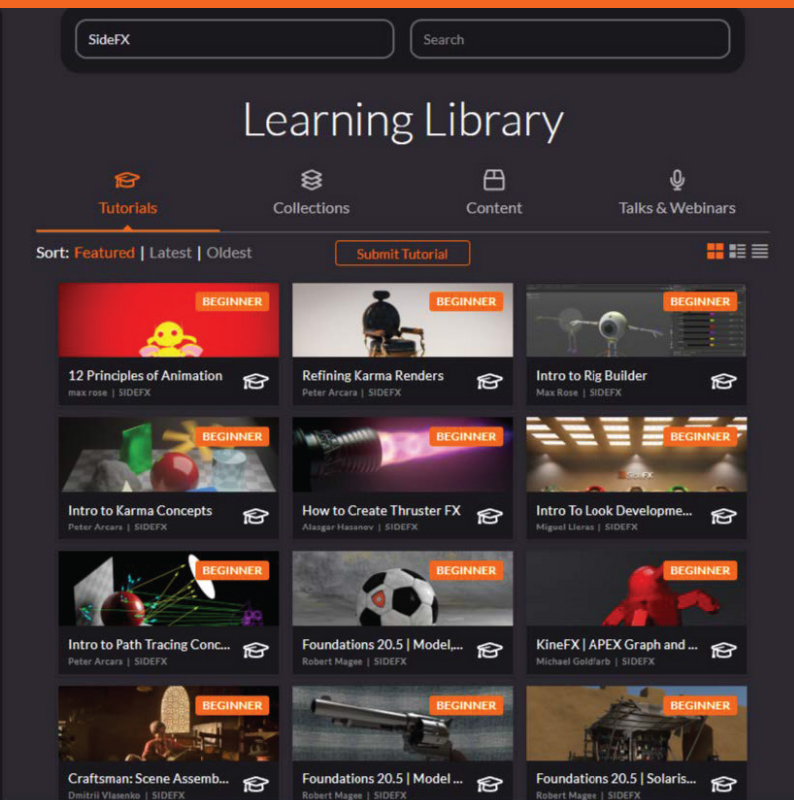


Houdini™

**CERTIFICATION
EXAM
STUDY GUIDE**

what to know & where to find it





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 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 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.



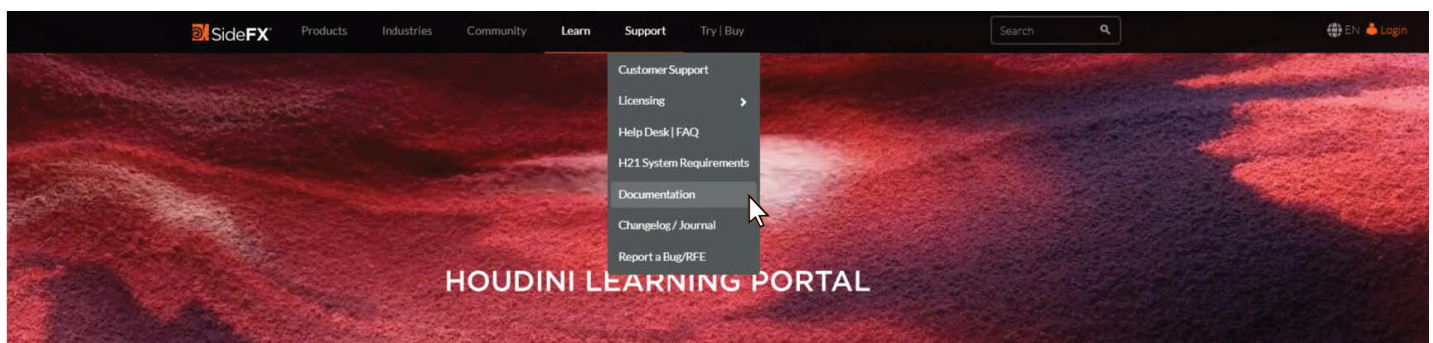
Realtime / Game Engine – Houdini's use within realtime game engines; transferring data in/out of Houdini, using HDAs, or general conceptual considerations when bringing Houdini data over to a game engine.

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) >



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, then you can access the docs (but not the example files) using the links shown below.

[Houdini 21.0](#)
[Houdini 19.5](#)



[Houdini 20.5](#)
[Houdini 19.0](#)

[Houdini 20.0](#)

Select the version applicable to you

HOUDINI help 21.0⁷³⁶

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.

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

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
- MPlay viewer

CHARACTER FX

- Character
- Crowd simulations
- Muscles and tissue
- Hair and fur
- Feathers

DYNAMICS

- Dynamics
- Vellum
- Pyro
- Fluids
- Oceans and water surfaces
- MPM
- 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

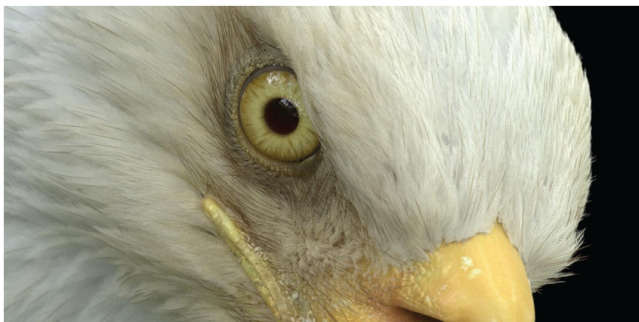


Image courtesy of Andriy Bilichenko.

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
- 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

SUBTOPICS

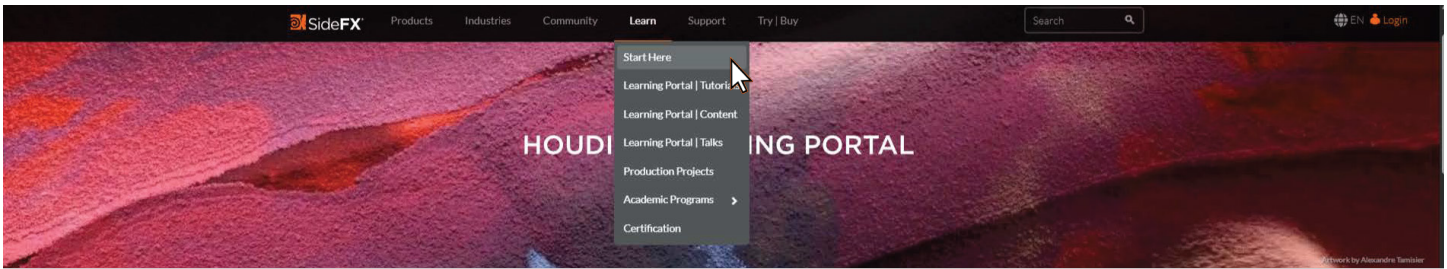
BASIC SETUP

Feather concepts

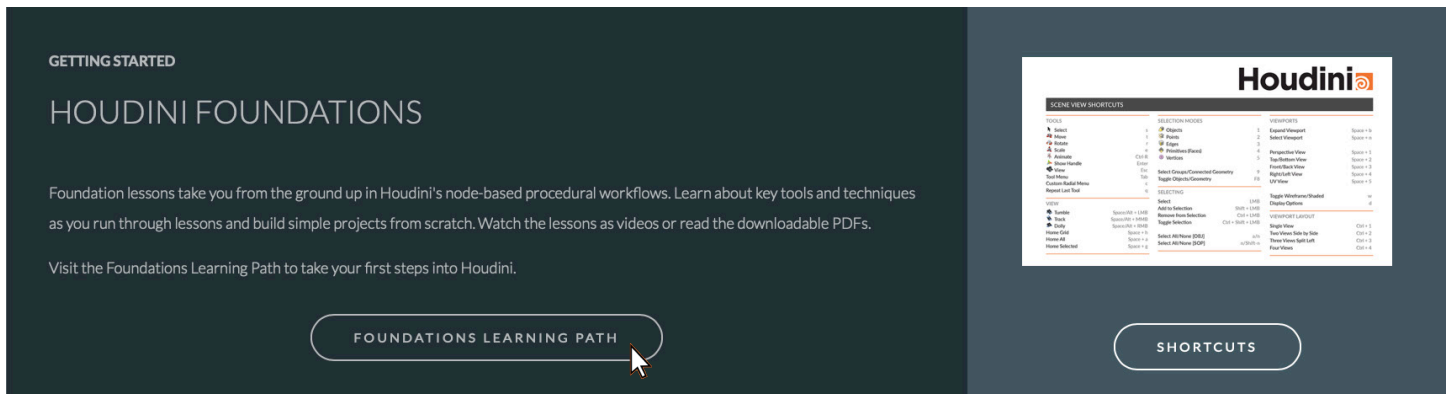
DRAWING AND SHAPING

- 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

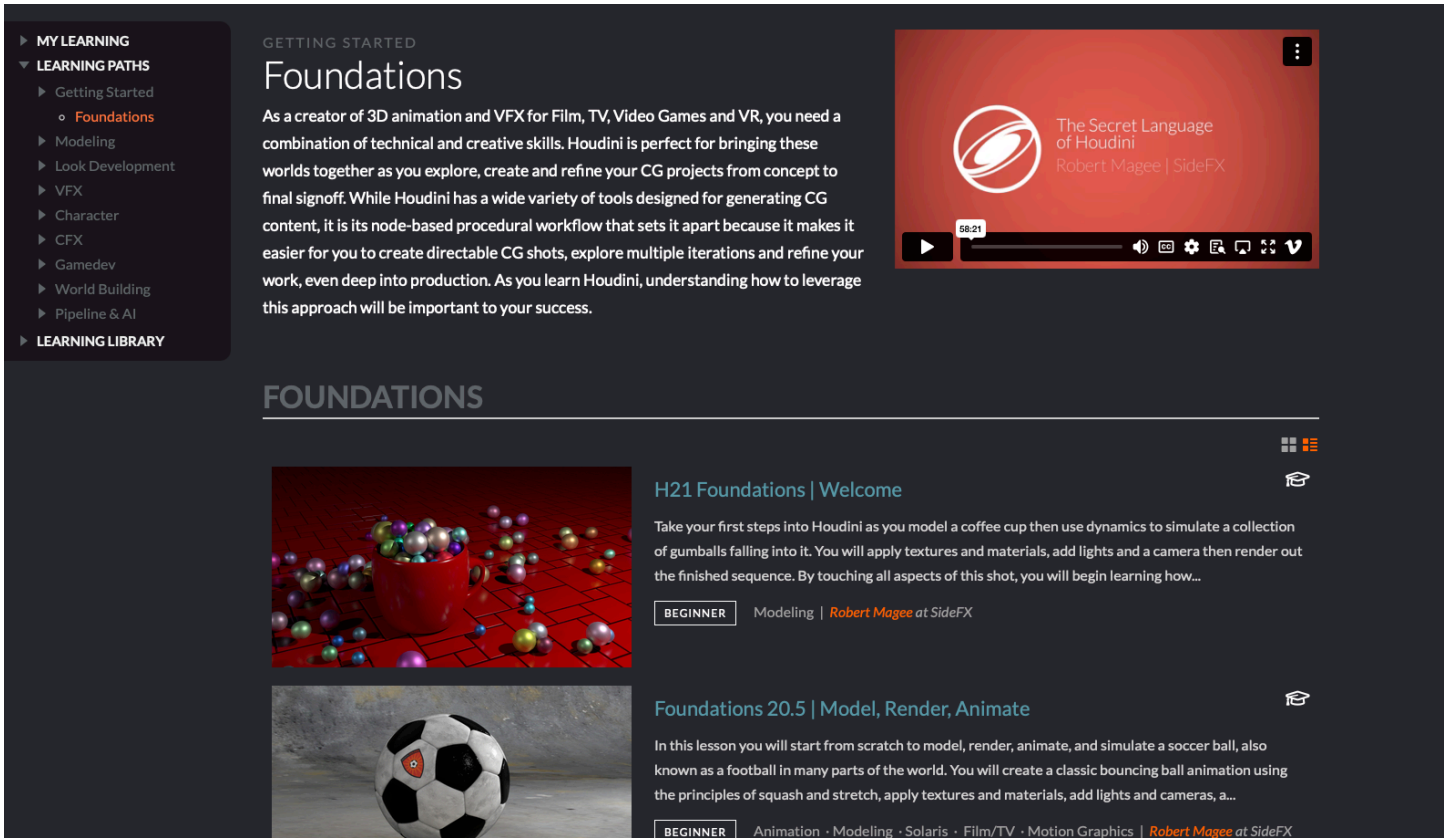
See subtopics at the bottom of the page



Hover over the Learn tab, then select Start Here. Scroll down and click on Foundations Learning Path.



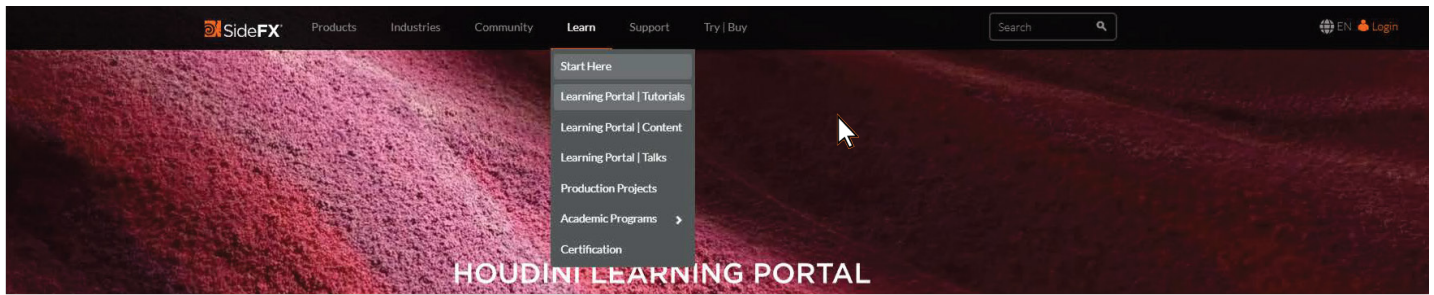
On the Foundations Learning Paths page, click on Getting Started.



Click on H21 Foundations | Welcome to start your first lesson.

Learning Library

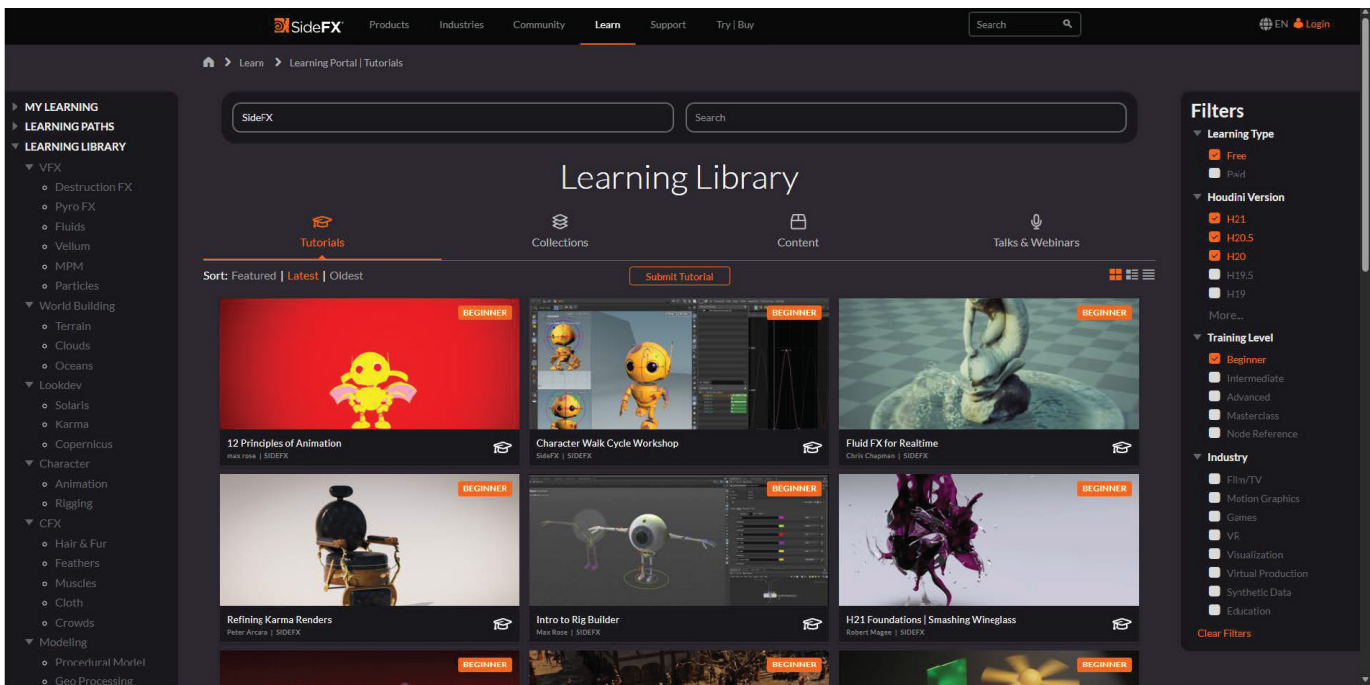
sidefx.com >



Hover over the Learn tab, click on Learning Portal | Tutorials.



Use Learning Library Categories on the left and Filters on the right

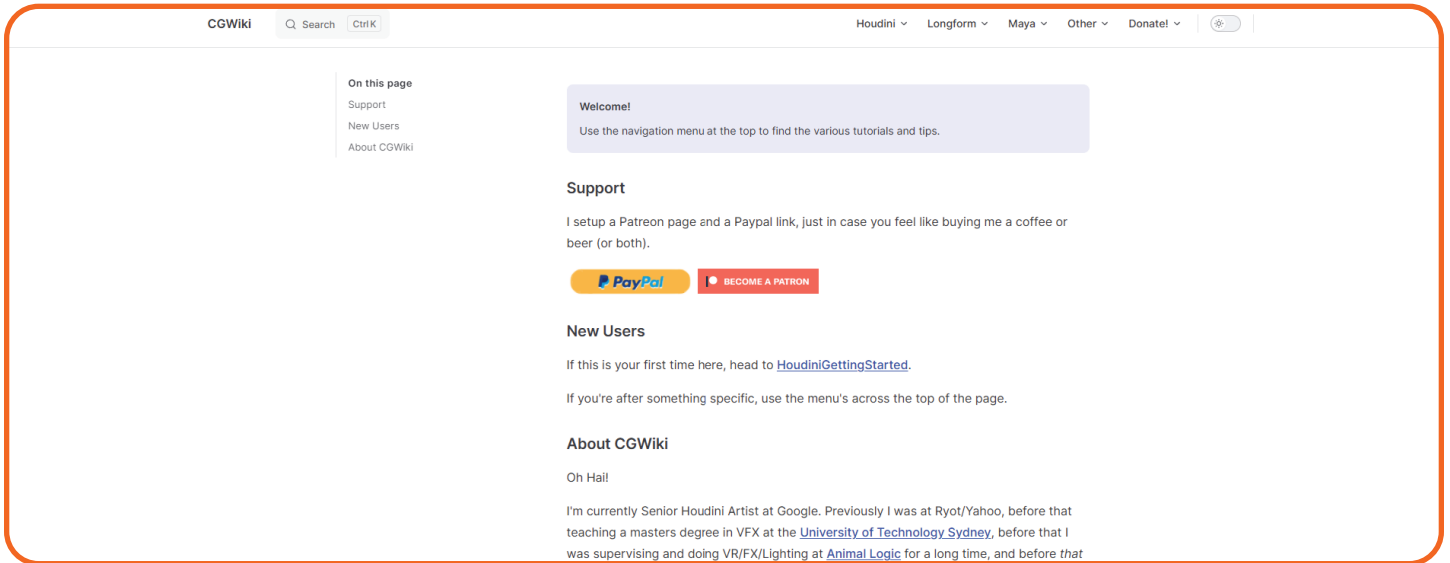


Filter content by Houdini Version, Training Level and Search. Once filtered, click on any video to start learning

cg wiki

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.

tokeru.com/cgwiki >



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

