

# Scripts

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## Unity Seahaven

Script	Important Variables
VRTK_Touchpad walking	<ul style="list-style-type: none"><li>• Footstep sounds</li><li>• Walking speed</li></ul>
VRTK_headset Collision	<ul style="list-style-type: none"><li>• Ignore Target with Tag X</li></ul>
Pupil Gaze Tracker	<ul style="list-style-type: none"><li>• Pupilrecording</li><li>• EyesOpen</li><li>• RayDistance</li><li>• Server IP</li><li>• Service Port</li><li>• trainingStarted</li></ul>
PupilCalibMarker	<ul style="list-style-type: none"><li>• Points for validation</li></ul>
EyeGazeRenderer	<ul style="list-style-type: none"><li>• _image.enabled</li></ul>
recorder	<ul style="list-style-type: none"><li>• IsRec</li><li>• VPNum (counts automatically, only specify when needed)</li></ul>
Screenshot	<ul style="list-style-type: none"><li>• My Camera</li><li>• ResWidthN</li><li>• resHeightN</li></ul>
Auto Intensity	<ul style="list-style-type: none"><li>• Day rotate speed</li><li>• All other parameters you want to play with</li></ul>
(ShowMap)	Not in Seahaven 2.0

Commands: To be used during a session

Key	Effect	Associated Script(s)
R	Start/Stop pupil data recording	PupilGazeTracker
C	Start Calibration (17 points, whole field)	PupilCalibMarker -> PupilGazeTracker
V	Start 2D Validation (9 points, central)	PupilCalibMarker -> PupilGazeTracker
D	Start 3D Validation (9 points, central)	PupilCalibMarker -> PupilGazeTracker
S	Stop Calibration & Validation	PupilCalibMarker -> PupilGazeTracker
Q	Stop all recordings, save them and quit game	PupilGazeTracker, recorder
T	Start VR Training -> start pupil recording + Imoty recording, transform position to start position	PupilGazeTracker -> recorder
F	Fast validation with one point	PupilGazeTracker -> recorder
P	Pause the session and all recordings	PupilGazeTracker -> recorder

### DrawViewingPath:

Script	Important Variables
DrawViewingPath *	<ul style="list-style-type: none"><li>• Randomize</li><li>• VPNum</li><li>• RayDistance</li></ul>

Recordings:

File Name	Data	Script
EyesOnScreen_VP#	Variable: Gazes = 2D coordinates of gaze (normalized) =(CenterX,CenterY) or (0.000000, 0.000000)	PupilGazeTracker
EyeBoxPos_VP#	Variable: BoxPos = 3D coordinates of box position	PupilGazeTracker
Positions_VP#	(x,y,z,rx,ry,rz,timestamp (in sec),PupilTimeStamp)	Recorder
Validation2D+Num	Degree of error for each point + avg + time + last cal + error in x and y dir (+avg)	PupilGazeTracker
Validation3D+Num	Degree of error for each point + avg + time + last cal	PupilGazeTracker
(MapView)	Duration of each time the map was looked at	ShowMap
ViewedHouses_VP#	HouseViewed, distance, timestamp (sec. since start)	DrawViewingPath
Heatmap3D(Random Gaze/RandomPos)_VP#	List of (x,y,distance) of fixations during the session	DrawViewingPath

- ViewedHouses:
  - House# -> House was looked at
  - NH -> No house was looked at
  - Distance =
    - 0 -> Low confidence (<0.5)
    - 200 -> No object hit (eg: sky)
  - D -> House/obj. hit

The top 6 recordings are being automatically made during a session (MapView are currently not used since there is no minimap in the experimental setup). To create Viewed houses and heatmap data open the Unity project 'DrawViewingPath', put in the VP number of the subject of interest into the respective field in the inspector and press play. After some calculation time you will be able to walk through the 3D city model and see all Gaze hit points. The two .txt files with the recordings have been created automatically. Additionally there are two checkboxes where you can pick a randomization (position or gaze randomization).

Matlab: (for new data format of Seahaven 2.0)

All important variables can be set on the top of each script. Outputs are automatically saved. Make sure to have all the files named in the column 'Input' in the folder which you access with the respective MATLAB script. If you don't have a certain input file you might have to run DrawViewingPath (explained above) or another MATLAB script first. Check the 'Output' column to see which output is created by which script.

Script	Input	Variables	Output
ValidationAnalysis	All Validation_VP#_Val#.txt files	<ul style="list-style-type: none"><li>• PartList: Which Subjects do you want to analyze</li><li>• NumVals: How many validations were doen for each subject</li><li>• Path: Where should results be saved</li></ul>	<ul style="list-style-type: none"><li>• ValidationStatsSJ.mat(table): For individual subjects</li><li>• OverallStats.mat<ul style="list-style-type: none"><li>• OverallMeanPoints(double)</li><li>• OverallMeanSubjects(double)</li><li>• OverallVariancePoints(double)</li></ul></li></ul>
PositionAnalysis	Positions_VP#.txt	<ul style="list-style-type: none"><li>• PartList</li><li>• sourcepath</li></ul>	<ul style="list-style-type: none"><li>• Map_VP_#.mat</li><li>• North_VP_#.mat</li><li>• Path_VP_#.mat</li></ul>
Analysis_Map	<ul style="list-style-type: none"><li>• Path_VP_#</li><li>• North_VP_#</li><li>• (map_VP_#)</li></ul>	<ul style="list-style-type: none"><li>• PartList</li><li>• savepath</li></ul>	<ul style="list-style-type: none"><li>• OverlaidMap.jpeg</li><li>• IndividualNorth.jpeg</li></ul>
Heatmap3D	3DHeatmap(RandomX)_VP#.txt	<ul style="list-style-type: none"><li>• VPNum</li><li>• Condition</li><li>• Savepath</li></ul>	<ul style="list-style-type: none"><li>• Heatmap (.jpeg)</li><li>• .mat file of x,y,d,c (c=density at point)</li></ul>

AnalyzeAllViews	ViewedHouses_VP	<ul style="list-style-type: none"> <li>• PartList</li> <li>• savepath</li> </ul>	<ul style="list-style-type: none"> <li>• TimeLine (.jpeg)</li> <li>• NumViewsD (.mat)</li> </ul>
Analysis_ViewedHouses	NumViewsD.mat	<ul style="list-style-type: none"> <li>• PartList</li> <li>• savepath</li> </ul>	<ul style="list-style-type: none"> <li>• TotalNum{VPRange}.mat</li> <li>• ViewingStats{VPRange}.mat</li> </ul>
GazeStandVSWalk	<ul style="list-style-type: none"> <li>• EyesOnScreen_VP#.txt</li> <li>• Positions_VP#.txt</li> </ul>	<ul style="list-style-type: none"> <li>• PartList</li> <li>• sourcepath</li> </ul>	<ul style="list-style-type: none"> <li>• GazeWalkStand{VPRange} (.jpeg)</li> <li>• Variances{VPRange} (.mat)</li> </ul>
LeftRightTurns	<ul style="list-style-type: none"> <li>• EyesOnScreen_VP#.txt</li> <li>• Positions_VP#.txt</li> </ul>	<ul style="list-style-type: none"> <li>• PartList</li> <li>• Sourcepath</li> <li>• IntervalLength</li> <li>• TurnSignificance</li> </ul>	<ul style="list-style-type: none"> <li>• GazeLeftRight{VPRange} (.jpeg)</li> <li>• TtestsLR{VPRange}.mat</li> </ul>
Entropy	• ViewedHouses_VP#	<ul style="list-style-type: none"> <li>• PartList</li> <li>• SourcPath</li> <li>• Intervalllength</li> </ul>	<ul style="list-style-type: none"> <li>• Entropy_IntervallLen_SJ#(.jpeg)</li> <li>• Entropy_IntervallLen_{VRRange}(.mat)</li> </ul>