

DESIGN RENDERING



Objective

The purpose of this short paper is to demonstrate the different rendering techniques that I use to communicate ideas throughout the design process.

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Introduction

Design is a creative process in which we bring ideas to reality.

Rendering is a catch-all term for what is essentially the job of creating an image to explain an idea.

I have found that the rendering techniques I use can be broken down into three stages:

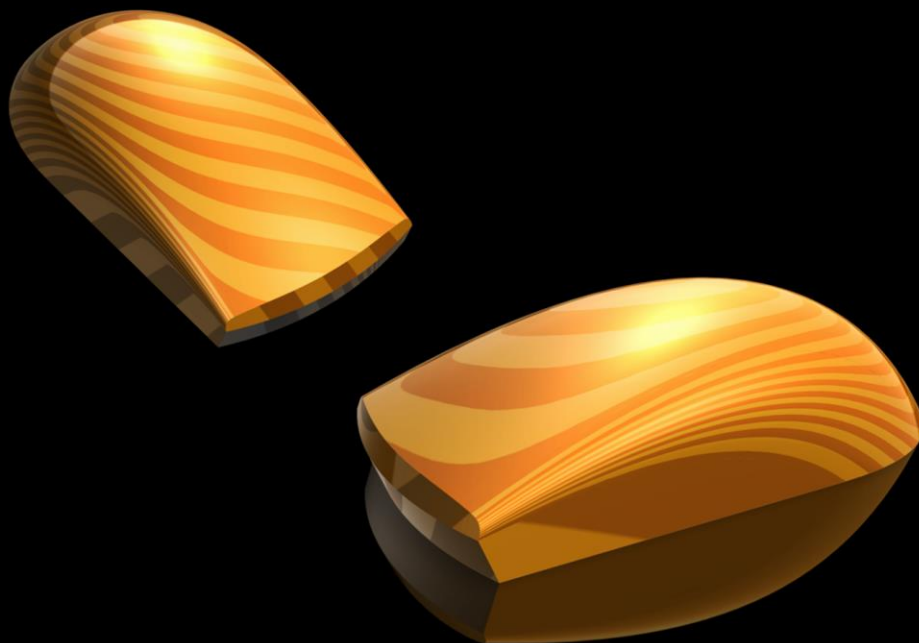
1. The Conceptual Stage
2. The Working Stage
3. The Final Design

At the *start* we want tools that allow us to explore lots of ideas quickly and efficiently.

At the *end* we typically need tools that can create highly realistic visualisations.

In the *middle* we need a mixture of the two approaches.

I hope this short paper gives you an insight into the tools I use over the three different stages. We begin with Stage 1...



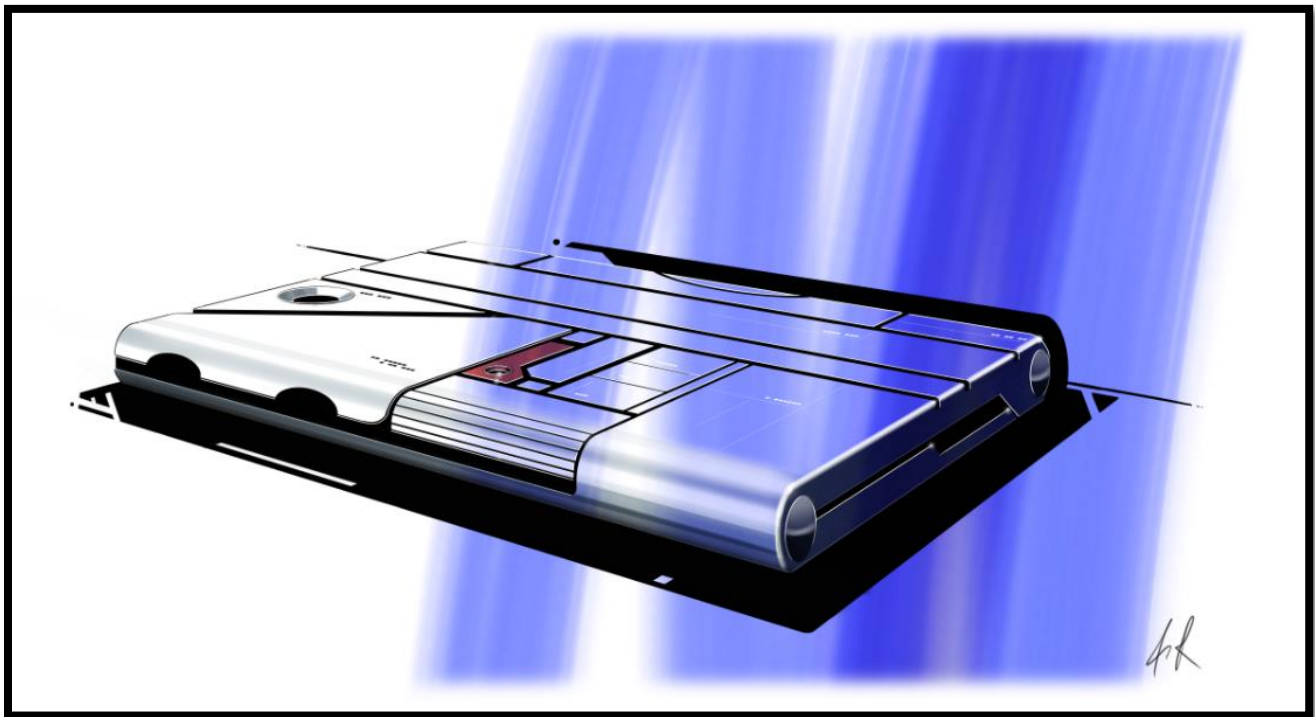
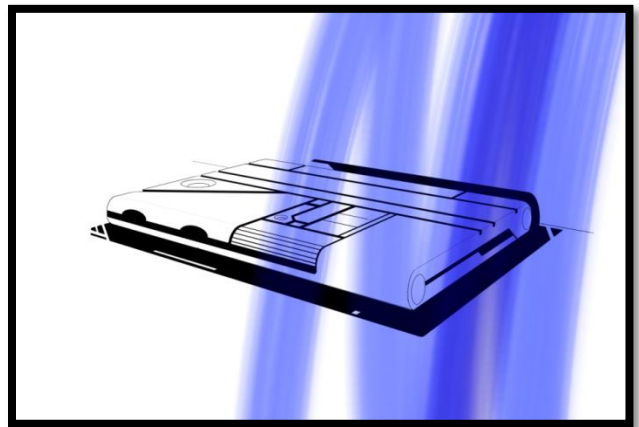
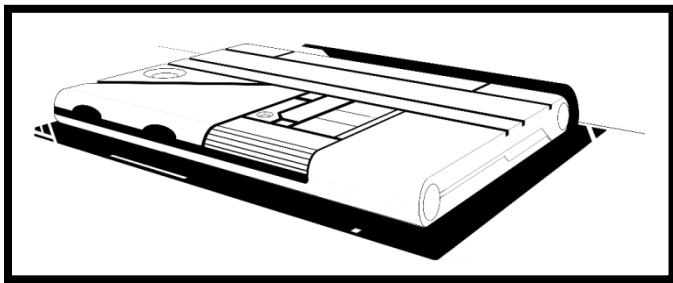
Part 1: The Conceptual Stage

CAD offers pinpoint accuracy but at the start of the design process when we are trying to develop or explore an idea it helps to work by hand.

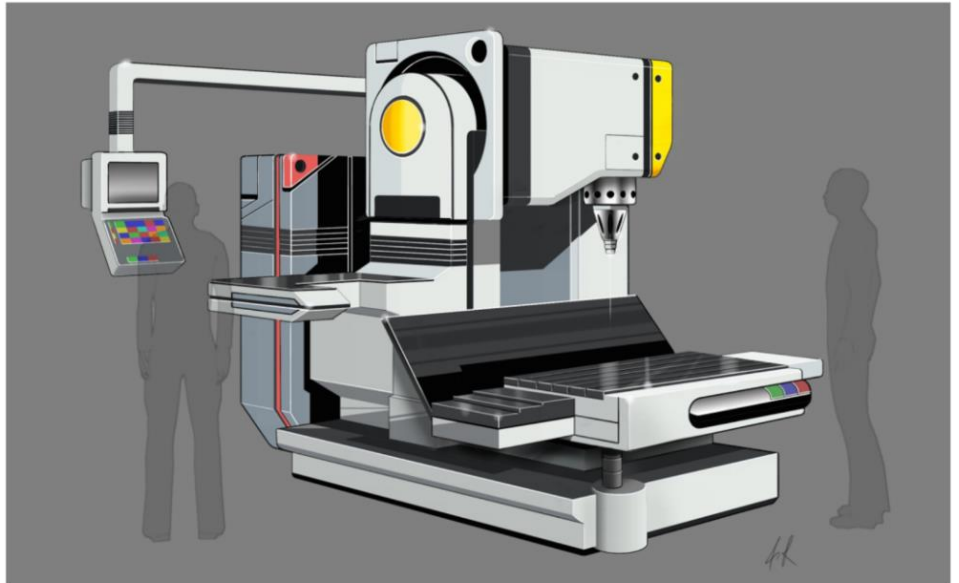
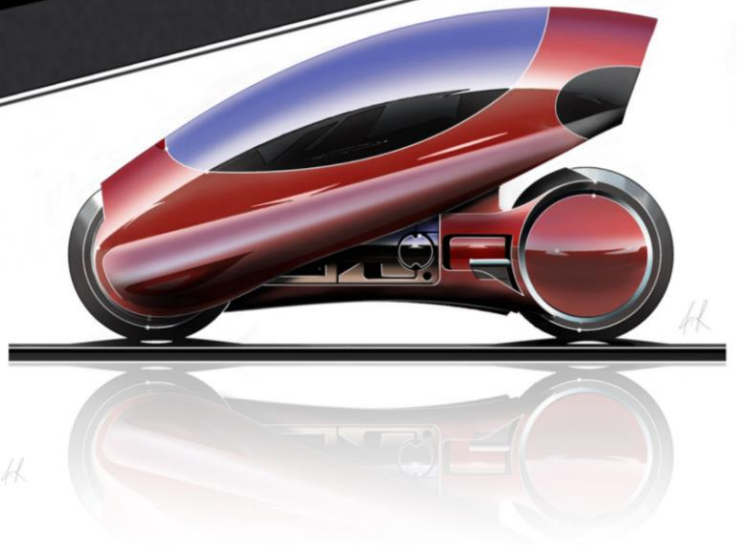
By sketching only what is absolutely essential I can create a looser image. This is a more forgiving way of presenting conceptual ideas as the viewer has the creative freedom to read other solutions from the illustration.

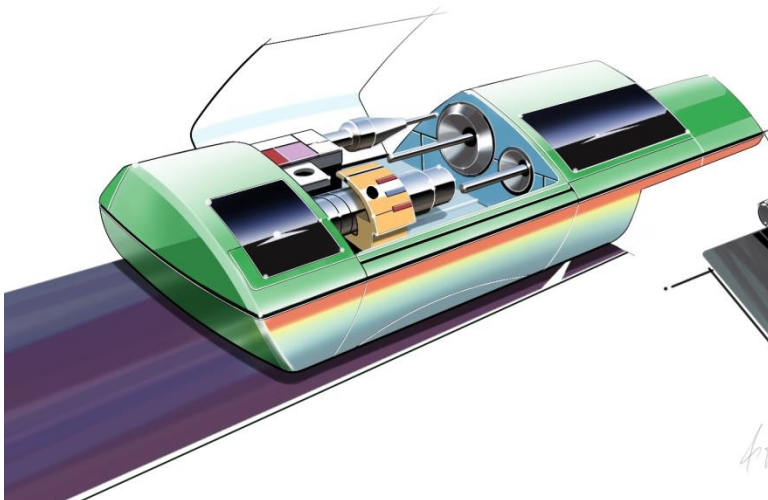
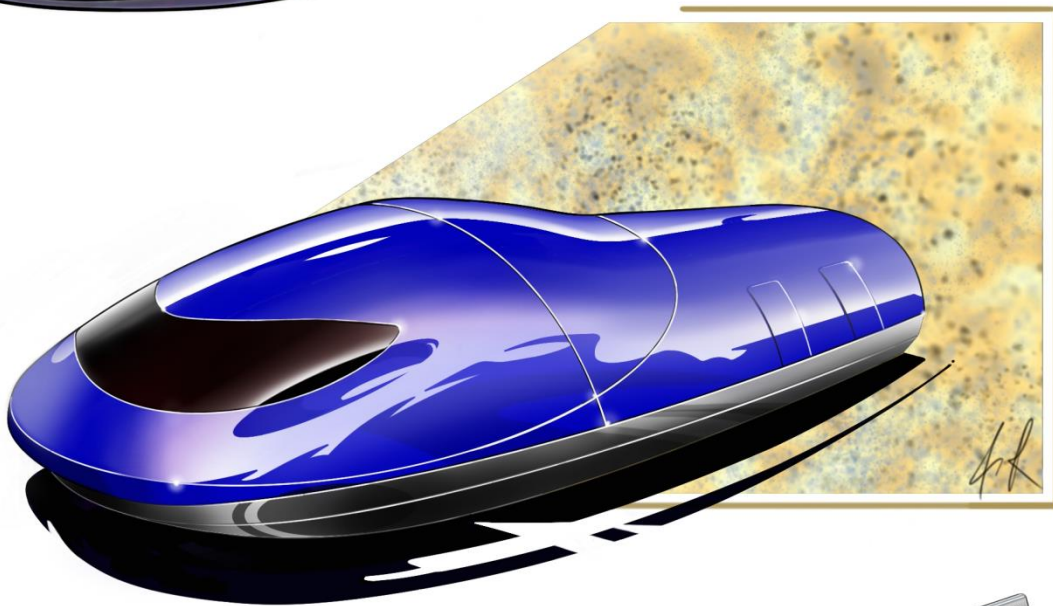
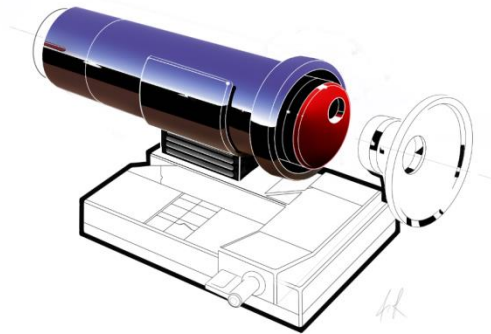
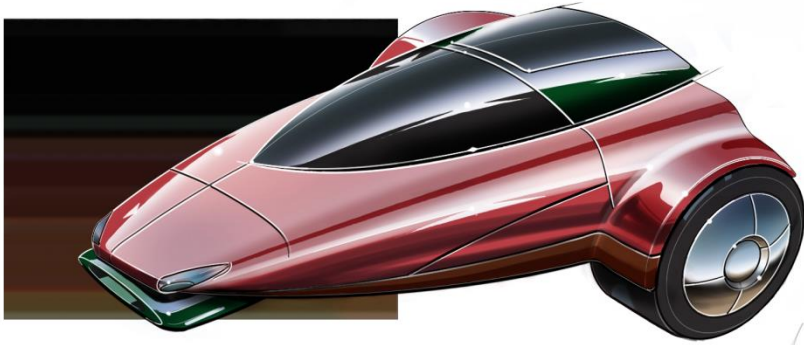
The best freehand approach I have found is with marker pens. Rendering with markers is a rapid visualisation technique that I originally learnt by purchasing an obscure collection of Japanese books on the topic.

To give you an idea of the type of work that can be created I have shown over the next three pages samples from my original training.



Note that all of the renderings in this section were completed digitally, using the Copic Marker collection found within Autodesk Sketchbook Pro along with an interactive Wacom Cintiq monitor.



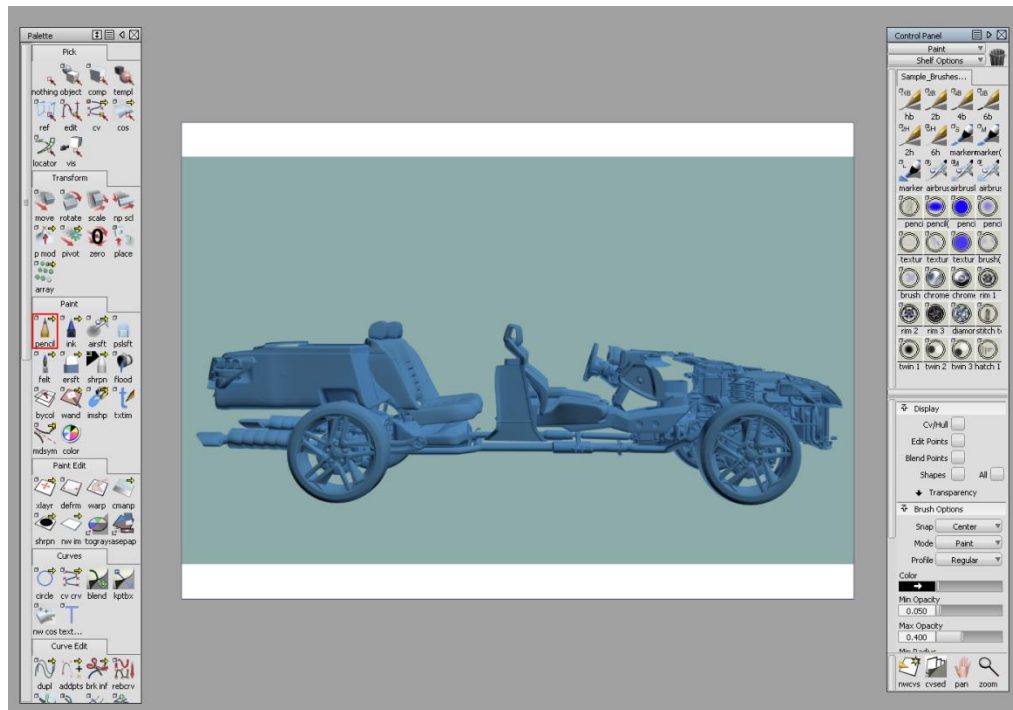


Part 2: The Working Stage

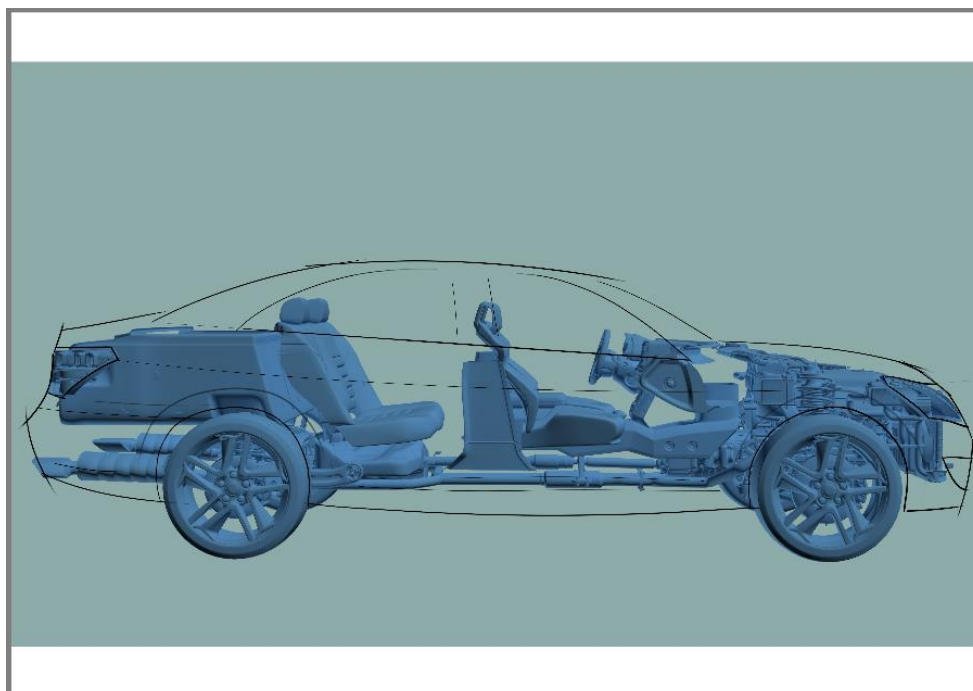
Once any conceptual work has been approved and we hit the working stage I would expect to see certain aspects of the design frozen. From this point on I will be working on specific aspects of the design.

A powerful technique for developing ideas quickly at this stage is being able to sketch directly over a CAD model.

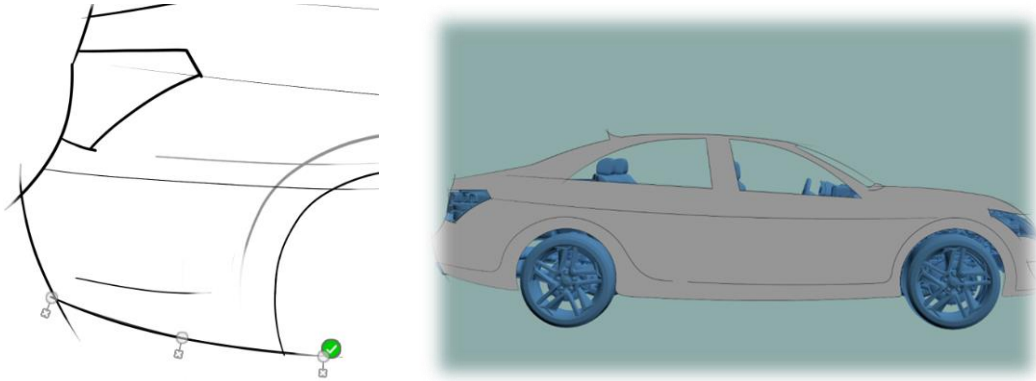
For this example I am working in Alias and I have started by establishing the perspective view that I would like to present. I then place a virtual sheet of A2 paper over the lens of the camera.



I can now sketch out my design freehand using the model as an underlay:

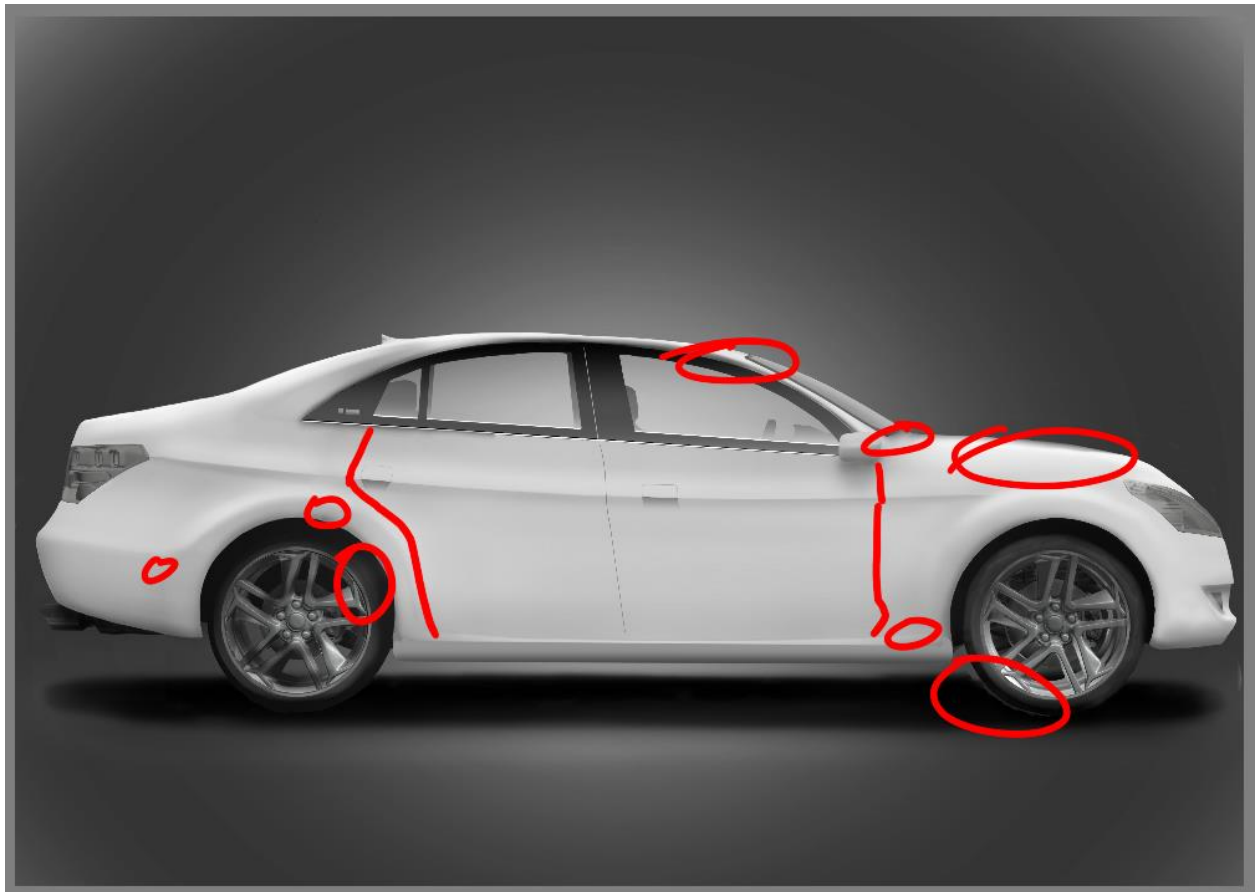


Once I am happy with the basic sketch I will convert the line work into curves and then block in the base colour of the main regions using a neutral grey.



I then use an airbrush to work the base grey colour up and down in value to define the form of the individual parts.

As I establish the design I will pick out areas of the drawing that I am not happy with and mark them out in red on a separate review layer.



Once I am satisfied with the basic form I will add in colour and reflections and the working drawing is complete.

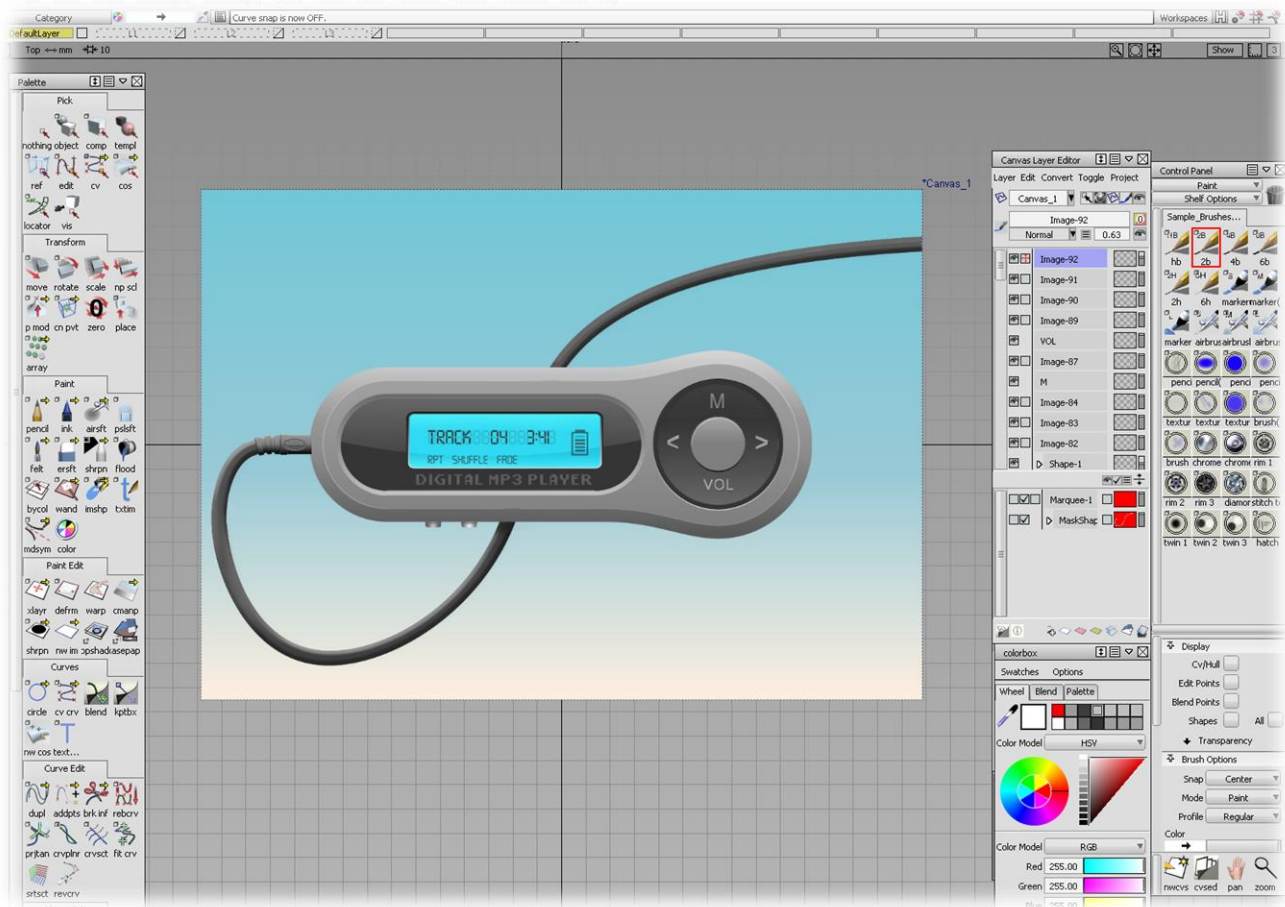


Note that because I used a CAD underlay at the start I can easily bring this back in for additional context if needed.



Another useful rendering technique at the working stage is to project 2D sketches directly onto 3D geometry.

In the example below I have created a sketch of a MP3 player.



I then projected the illustration directly onto the surface of a 3D model to create a rendering that fits somewhere between conceptual and highly accurate.



Part 3: The Final Design

At this point in the design I would expect to have some form of 3D model finished. The goal is to take photographs of the digital model in order to save the expense of building a physical prototype and commissioning a photographer.

My approach for presentation rendering is to use either Autodesk Showcase or Autodesk 3ds Max.

Showcase is my day-to-day tool for rapid visualisation as it is fast, reliable and highly effective.



Showcase in many ways is like Microsoft PowerPoint on steroids.

With Showcase I can create high quality still shots, movies and real-time presentations that are fantastic for stakeholder meetings, trade shows and marketing events.

Please be aware that I can supply you with an easy to use viewer that gives you the ability to deliver your own presentations.

A Showcase design presentation will allow you to run through different; views, materials, configurations and animations without an internet connection.

Each presentation will include a fully rendered CAD model that you can manipulate in front of your audience to help answer any questions they might have.

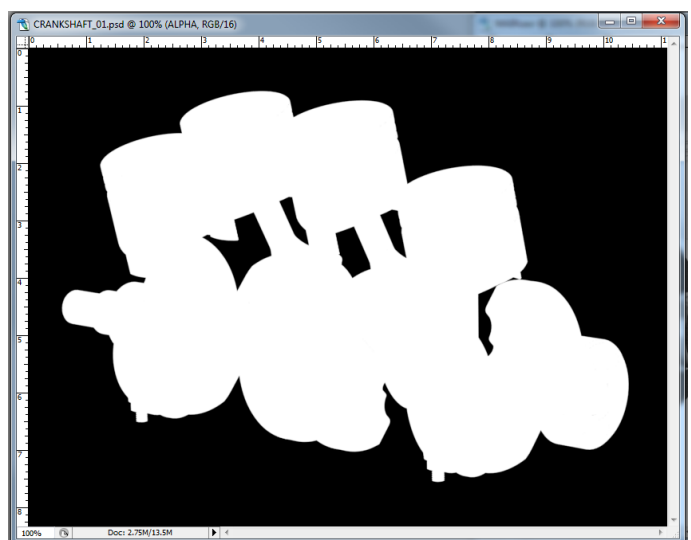
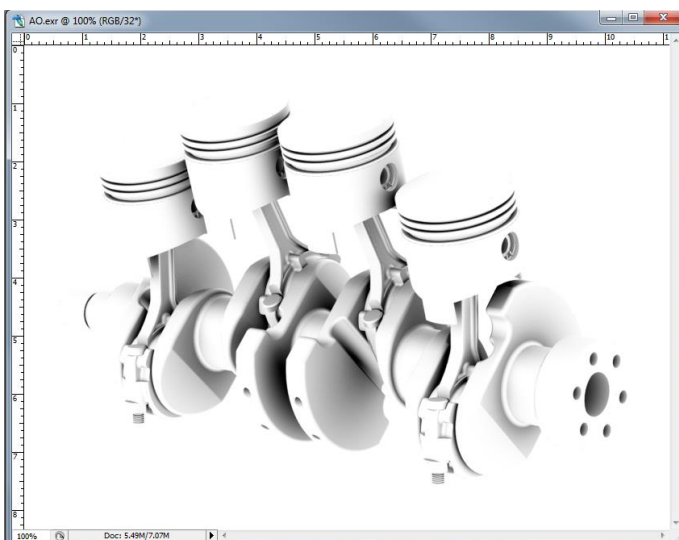


However as good as Showcase is there are times when we will run up against its limits. For renders that require greater levels of control I will use Autodesk 3ds Max.

3ds Max is a well-established tool for creating accurate and highly realistic still shots and/or animations.



3ds Max allows for multi-pass rendering and compositing. Compositing is the art of combining multiple images into a final picture. This technique gives me a much greater level of creative control.



I hope this short paper has shown you that during the mechanical design process different rendering techniques are required.

If you have a mechanical design problem that you would like to discuss then get in touch today:

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