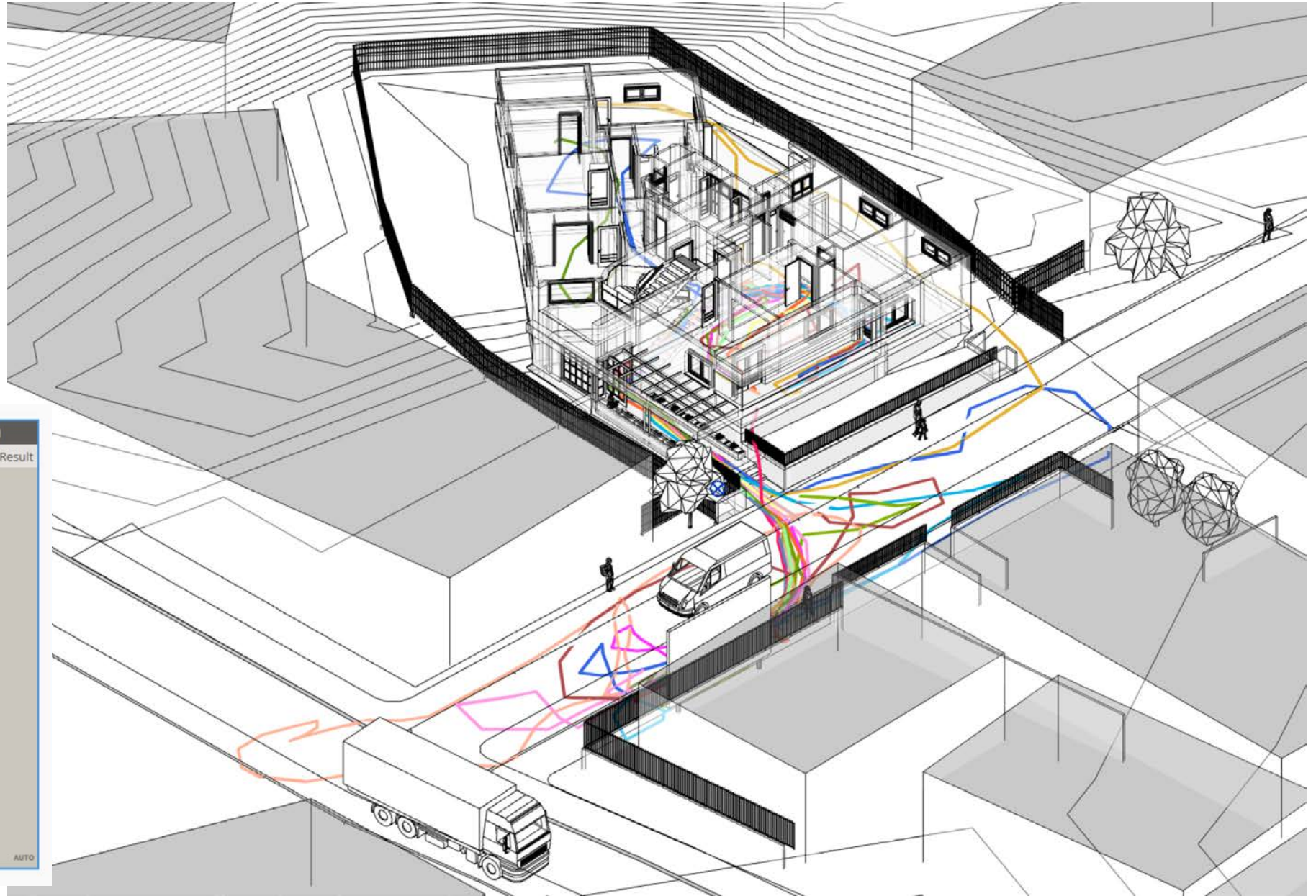
Revit

Wayfinding results are displayed as grouped lines. Per participant an individual colour is used.

With Dynamo more specific analysis like speed and HMD turns can be analysed.

Recommendation

Run the Dynamo script in manual mode.



4.4 RESULT ANALYSIS: WAYFINDING

CSV

Next to the travelled paths, a CSV file can be exported. The CSV file is generated by a Dynamo Script (package VREVAL).

Information about travelled to checkpoints and travel time can be calculated.

A Excel Template File *VR_Evaluation_Template_Wayfinding* can be used for predefined analysis. Copy the CSV data into the sheet *Wayfinding Results*.

The data can be filtered by Task ID.

The analysis tables can be modified.

Start Checkpoint by ID

Task ID 6

Participant ID	Sequence Index			
	0	1	2	3
694	0	87	88	89
712	0	87	88	89
730	0	87	88	89
700	0	87	88	89
714	0	87	88	89
722	0	87	88	89
721	0	87	88	89

Start Checkpoint by Name

Task ID 6

Participant ID	Sequence Index			
	0	1	2	3
694	car	street	tree	entrance
712	car	street	tree	entrance
730	car	street	tree	entrance
700	car	street	tree	entrance
714	car	street	tree	entrance
722	car	street	tree	entrance
721	car	street	tree	entrance

Time from Checkpoint to Checkpoint

Task 4

Participant ID	Sequence Index			
	0	1	2	3
728	00:00:01	00:00:04	00:00:04	00:00:08
727	00:00:15	00:00:38	00:00:26	00:00:32
738	00:00:02	00:00:13	00:00:32	00:00:14
726	00:00:39	00:00:37	00:00:29	00:00:07
709	00:00:07	00:00:04	00:00:08	00:00:16
706	00:00:01	00:00:03	00:00:03	00:00:23
739	00:00:04	00:00:03	00:00:09	00:00:19
715	00:00:06			
719	00:00:01	00:00:37	00:00:03	00:00:19

End Checkpoint by ID

Sequence Index

Participant ID	Sequence Index			
	0	1	2	3
694	87	88	89	86
712	87	88	89	86
730	87	88	89	86
700	87	88	89	86
714	87	88	89	86
722	87	88	89	183
721	87	88	89	86

End Checkpoint by Name

Sequence Index

Participant ID	Sequence Index			
	0	1	2	3
694	street	tree	entrance	balcony
712	street	tree	entrance	balcony
730	street	tree	entrance	balcony
700	street	tree	entrance	balcony
714	street	tree	entrance	balcony
722	street	tree	entrance	backyard
721	street	tree	entrance	balcony

Start - End Checkpoint by ID

Sequence Index

Participant ID	Sequence Index			
	0	1	2	3
694	0 - 87	87 - 88	88 - 89	89 - 86
712	0 - 87	87 - 88	88 - 89	89 - 86
730	0 - 87	87 - 88	88 - 89	89 - 86
700	0 - 87	87 - 88	88 - 89	89 - 86
714	0 - 87	87 - 88	88 - 89	89 - 86
722	0 - 87	87 - 88	88 - 89	89 - 183
721	0 - 87	87 - 88	88 - 89	89 - 86

Start - End Checkpoint by Name

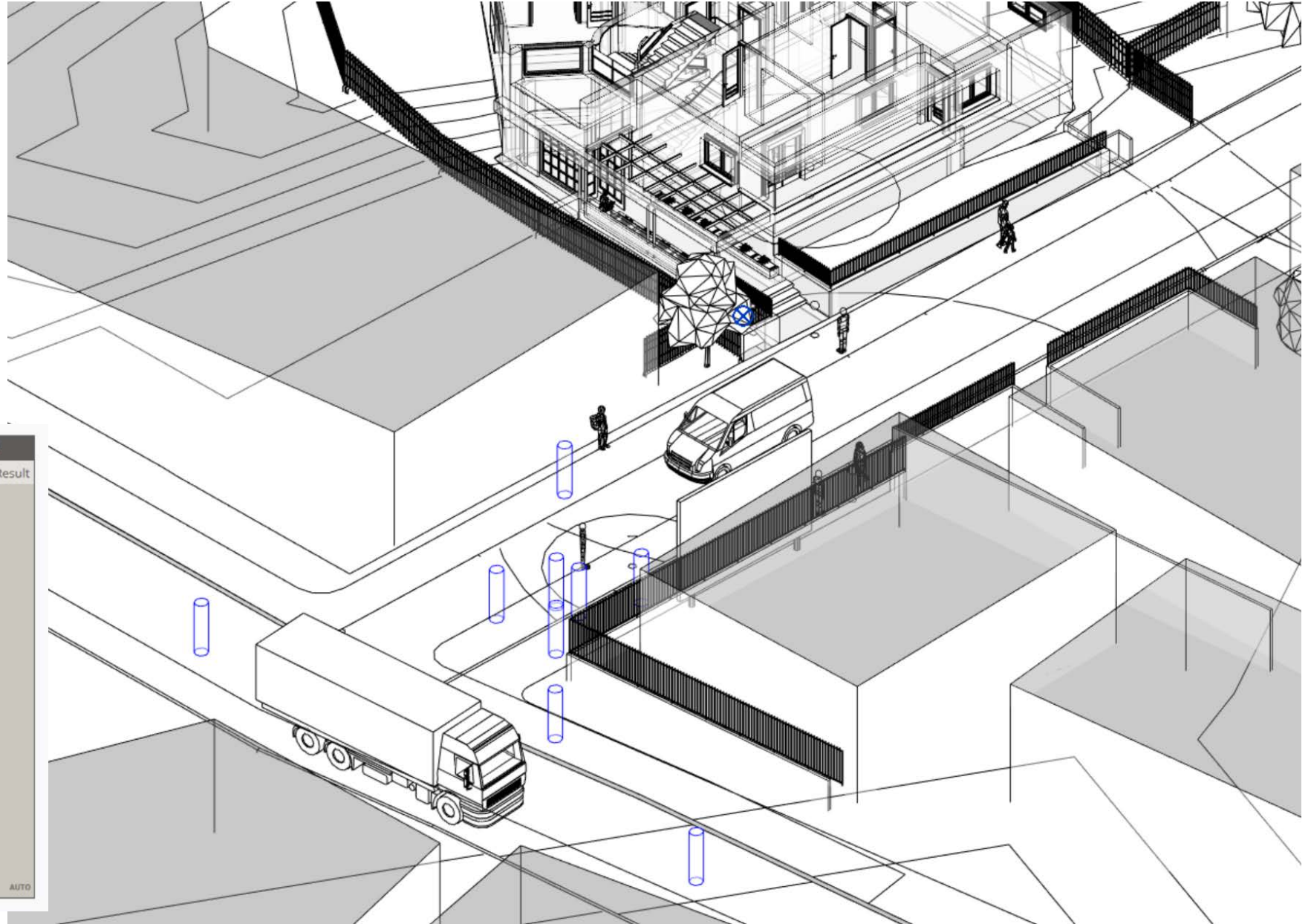
Sequence Index

Participant ID	Sequence Index			
	0	1	2	3
694	car - street	street - tree	tree - entrance	entrance - balcony
712	car - street	street - tree	tree - entrance	entrance - balcony
730	car - street	street - tree	tree - entrance	entrance - balcony
700	car - street	street - tree	tree - entrance	entrance - balcony
714	car - street	street - tree	tree - entrance	entrance - balcony
722	car - street	street - tree	tree - entrance	entrance - backyard
721	car - street	street - tree	tree - entrance	entrance - balcony

4.5 RESULT ANALYSIS: PLACING

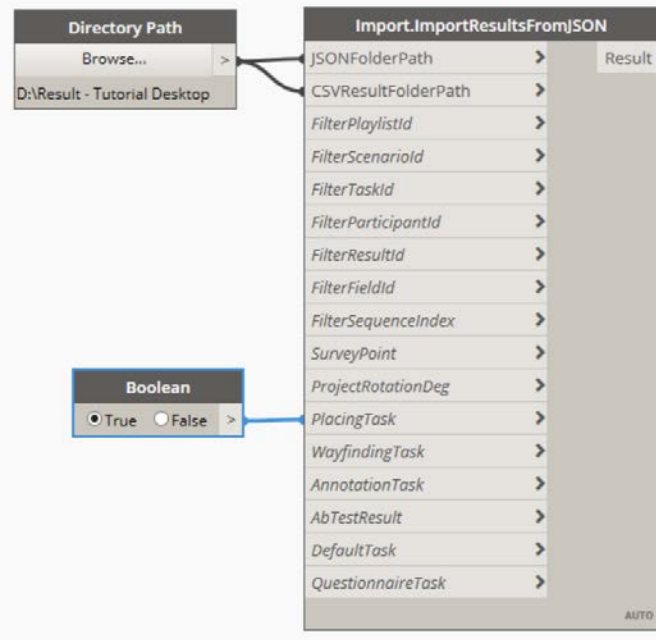
Revit

Placing results are displayed as small pillars. The family VRRResultMarker can be modified.



Recommendation

Run the Dynamo script in manual mode.



4.6 RESULT ANALYSIS: ANNOTATION

Revit

Annotation results are displayed as small pillars. The family VRRResultMarker can be modified.

For an annotation form-field Selecting or Rating, a CSV file will be created for further analysis.

Recommendation

Run the Dynamo script in manual mode.

