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Houdini

Unit length = 1m

Unit mass = 1kg

Houdini Help pages



SCENEVIEW SHORTCUTS			
TOOLS			
	Select	s	
	Move	t	
	Rotate	r	
	Scale	e	
	Animate	Ctrl-R	
	Show Handle	Enter	
	View	Esc	
	Tool Menu	Tab	
	Custom Radial Menu	c	
	Repeat Last Tool	q	
VIEW			
	Tumble	Space/Alt + LMB	
	Track	Space/Alt + MMB	
	Dolly	Space/Alt + RMB	
	Home Grid	Space + h	
	Home All	Space + a	
	Home Selected	Space + g	
VIEW RADIAL MENU			
	Selection Tools	v ⇨ □	
	Selection Options	v ⇨ □	
	Viewport	v ⇨ □	
	Shading	v ⇨ □	
SELECTION MODES			
	Objects	1	
	Points	2	
	Edges	3	
	Primitives (Faces)	4	
	Vertices	5	
	Select Groups/Connected Geometry	9	
	Toggle Objects/Geometry	F8	
SELECTING			
	Select	LMB	
	Add to Selection	Shift + LMB	
	Remove from Selection	Ctrl + LMB	
	Toggle Selection	Ctrl + Shift + LMB	
	Select All/None [OBJ]	a/n	
	Select All/None [SOP]	n/Shift-n	
SNAPPING RADIAL MENU			
	Grid Snap	x ⇨ □	
	Primitive (Curve) Snap	x ⇨ □	
	Point Snap	x ⇨ □	
	Multi-Snapping Snap	x ⇨ □	
VIEWPORTS			
	Expand Viewport	Space + b	
	Select Viewport	Space + n	
	Perspective View	Space + 1	
	Top/Bottom View	Space + 2	
	Front/Back View	Space + 3	
	Right/Left View	Space + 4	
	UV View	Space + 5	
	Toggle Wireframe/Shaded	w	
	Display Options	d	
VIEWPORT LAYOUT			
	Single View	Ctrl + 1	
	Two Views Side by Side	Ctrl + 2	
	Three Views Split Left	Ctrl + 3	
	Four Views	Ctrl + 4	

NETWORK VIEW SHORTCUTS			
VIEW			
	Pan	Space+ LMB or MMB	
	Zoom	Space+ RMB or Scroll Wheel	
	Show all Nodes	h	
	Show Selected Nodes	g	
CREATE			
	Node Menu	Tab	
	Add File Node	=	
	Create Subnet	Shift + c	
	Add/Edit Background Images	Shift - i	
NOTES AND NETWORK BOXES			
	Add Network Box	Shift + o	
	Add Sticky	Shift - p	
	Minimize Selected Notes/Boxes	Shift - j	
	Expand Selected Notes/Boxes	Shift - k	
	Shrink box to fit contents	Shift - m	
WIRING			
	Connect Nodes	LMB on Connector	
	Connect Multiple Nodes	J drag over nodes	
	Insert Node	RMB on Connector	
	Cut Wire	Y drag across wire	
	Disconnect from Wires	Shake Node	
DOTS			
	Add Dot	Alt + LMB on wire	
	Pin/Unpin Dot	Alt + LMB on dot	
TOOLS			
	Toggle Parameter Pane	p	
	Toggle Tree View	Shift + w	
	Toggle Network Overview	o	
	Toggle Color Palette	c	
	Toggle Shape Palette	z	
CLICKS AND DRAGS			
	Select	LMB	
	Add to Selection	Shift + LMB	
	Remove from Selection	Ctrl + LMB	
	Start Wiring from Node	Alt + LMB	
	Select Node + Inputs	Alt + Shift + LMB	
	Select Node + Output	Alt + Ctrl + LMB	
	Select Inputs + Outputs	Alt + Shift + Ctrl + LMB	
	Move Node	LMB-Drag	
	Move Node + Inputs	Shift + LMB-Drag	
	Move Node + Outputs	Ctrl + LMB-Drag	
	Copy Selected Nodes	Alt + LMB-Drag	
	Copy Node + Inputs	Alt + Shift + LMB-Drag	
	Copy Node + Output	Alt + Ctrl + LMB-Drag	
	Reference Copy	Alt + Shift + Ctrl + LMB-Drag	
NAVIGATION			
	Enter a Node	Double-click or Enter or i	
	Go up a level	u	
	Radial Menu	n	
	Create a Quickmark	Ctrl + <# 1-5>	
	Go to a Quickmark	Shift + <# 1-5>	
	Go to Previous View	` (Backtick)	
	Select the Node Upstream	PgUp	
	Select the Node Downstream	PgDn	
	Select Previous Sibling	Shift + PgUp	
	Select Next Sibling	Shift + PgDn	
ORGANIZE NODES			
	Layout all	L	
	Align	a + LMB-Drag Down/Across	
DISPLAY FLAGS SOP LEVEL			
	Render	t + LMB	
	Display	r + LMB	
	Template	e + LMB	
	Selectable Template	w + LMB	
	Bypass	q or b + LMB	

vex functions

Handy Nodes

geo
 Assemble
 Connectadjacentpieces
 Peak
 Creep

Good to know

A dotted line means that it's referencing a certain node (so for example, no extra particles will be added(check with the middle mouse))

Shortcuts

Navigation

Action	Shortcut
Toggle render view	Shift r
Split window	Alt [
Split window	Alt]
Close window	Ctrl w
Dashbox	Ctrl d
Focus	Ctrl Alt s

Viewport

Action	Shortcut
Create	c
View mode	v
Select everything	n
Toggle quad view (orthographic and perspective)	b
Selection group	Enter 9

Network editor

Network editor

Action	Shortcut
Group nodes	shift z
Merge nodes	shift click multiple outputs, alt click to merge
Switch between workspaces	n
Create duplicate	Alt-drag
Create referenced duplicate	Ctrl-Shift-Alt-drag

Action	Shortcut
Switch input wires around	Shift R
Connect nodes with drawn line	hold J
Organizing	
Notepad	Shift p
Underlay	Shift o
Line out	l
Wiring style	Shift s
Create re-route	hold Alt
Align selected nodes	Shift a

MPlay

Action	Shortcut
list shots	Alt l

Task Operators

Action	Shortcut
Cook node	Shift g
Dirty node	Shift d
Dirty and Cook node	Shift v

General

Action	Shortcut
Switch inputs	Shift r
Select	s
Scale	e
Rotate	r
Translate	t
Handles Tool	Enter
View mode	Spacebar
Snaping pie menu	x
Wire only	q
Wire over shaded	Shift w
Parameters	p
Cut wires	y
Enlarge parameter box	Ctrl e
Color nodes	c
Perspective	Spacebar 1
Front	spacebar 3
Sticky note	shift p
Network overview	o
Go up in node hierarchy	u
Clean up the network/layout all	l

Action	Shortcut
Full screen	ctrl b
Focus on object	ctrl click on geometry
Zoom in/out	alt right mouseclick
Graph editor	v
Network Box	shift o
Change node shape	z
Home	g
Display options	d (In viewport)
Transformation mode	m
Render selection view	Shift drag
Place key	Alt click
Remove key	Ctrl click
Open external (word/VEX) editor	Alt e
Split viewport	space b
Grow selection	Shift g
Shrink selection	Shift s
Make font bigger	Ctrl +
Make font smaller	Ctrl -

Different types of context

Object = Object type nodes in an Object type folder. These Object nodes allow you to build transform constraint hierarchies. Geometry type Object nodes contain SOP nodes that construct and modify geometry that inherits any transforms at the object level.

SOPs = Surface OPerators or geometry nodes that are inside an object folder. These are used to construct and modify geometry. Any kind of geometry from polygons to volumes.

DOPs = Dynamic OPerators or simulation/solver nodes that are used to construct simulations. Simulations read in geometry from SOPs and pass this data into the DOP solvers.

SHOP = SHading Operators are materials that represent a shader to apply to geometry. Some are hard-coded with vex and others are folders that you can dive in to and modify the VOPs inside.

VEX = Vector Expression Language, a custom language loosely based on the C language, but takes ideas from C++ as well as the RenderMan shading language. VEX is not an alternative to scripting, but rather a smaller, more efficient general purpose language for writing shaders and custom nodes. VOPs are wrappers around VEX code snippets.

VOPs = Vector OPerators inside VOP network nodes are used for everything from building shaders to modifying geometry, volumes, pixels, and more.

CVEX = Context agnostic Vector Expression Language. This has replaced all the VEX specific contexts throughout Houdini. It is a generalized language that uses the same environment and functions anywhere inside Houdini.

COPs = Composite OPerators in composite type folders. Used in image compositing operations.

ROPs = Render OPERators in side ROP Output directories that are used to create render output dependency graphs for automating output of any type of data and for triggering external processes like rendering. Commonly used to generate sequences of geometry, simulation data and trigger Render tasks that generate sequences of images to disk.

CHOPs = CHannel OPERators used to create and modify any type of raw channel data from motion to audio and everything in between. Most users safely ignore the CHOP context, and so can you, for now. Put it on the “get to it later” list when learning Houdini. But definitely keep it on the list.

Add-on's

Name	Description
Supercharged R7	GUI & Workflow Enhancements
MLOPs	Machine Learning Plugin for Houdini
GSOPs	Gaussian splatting in Houdini
Modeler	Designed for fast and intuitive creation and editing of polygonal and subdivision meshes
SDFM	A free, open source SDF Modeling Toolset for Houdini

HDAs/OTLs

Operator Type Library (or Houdini Digital Asset library)

Link	Description
qLib	A collection of tools
BoomBox	Fracturing and art directing RBD sims
Wrinkle Deformer	OpenCL wrinkle deformer
Auto Rig Lite	Auto Rigger
BoxCutter	BoxCutter Demo Houdini
DASH	Quality of Life utilities package
IPOPs	Geometry AOVs for Karma CPU & XPU
Asset Handler	Generate HDA's with thumbnails & copy external files
Material builder	

Manual changes

General

First, download [ImageMagick](#)

In C:\Users\flori\Documents\houdini20.0\houdini.env file, add

```
PDG_IMAGEMAGIC = "C:\Program Files\ImageMagick-7.1.1-Q16-HDRI\magick.exe"
PDG_FFMPEG = "C:\Program Files\ImageMagick-7.1.1-Q16-HDRI\ffmpeg.exe"
```

Python

[Houdini shelf tool for fast theme switch](#)
[TextToMtlX](#)

Expression functions

[centroid\(surface_node, type\)](#)
[detail\(surface_node, attrib_name, attrib_index\)](#)

VEX

Remove Points by ID

```
if (rand(@id*ch('seed'))>chf('ratio'))
{
    removepoint(0,@ptnum);
}
```

Create vector based on relative location from point 2nd input

```
vector a = point(0, "P", @ptnum);
vector b = point(1, "P", 0);
@v = (a-b);
@v *= chf("mult");
```

Point normals outward

```
vector a = set(0,0,0);
@N = normalize(a + @P);
```

Change particle size in LOP's

In Primitive, select "All Geometry Primitives"

Also tick on "Run on Elements of Array Attributes"

```
@widths = ch("pscale_mult");
```

Links

Premium

- [Houdini School](#)
- [Theory accelerated](#)
- [Particles](#)

- [Rohan Dalvi](#)

Vex

- [VEX-snippets](#)
- [JoyOfVex](#)
- [VEX for artists](#)

General

- [CG Wiki](#)
- [Houdini Resources](#)
- [The Vault Manual](#)
- [Applied Houdini](#)
- [HoudiniSimon](#)
- [Nick Taylor](#)
- [Houdini Blueprints](#)
- [Convert hipnc to hip files](#)
- [Getting Started With Houdini](#)
- [Nitzan Tregerman](#)
- [Jake Rice Blog](#)
- [TOPs](#)
- [Blooming flowers](#)
- [Simulate Paint Smearing](#)
- [Unwrapping](#)
- [Pixelfondue](#)
- [Konstantin Magnus](#)
- [Andreas Kjær-Jensen](#)
- [Creating an CGI Crystal](#)
- [Using op-expressions for more efficient workflows](#)

FX

- [Creating Lightning with VEX](#)

Terrain

- [Labs project Dryad Biomes](#)
- [Terrain Handbook](#)
- [Procedural Rocks](#)
- [Integrating a Road into a Heightfield](#)
- [Project Pegasus](#)
- [Procedural racetrack tool](#)

Volumes

- [Intro to Houdini Volumes, Clouds, and Volume VOPs](#)

Rigging

- [Spiral skinning](#)
- [Rig fur dude with KineFX](#)
- [Apex rig](#)
- [Generating folder structures](#)
- [Process Multiple Objects with TOPS](#)
- [2D animation](#)
- [Animating Characters](#)

Programming

- [How not to suck at Python](#)
- [Extending Houdini with C++](#)

DemoScenes/HDA's

- [richlord](#)
- [superphotoreal.gumroad](#)
- [Examples of Neural Networks built with VEX](#)

CHOPs/Touchdesigner

- [What I Found](#)

SOPs

- [SOP Quicktips](#)
- [PathSequencer - The Easiest Way to Instance & Retime](#)

COPs

- [COP Quicktips](#)
- [Crystal Fluorite in Houdini 20.5](#)
- [How to Create Organic Textures](#)
- [SOPs to COPs to Karma](#)
- [Draw geo and material modification](#)

TOPs

- [Product Proceduralization *](#)
- [TOPs Masterclass](#)

LOPs

- [Solar Eclipse](#)
- [MultiShot Workflows](#)
- [Intro to Solaris](#)

UI

- [John Kunz UI Customizations for Houdini 19](#)

Pipeline

- [Houdini Companion -HtoolsQS](#)

Files in the packages folder

Preferences

```
{
  "env": [
    {
      "HOUDINI_USER_PREF_DIR": "P:/Houdini__HVER__"
    },
    {
      "HSITE": "P:/Houdini"
    },
    {
      "HOUDINI_DESK_PATH": "P:/Houdini/desktop"
    }
  ]
}
```

Imagemagick

First, download [ImageMagick](#)

In C:\Users\flori\Documents\houdini20.0\houdini.env file, add

```
{
  "env": [
    {
      "PDG_IMAGEMAGIC": "C:\Program Files\ImageMagick-7.1.1-Q16-
```

```
HDRI\magick.exe"  
    },  
    {  
        "PDG_FFMPEG": "C:\Program Files\ImageMagick-7.1.1-Q16-  
HDRI\ffmpeg.exe"  
    },  
]  
}
```

[Houdini.env \\$HOME Houdini Environment Setup Houdini Setup HSITE](#)

Assets

[Megascans Karma USD](#)

From:

<https://floriandheer.com/brainii/> - **Brain II**

Permanent link:

https://floriandheer.com/brainii/doku.php?id=start:knowledge:software:houdini_knowledge

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