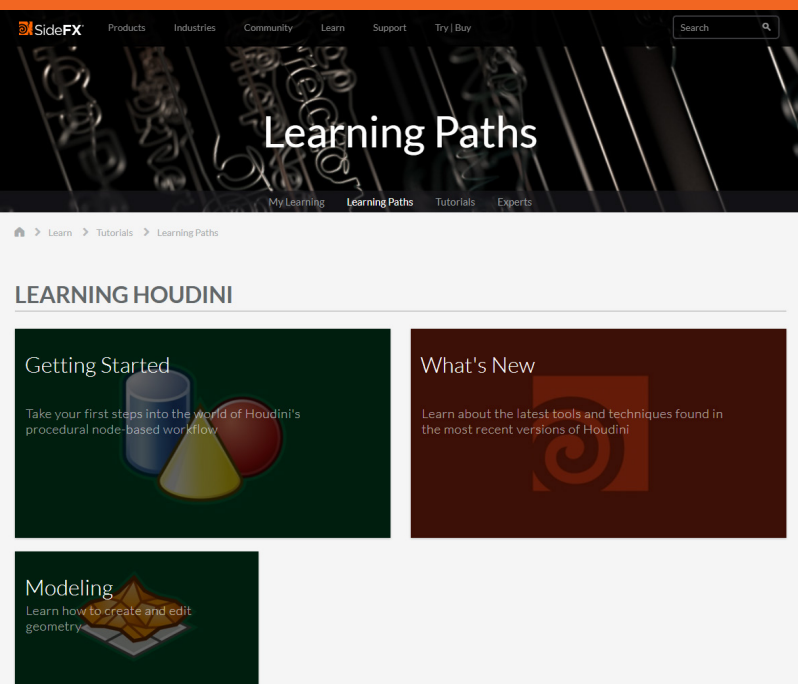


HOUDINI EXAM STUDY GUIDE

what to know & where to find it

Houdini[™]
EDUCATION





OVERVIEW

It is expected that all candidates for the exam have a strong familiarity with Houdini, and a working knowledge of computer graphics theory and implementation. The online proctored exam consists of 60 questions. Each exam candidate is allotted 90 minutes to complete their exam. The exam is delivered online through the Certiverse platform and requires each applicant to schedule a time to take their exam.

The Houdini Generalist Exam demonstrates and validates the competent skills needed for success as a Houdini user. A candidate for the Houdini Generalist Exam is an intermediate-level Houdini user with a comparable skill set of 3-5 years of industry experience using Houdini in a professional setting (i.e. in VFX, Games, Art installation, Universities, etc.).

Candidates should possess a general understanding of how Houdini is implemented in a professional environment and basic system administration. They should have an understanding of the underlying principles of Houdini and a general idea of proceduralism as it's presented in Houdini. It is expected that all candidates for the exam have a strong familiarity with Houdini as well as a working knowledge of computer graphics theory and implementation.

This document provides information about some of the resources applicants will find useful as they prepare for the Houdini Generalist Exam.

TOPIC OUTLINE

The following list contains some of the topics and software features that may be included in the exam:



General – range of topics from UI/UX to the Licensing system used in Houdini. These topics are crucial to productive and effective work within the Houdini environment.

- Houdini Concepts
- UI / UX
- Pipeline
- Optimization
- Licensing
- Houdini Environment



OBJ – concepts like transformations and parenting objects, geometry objects, lighting, and cameras.



SOPs – generating and manipulating geometry and creating attributes.

- Geometry
- Modeling
- Attributes



LOPs/USD – workflows for lighting, camera manipulation, shading, rendering, and USD.

- Cameras
- Shading
- Lighting
- Rendering



COPs – Copernicus context, or COPs. Topics will touch on foundational image manipulation nodes, basic texture synthesis, and the 3D nature of COPs.



TOPs – automating parallel processes within Houdini, the unique UI of this context, running processes on a local machine, or a server farm.



Dynamics/Simulation – Conceptual questions about how these different types of simulations work, ways to optimize or improve the results of a simulation, or simply the purpose of key nodes.

- RBD
- Pyro
- FLIP
- Crowd
- POPs
- Vellum



Scripting –VOPs, VEX, and Python. The function of certain nodes in VOPs, conceptual ideas about how the nodes are compiled into VEX code, high level concepts of using Python, and practical use cases for using VEX and Python.



HDA / Tool Development – the details of writing HDAs to disk and the basic technical skills needed to successfully share tools with other DCCs/artists.



Animation – KineFX workflows and procedural animation with CHOPs. KineFX questions will focus on its core concepts of skeleton building, binding meshes to the skeleton, and manipulating the joints as points. CHOPs questions will focus more on what nodes would help you achieve specific results.



Grooming – hair, fur, feathers, and the common ways that they are manipulated to create a character's groom.



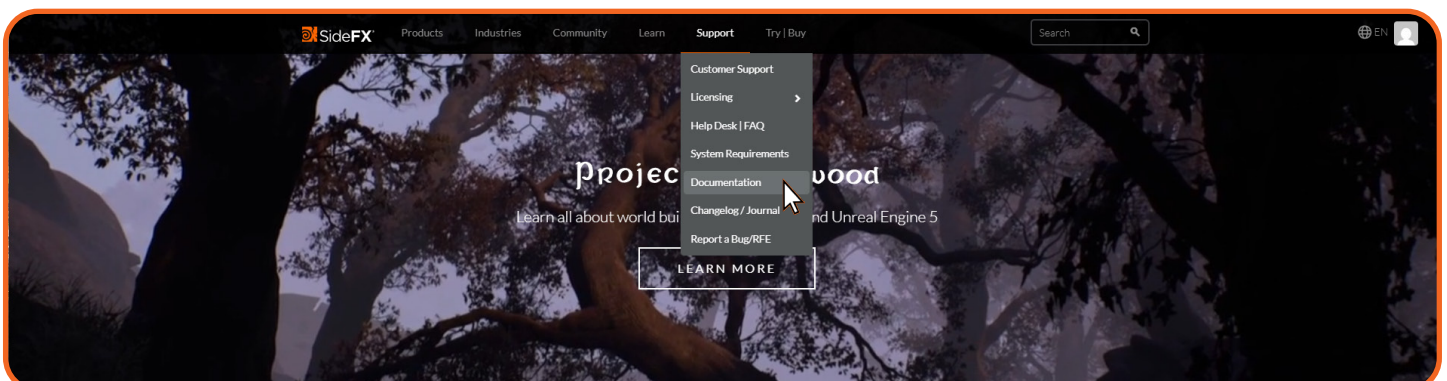
Realtime / Game Engine – Houdini's use within realtime game engines; transferring data in/out of Houdini, using HDAs, or general conceptual considerations when bringing Houdini data over to a game engine.

GUIDE TO STUDY MATERIAL

documentation

In addition to node specific help cards, the documentation provided within Houdini and on the SideFX website contain a number of 'overview' pages that summarize a topic at a high level and convey broad concepts that help users gain a better understanding of principles and terminology, then guide the user to more specific information. In the following example we see the Overview page for Feathers, as well as links to more detailed information on the topic.

[sidefx.com](https://www.sidefx.com) >



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HOUDINI DOCUMENTATION

When you install Houdini, you also install online help that includes documentation and a library of example files which are used to illustrate key tools and techniques. If you choose to not install this material, you can access the docs (but not the example files) using the links shown below.

[Houdini 20.5](#)
[Houdini 20.0](#)
[Houdini 19.5](#)

[Houdini 19.0](#)
[Houdini 18.5](#)

Select the version applicable to you

GETTING STARTED

[What's new in Houdini 21](#)
New features and changes in Houdini 21

[Installation and Licensing](#)
Installation and Licensing guide.

[Basics](#)
The basics of working with Houdini's user interface.

[Shelf tools](#)
How to use and customize the icons on the shelf at the top of the main window.

[Networks and parameters](#)
How to use the network and parameter editors to work in Houdini.

[Examples](#)
Example files showing how different nodes work.

[How to use the help](#)
How to use the online help and document your own tools.

NODES

[OBJ - Object nodes](#)
Object nodes represent objects in the scene, such as character parts, geometry objects, lights, cameras, and so on.

[SOP - Geometry nodes](#)
Geometry nodes live inside Geo objects and generate geometry.

[DOP - Dynamics nodes](#)
Dynamics nodes set up the conditions and rules for dynamics simulations.

[VOP - Shader nodes](#)
VOP nodes let you define a program (such as a shader) by connecting nodes together. Houdini then compiles the node network into executable VEX code.

[LOP - USD nodes](#)
LOP nodes generate USD describing characters, props, lighting, and rendering.

[ROP - Render nodes](#)
Render nodes either render the scene or set up render dependency networks.

[CHOP - Channel nodes](#)
Channel nodes create, filter, and manipulate channel data.

[COP - Copernicus nodes](#)
COP nodes provide real-time image manipulation within a 3D scene.

Select a topic

Houdini 21.0

- GETTING STARTED
 - [What's new in Houdini 21](#)
 - [Installation and Licensing](#)
 - [Basics](#)
 - [Shelf tools](#)
 - [Networks and parameters](#)
 - [Examples](#)
 - [How to use the help](#)
- USING HOUDINI
 - [Geometry](#)
 - [Copying and instancing](#)
 - [Heightfields and terrains](#)
 - [Animation](#)
 - [Digital assets](#)
 - [Import and export](#)
 - [NPlay viewer](#)
- CHARACTER FX
 - [Character](#)
 - [Crowd simulations](#)
 - [Muscles and tissue](#)
 - [Hair and fur](#)
 - [Feathers](#)
- DYNAMICS
 - [Dynamics](#)
 - [Vellum](#)
 - [Pyro](#)
 - [Fluids](#)
 - [Oceans and water surfaces](#)
 - [NPM](#)
 - [Destruction](#)
 - [Grains](#)
 - [Stylized](#)

Houdini 21.0 > Feathers

How to create highly realistic and detailed feathers for your characters.

On this page

- [Feather facts](#)
- [Feather parts](#)
- [Feather types](#)
- [Feather colors](#)
- [Subtopics](#)

Image courtesy of Andriy Bilichenko.

Feathers in CGI are one of the most challenging tasks. You have to deal with large amounts of data, very different structures and - depending on the camera's point of view - lots of detail. Of course, you also need strategies for the interaction between the feathers themselves, but also between feathers and character, as well as the surrounding environment, e.g. wind. Furthermore, you want full artistic control over the feather's look and shape and the entire groom. Brushes, masks, paint tools, and the possibility to modify each feather at any point of your network are also important requirements for a professional and artist-friendly feather system. Last, but not least, you also

Houdini 21.0

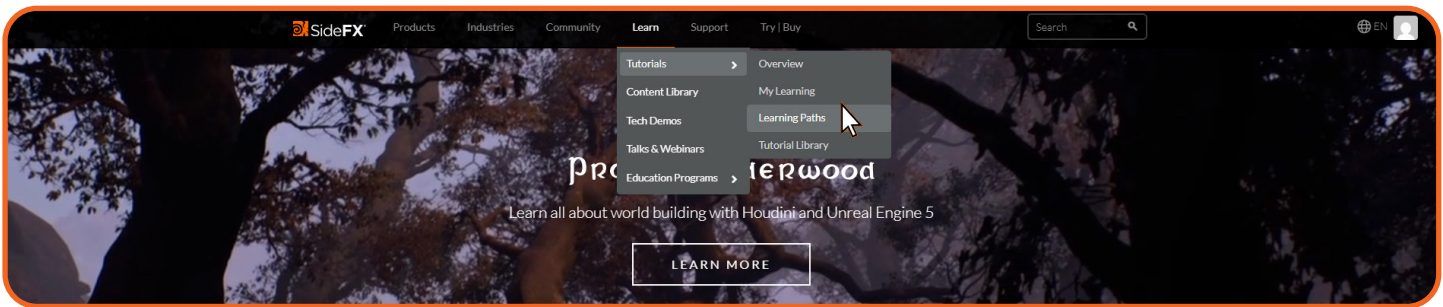
- GETTING STARTED
 - [What's new in Houdini 21](#)
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SUBTOPICS

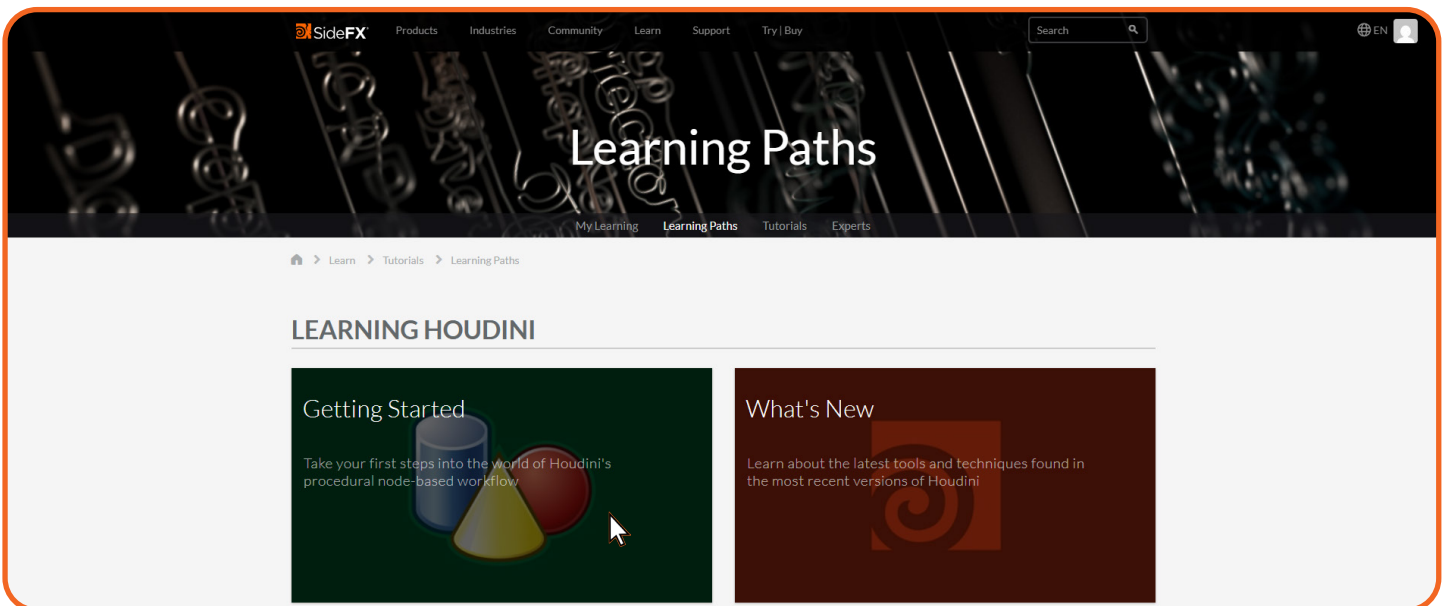
- BASIC SETUP
 - [Feather concepts](#)
- DRAWING AND SHAPING
 - [Drawing feathers](#)
 - [Feather naming](#)
 - [Feather attributes and groups](#)
 - [Feather clumping](#)
 - [Guide processing and noise](#)
 - [Feather blending](#)
 - [Accessing feather components](#)
 - [Down design](#)
 - [Painting](#)
 - [Creating a feather atlas](#)

See subtopics at the bottom of the page

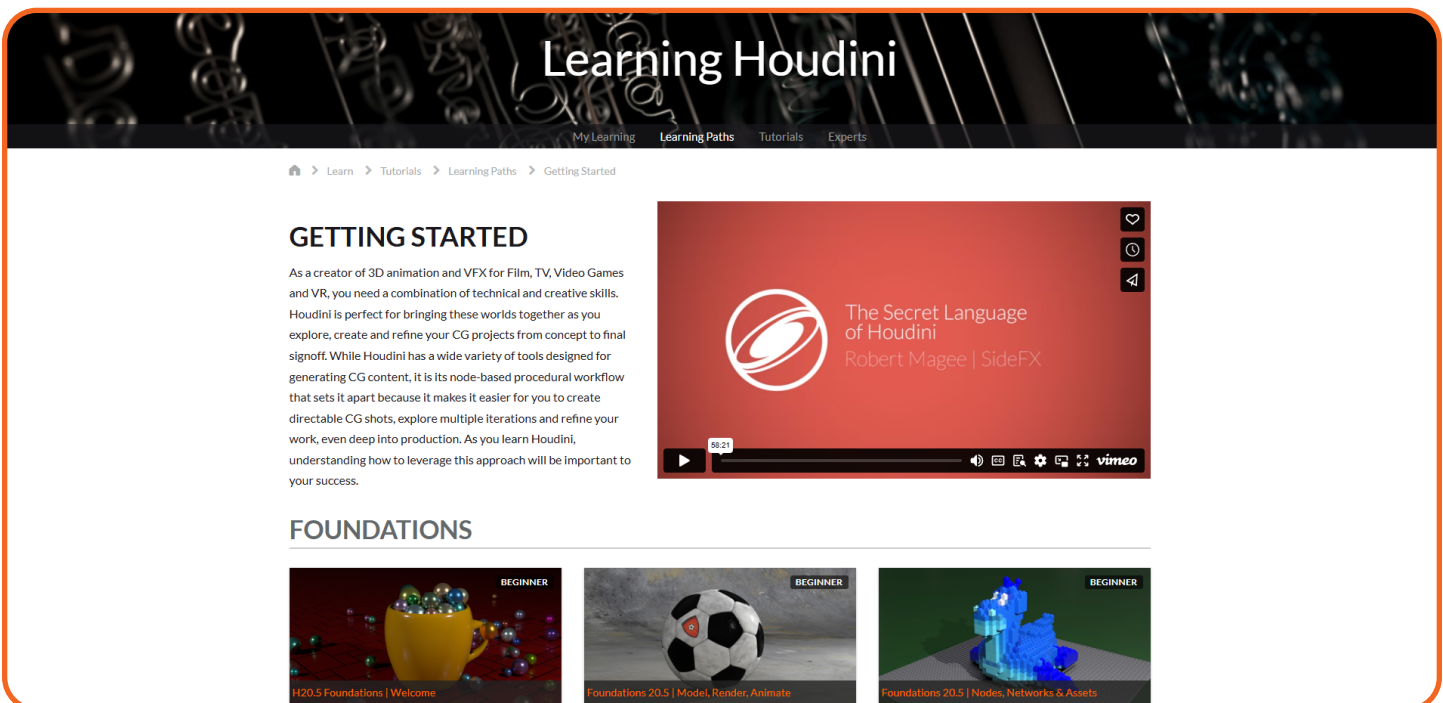
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Hover over the Learn tab, then Tutorials, and click Learning Paths.



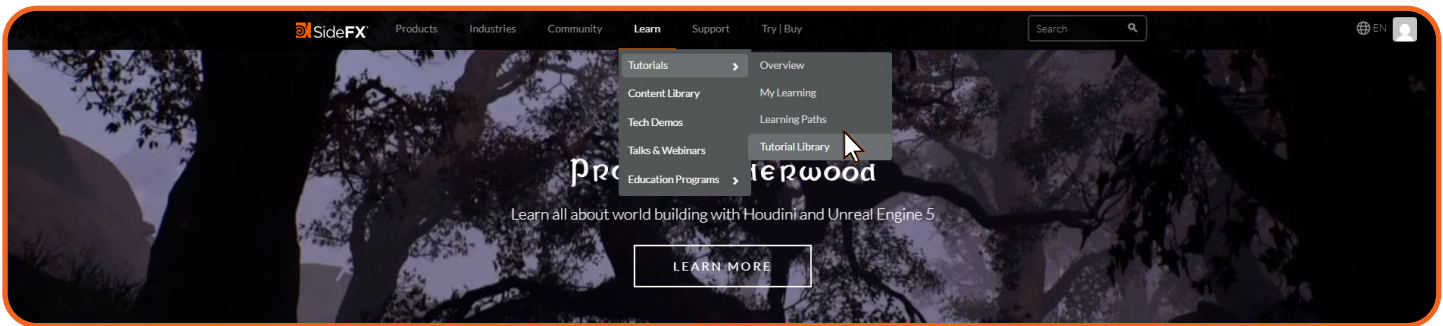
On the Learning Paths page, click on Getting Started.



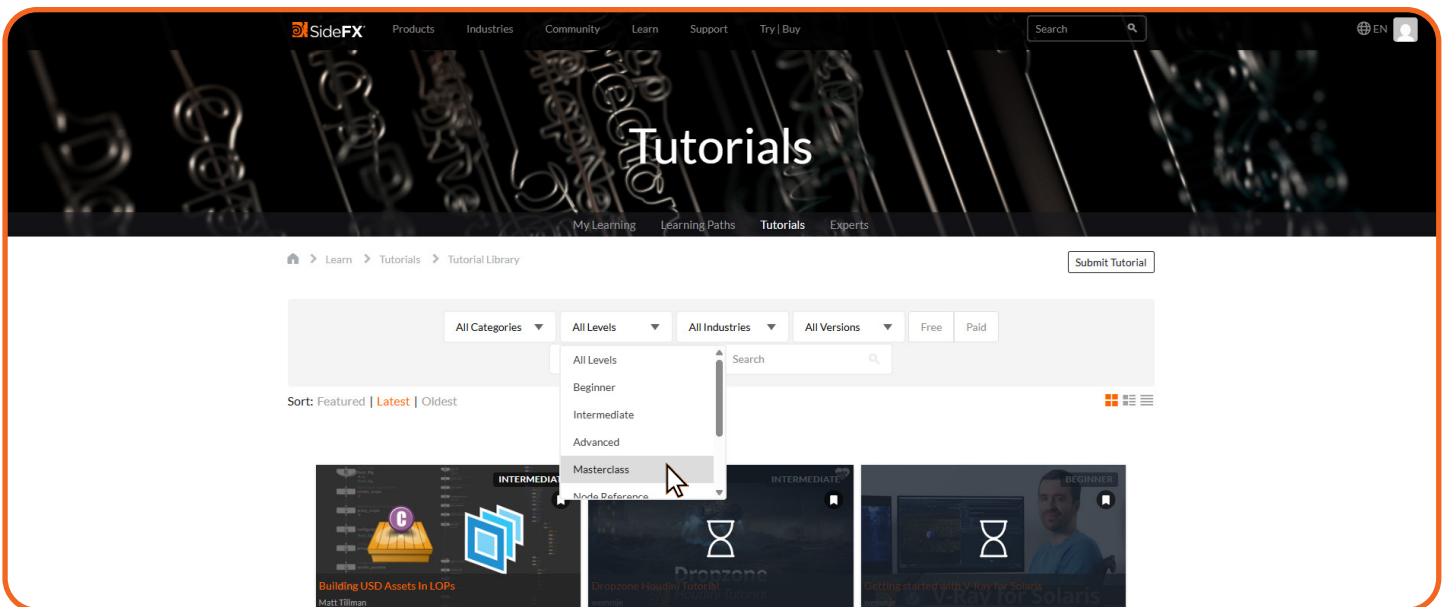
The Foundations series can be found on this page. Click any of the videos to begin.

masterclasses

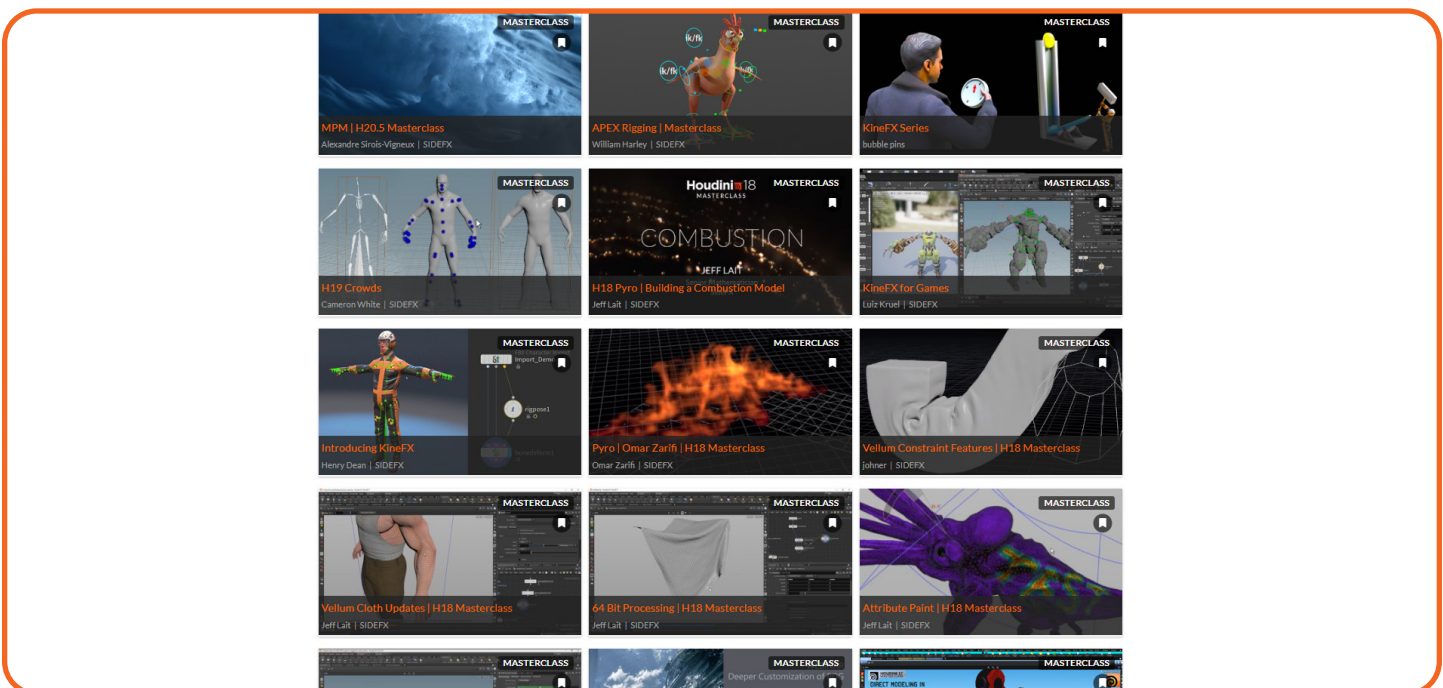
sidefx.com >



Hover over the Learn tab, then Tutorials, and click Tutorial Library.



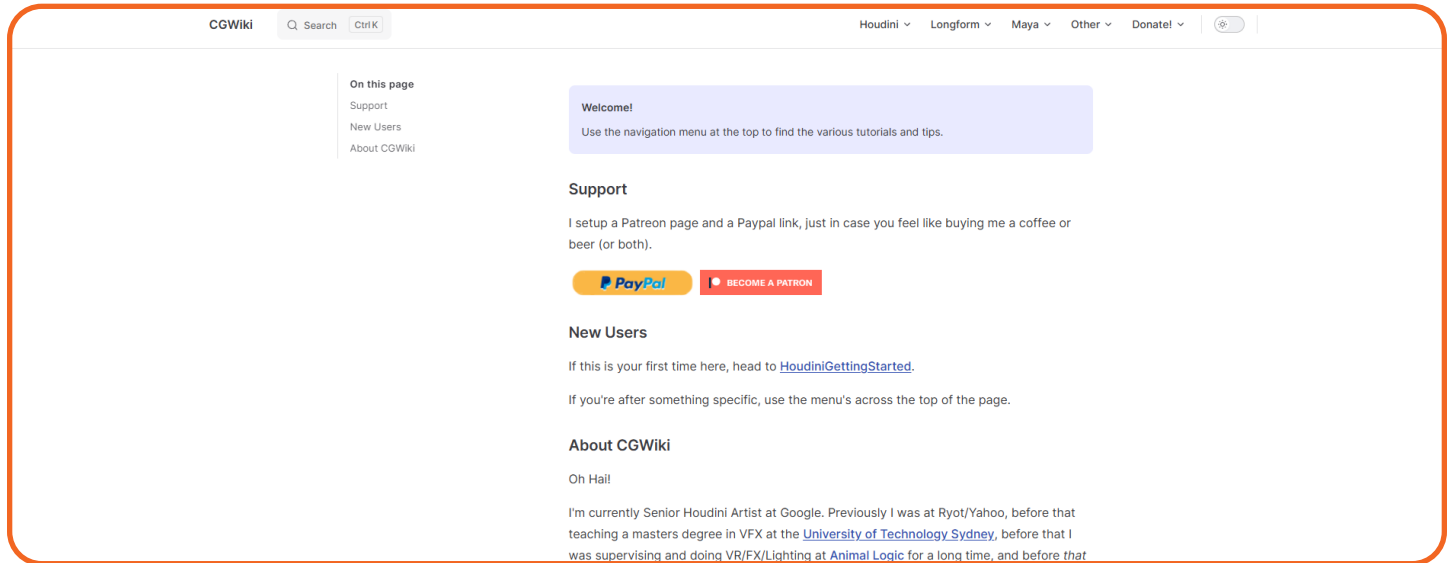
On the Tutorials page, click on the All Levels dropdown to switch it to Masterclass.



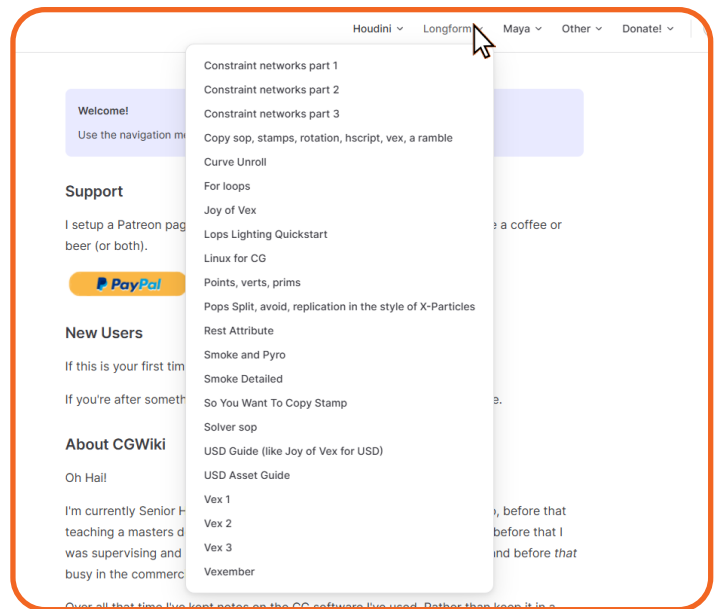
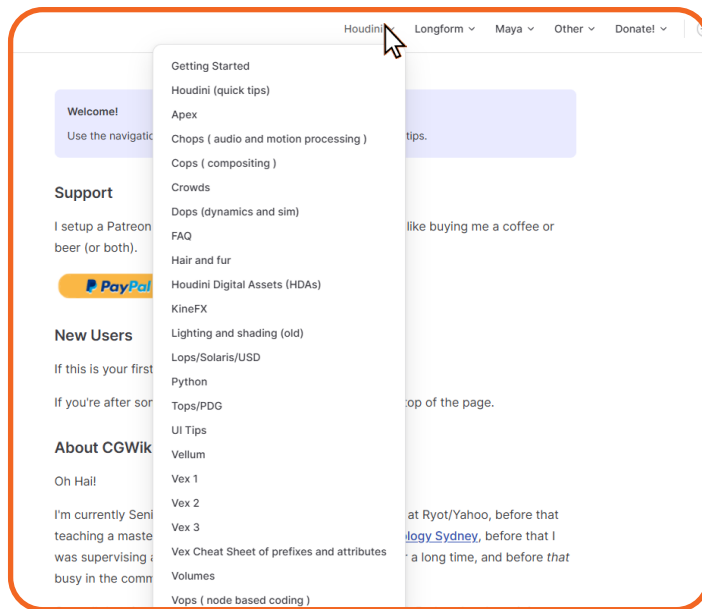
Now only masterclasses are listed. Click on any video to get started.

Houdini artist and educator Matt Estela keeps an updated personal notebook on the CG software he uses, and that wealth of knowledge has been offered to the public as CGWiki.

tokenr.com/cgwiki >



At the top of the page, hover over the Houdini and Longform tabs to view different topics.



As a qualified Houdini Instructor, you have the ability to show potential employers, students and learners that you have the skills and knowledge to teach Houdini at various levels of competency, from beginner learners to experienced users. Using this study guide, candidates should have all the resources needed to be successful in completing the Houdini Generalist Exam.

