

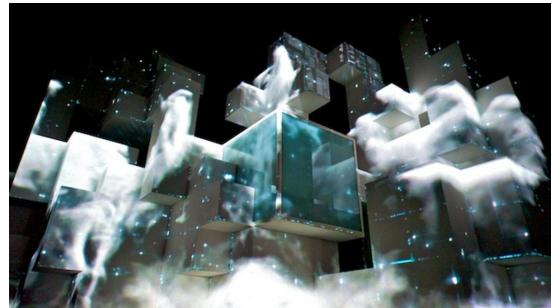
# Projection Mapping with TouchDesigner

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# Sources

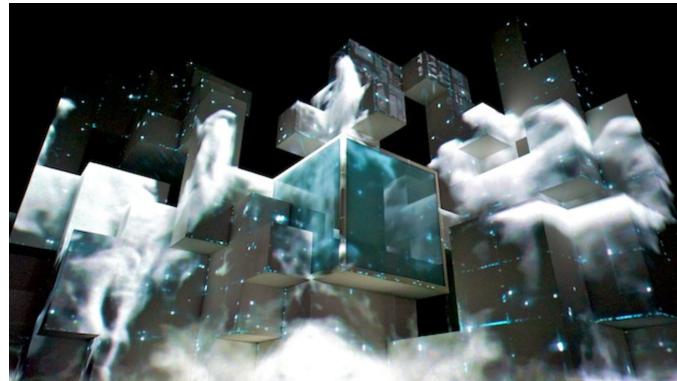
- <https://derivative.ca/feature/projection-mapping/14>
- <https://docs.derivative.ca/Palette:camSchnapr>
- <https://www.youtube.com/watch?v=1QyFy6aJM4U>

# Projection Mapping



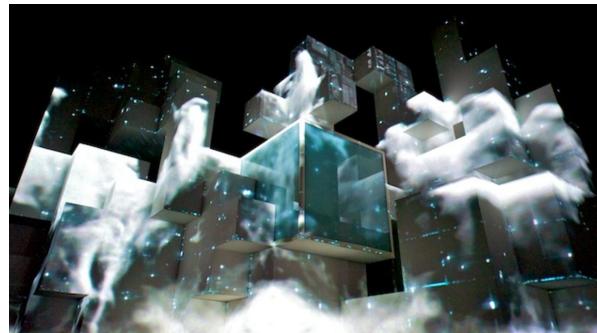
- Projection mapping involves building a custom solution to each new job – no two projection setups are the same
- TouchDesigner has a number of features and tools that make any projection project possible
- Offers multiple approaches to tackle projection projects, depending on scenario and budget

# Projection Mapping



- You can use the “Stoner” tool for shaping your output with keystones and grid-type mesh warping
- “ProjectorBlend” tool handles project blending and initial project setup

# 2D Projection Mapping



- “Kantan Mapper” tool for 2D projection mapping and masking – lets you create polygons and bezier layer shapes to apply any image, movie or texture to map and mask anything your project hits with light
- Shaping the output further with keystone and warping tools can also be applied per layer

# 3D Projection Mapping



- 3D projection mapping is more complex than 2D
- Use the "Camschnappr" tool for 3D mapping
- Given a 3D model of the object onto which you are projecting, line up 6 points with the Camschnappr interface and calculate the position of the project automatically adjusting the output to fit the 3D shape
- For large and complex mapping scenes, TD also has native support for 3rd party mapping solutions like Vioso and Scalable Displays software

# Summary of TD Features for Projection Mapping

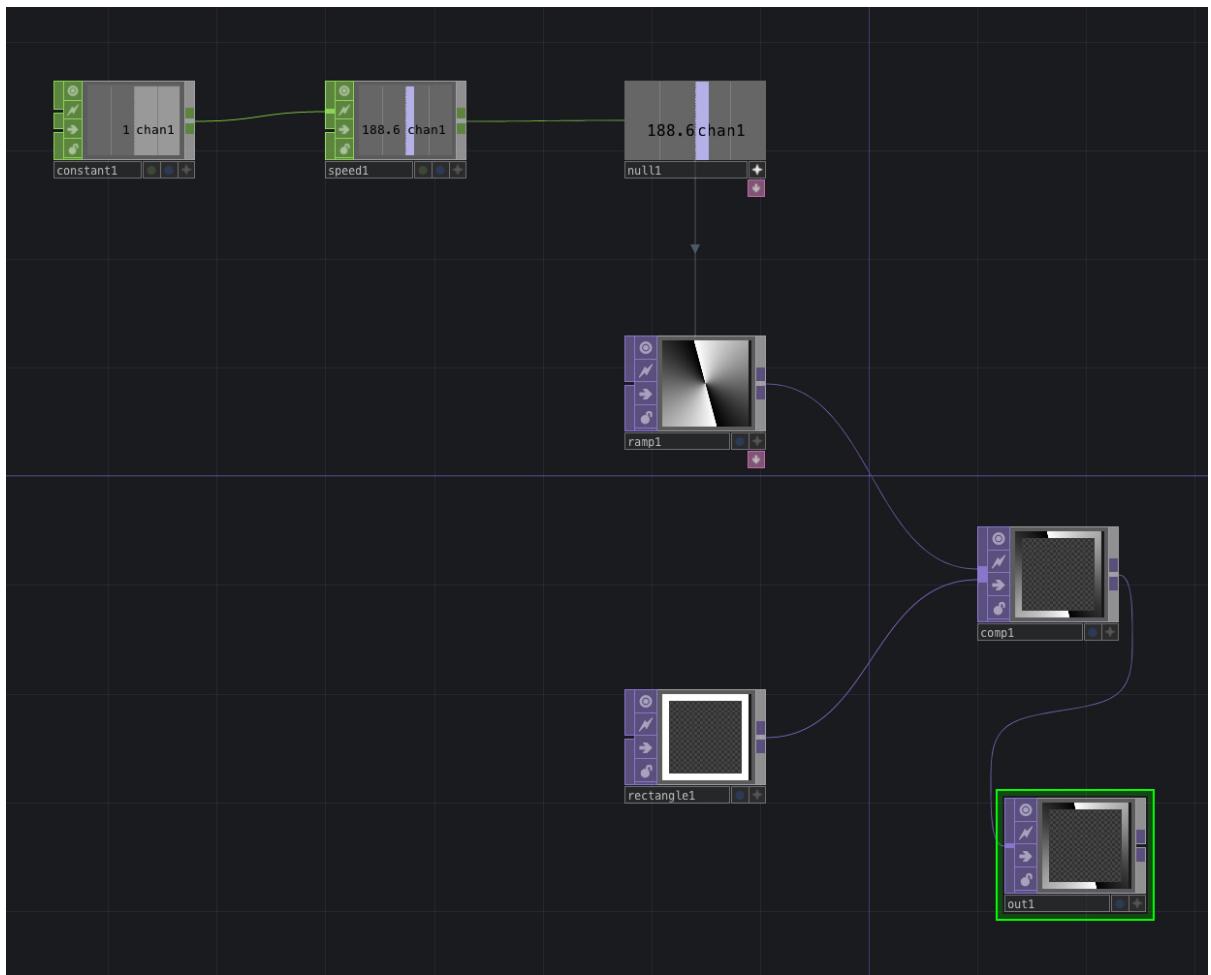
- Tight integration with the real-time 3D engine allows for complete **pre-visualization** of projection setups
- Support for a wide variety of projection **formats** for mapping, dome, VR, stitching, and environment lights.
- "Stoner" tool for **keystoning**, grid mesh warping, and masking.
- "Kantan Mapper" tool for advanced **2D mapping** and masking including freeform and bezier shapes.
- "Camschnappr" tool for **3D model based projection** alignment and calibration.
- "SweetSpot" tool for **trompe l'oeil effects** that create an optical illusion of 3D from a 2D output.
- **Support for 3rd party solutions** like Scalable Display's and Vioso's automatic mapping calibration tools.

# Set up your objects and your projector



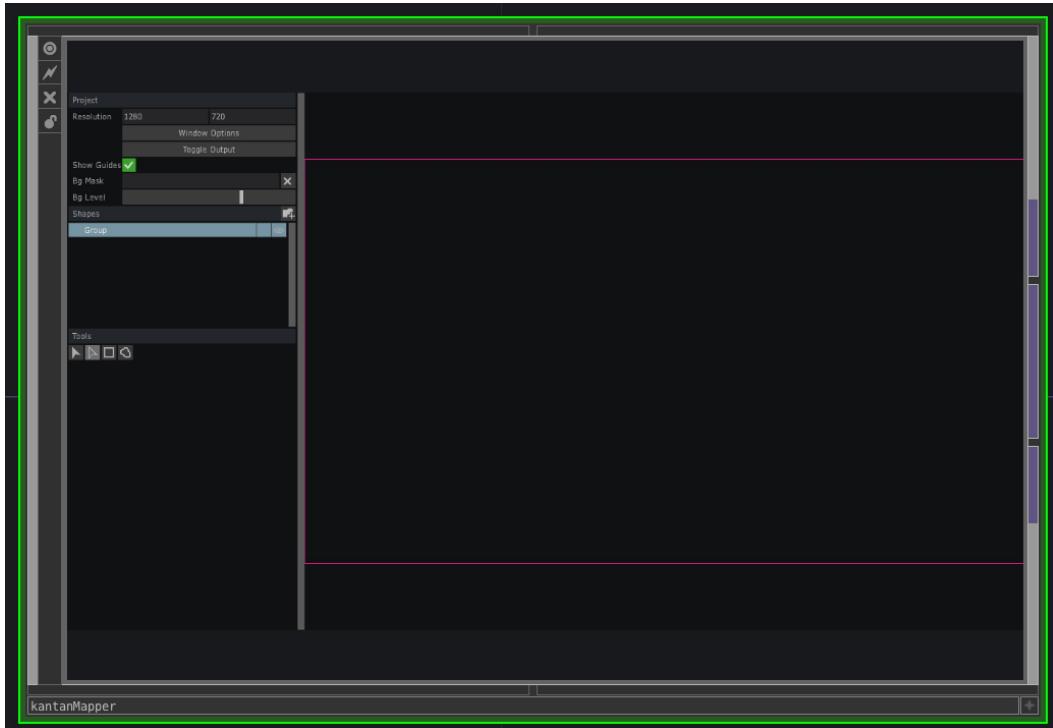
- Set up the object that you want to project onto
- Set up your projector so that it brightly illuminates the object from the perspective that you want people to view the object from

# Create some content



- Create a Container Component to hold some content and call it “content”

# Getting the Kantan Mapper



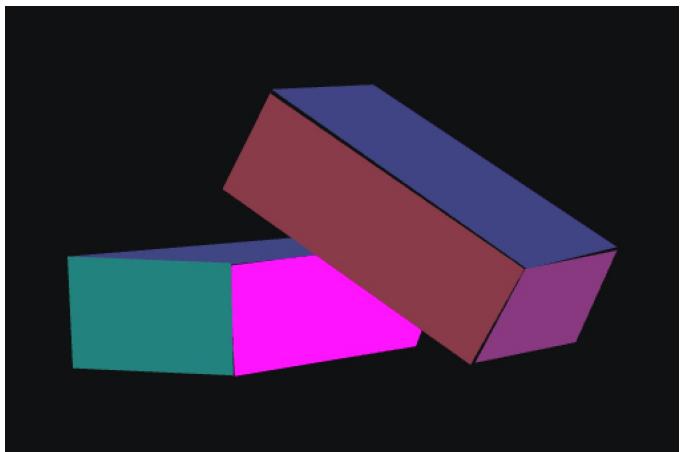
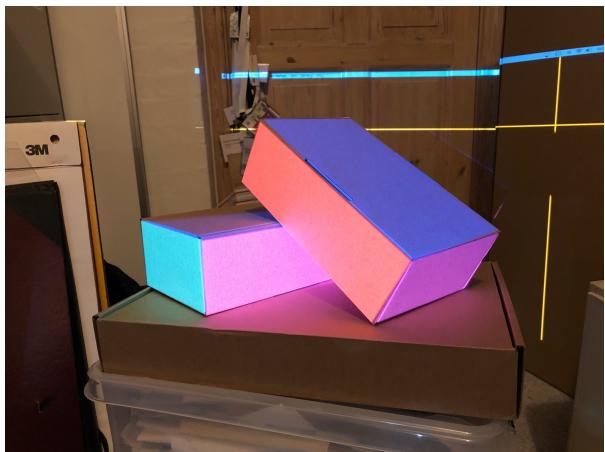
- Create a new component in the root component and call it “Kantan”
  - Kantan doesn’t work properly if you place it at the root level of your project
- Go inside and drag in a KantanMapper component from the Palette Browser
  - It’s probably under the “Mapping” folder

# Setting up Kantan with your projector



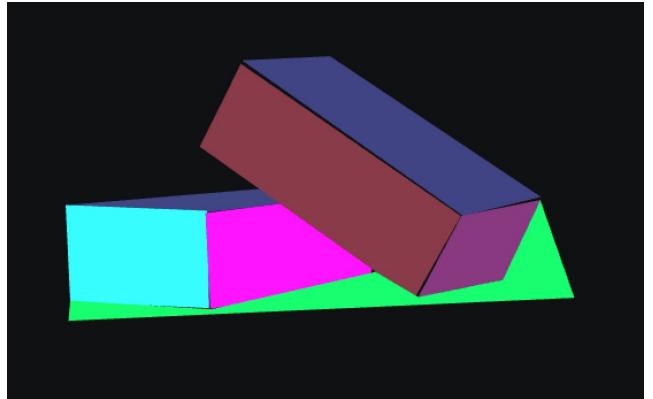
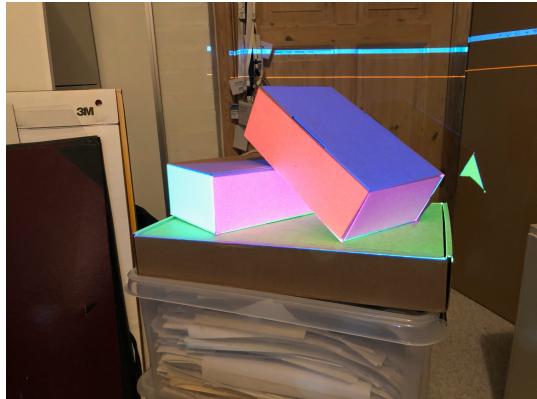
- Under “Kantan” properties page, there are two buttons that open and close the Kantan Window
  - Open the Kantan Window!
- Set “Always on Top” to “On”
  - Makes output always visible
- If you have a projector:
  - Set resolution to that of your projector
  - Click on “Window Options”
  - Set Monitor to 1 or 2 or ... depending on the index of your projector
- If you don’t have a projector:
  - Set resolution to 640 x 480
  - Click on “Window Options”
  - Set monitor to 0
- Close Window Options
- Click on “Toggle Output” – outputs Kantan window to projector or to the window on the screen

# Quads



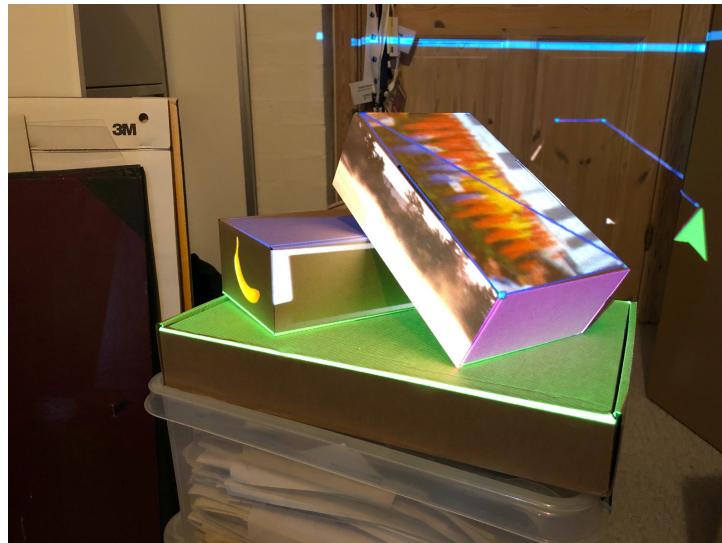
- Create some quads and map them to the surfaces of your object
- Note that when you move your cursor over the pink workspace in the Kantan Window, an orange cross-hair moves over your output
- You can work either in the Kantan work panel or in the projector output
- When creating a quad:
  - Click down to place the top left corner, drag to the bottom right corner and release
  - Move the bottom left and top right corners to their correct positions
- By default, when you create a new quad, it is added to the list of Shapes
  - Shapes further down the list are on top of shapes above them in the list
  - You can move the shapes around in the list to change the order
- Put shapes in a group so that you can manipulate them all together
  - e.g., if your object is moved and you have to move all the shapes slightly to the right or left

# Freeform shapes



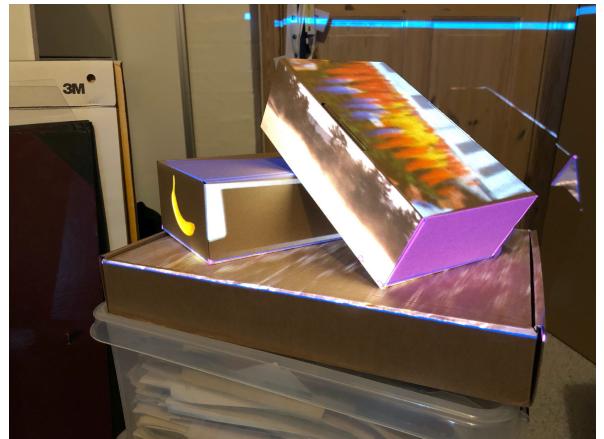
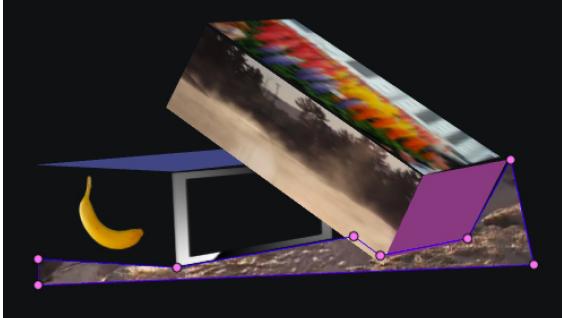
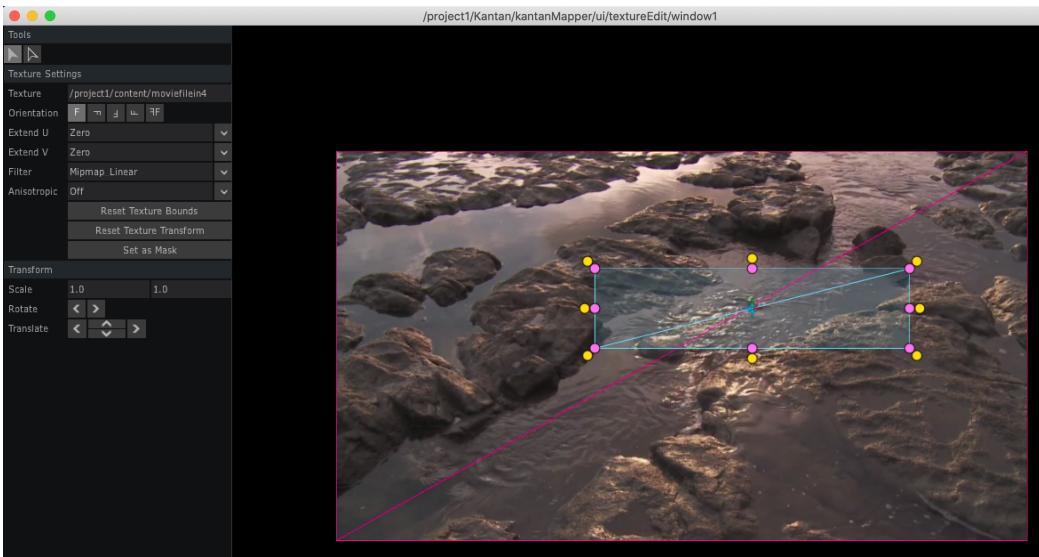
- Use the freeform tool to create surfaces with more than 4 corners

# Adding textures



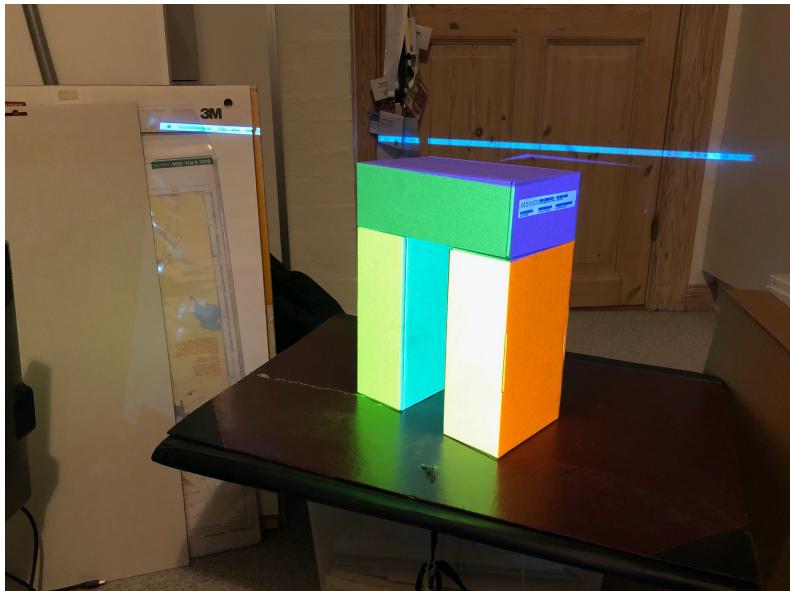
- Textures can be any TOP
- You can create your own textures or you can import images and movies
- Drag the source TOP to the “Texture” parameter for the desired shape
  - Remember to check the box to the right of the parameter box

# Editing textures



- Press the “Edit Texture” button in the Kantan Window to edit the portion of the texture used in the mask
- In the Edit Texture window, you can press the “Set as Mask” button to obtain a copy of the mask that you can move around in the texture
  - You can increase the amount of the texture included by increasing the Scale factor
- You can also repeat textures and transform them

# Intro to 3D Mapping



- Create a 3d model (e.g., using Cinema4D)
- UV unwrap it and export it as an FBX file
- Drag the FBX file into TD
- Drag a CamSchnappr COMP into your network
- In CamSchnappr
  - Set “Show Wireframe” to ON
  - Set “Texture Alpha” to 1
  - Set “Output Monitor” to your Projector
  - Set the “Geo SOP” to the mesh SOP in the imported model
  - Click on “Open Output” to open the output window
  - Choose at least 6 well-spaced vertices and move them to their correct positions in the projected window