3D Automotive Modeling
3D Automotive Modeling
An Insider’s Guide to 3D Car Modeling and Design for Games and Film

Andrew Gahan
To the members of the www.3d-for-games.com/forum and the rest of my friends.
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Everyone at Autodesk, www.autodesk.com

And a special thank you to everyone else who helped me along the way

Finally, thank you for picking up the book. I hope you enjoy it.
Foreword

What a decade of advancements in interactive game technology—to think that only 10 to 15 years ago we were pushing the envelope with car models for PC games that could today run glitch-free in many mobile phone games. We’re certainly experiencing an exciting era in game development! However, this never-relenting progression in games technology has a double-edged-sword effect.

Sure, we can now achieve spectacular-looking in-game graphics that almost rival 3D movie content, but at exorbitant costs in time, artist resources, and money. The vehicle models that took 1 week to produce 10 years ago now often take 6 or more weeks to produce. One only need look at the seemingly never-ending delays in the release of GT5 to understand how the eye-candy aspect of game design has spiraled to almost out-of-control levels.

We’re almost at the plateau where movie content crosses over into game applications. Although they are still vastly different mediums and still require totally different approaches, we are seeing more artists jumping ship and switching between the mediums without too much difficulty.

To me, one of the most rewarding challenges of creating vehicles for real-time applications has been in using the least amount of geometry to achieve the best possible effect . . . optimization and balance being the critical areas of the design with the desired outcome to produce clean, refined meshes that look pleasing in-game. The advent of bump maps and, more important normal maps has helped add fine detail to models instead of using geometry or relying on texture maps to simulate details. Material shaders, specular maps, ambient occlusion, and advances in lighting technology help provide more realistic-looking metals, rubber, plastics, and glass and in many instances have replaced the use of a diffuse texture map altogether.

Modeling aids such as CAD, 3D scanned data, and digitized data can remove much of the guesswork from modeling and help produce very accurate models, although at the expense of removing much of the creative or artistic challenge, and thus making the modeling process a more sterile experience.

As for vehicle artists themselves, what makes them so passionate about wanting to create digital vehicles?

From my own personal experience, it was my love of cars, motorsports, racing games, and art that prompted me to look into 3D modeling apps and teach myself how to model vehicles.
I see this same passion in many of the vehicle artists who have worked with me over the years: their love of all things automotive, often combined with a need to express themselves (artistically) initiated their delving into 3D. For many this passion eventually leads to pursuing a career as a 3D artist.

My 3D modeling quest began almost 20 years ago, and, as I’ve already mentioned, technology has progressed in leaps and bounds since then, as have learning aids, such as online tutorials, Internet forums, videos, and the modeling tools themselves. Finally we have a book that is dedicated to the subject. Whether you are a professional artist or a beginner, I hope you learn from this book and, more important, enjoy the experience.

Chris Wise
Managing Director,
Virtual Mechanix
Introduction

Important Information About this Book

First of all, I’d like to start off with a little bit of important information about this book.

First, this is not a book for complete beginners. If you are new to modeling for games and are looking for simple tutorials to get you up to speed, start off with *3ds Max Modeling for Games* (2008) by Andrew Gahan or the training videos *Max in Minutes* and *Maya in Minutes* from Focal Press.

This will give you all of the basics to get your modeling up to speed. You should also have registered at www.3d-for-games.com/forum. This is a dedicated forum designed to help you through the tutorials of all the books and tutorials I’ve written, as well as answer any questions you may have about 3D, Games, CGI, or anything else. Just log in and we will be on hand to help you with anything you may need. There are also regular competitions and threads to showcase your work and post your work in progress for help and advice, among a myriad of other topics.

Why This Book Was Written

This book is designed to bring the two important skills of design and modeling together and to feature some of the best designers and modelers in the industry. I have produced this book to showcase how ideas start from nothing, go through a design phase, move on to blueprints, and then finally finish rendered as 3D models. I want to show you exactly how the professionals work, in their words, revealing exactly how they work, how they solve problems, and how they earn a living designing and modeling vehicles for games, films, and the vehicle manufacturers themselves.

Having worked in the games industry for almost 20 years and worked on lots of titles with scores of professional designers and modelers, I knew exactly who to ask to help me with this project.

About the Guest Writers

Let me introduce you to the guest writers and let them tell you a little about themselves in their own words. These guys are at the top of their game and a pleasure to work with. They always amaze me with their talent, skill, and dedication, and it’s an honor for them to be part of this project.
Introduction

Brook Middlecott Banham

I was born in Abilene, Texas, and raised in the United Kingdom. My mother is Texan and my father is English. I adopted my father’s passion for cars and my mother’s artistic talents and started drawing cars at the early age of three. To the horror of my mother, my very first word was “Pontiac.”

I got my first degree at Coventry University in transport design in 2000 and since have worked with an international range of clients, including Volkswagen, Microsoft, Hewlett Packard, Puma, BMW, Frog Design, Astro Studios, Hot Wheels, Motorola, and Disney.

Since 2007 my wife and partner in crime, Judith Banham, and I have run our own design studio, Middlecott Design. I am also currently in the first year of a master’s degree program in transport design at the College for Creative Studies (CCS) in Detroit, Michigan.

Tim Brown

I’ve been obsessed with cars for about as long as I can remember and was always drawing cars as a kid, so I didn’t have to think too hard about which career path to follow! After studying transport design at the BA level, I obtained a master’s degree in vehicle design at the Royal College of Art in London.

I began my career at the celebrated product design agency Seymourpowell, also in London. Here I worked on a diverse portfolio of projects from helicopter interiors, to consumer electronics, to sex toys (yes, really!). Following on from Seymourpowell, I started working as a designer at Ford Motor Company in the south-east of England and am now based in Germany at Ford’s European design studio. I have been lucky also to work on many freelance projects over the past decade, as a designer, concept artist, and illustrator in the product, games, and media industries. Clients have included Sony Computer Entertainment Europe, Evolution Studios, and BBC’s Top Gear magazine. My favorite tool of the trade is Photoshop, in case you hadn’t guessed!

Johal Gow

I am the Lead Vehicle Artist at Simbin Development Team with responsibility for design document creation, creating specifications for upcoming games, managing outsourced artwork and artists, creating in-game and front-end artwork and renders, as well as inputting on all game graphics decisions.

I started out playing around with 3D artwork as a hobby at the age of 14. This seemed like a good way to pass the time compared to what I then considered boring schoolwork. Eventually this turned into a passion and I gained a scholarship for the Diploma of Screen at Qantm (specializing in animation) in Brisbane, Australia.

Shortly after finishing my schooling in 2004, I started in the industry with Virtual Mechanix, producing vehicles for the games Project Gotham Racing 3 and 4 (Bizarre Creations/Microsoft).

I then took the opportunity to work for Simbin Development Team on a contractual basis, which lasted two years before taking the plunge and moving from Australia to be in-house with the Swedish company in 2008. With Simbin, I have helped produce RACE (Simbin/Eidos), Caterham Expansion Pack (Simbin/Eidos),

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RACE 07 (Simbin), STCC – The Game (Simbin/Atari), GTR Evolution (Simbin/Atari), Race Pro (Simbin/Atari), Volvo – The Game (Simbin), and Race On (Simbin).

In 2010 I am still enjoying a happy relationship working at Simbin Development Team, but often take contractual work to improve my skills and keep up-to-date with all the latest technologies, the latest such game being Blur (Bizarre Creations/Activision).

Tom Painter

After working with 3D for more than 10 years, and with a firm foothold in the advertising, videogames, and VFX industries, I founded Big Man in 2008 in order to develop my own vision of the future of 3D.

Big Man specializes in the production of stylish 3D content. We have produced complex animations, environments, characters, and graphics for a very wide range of purposes. From cartoon, to realism or hyperreality, we are always looking to raise the bar.

Robert Forest

Born in Trinidad and raised in England, I studied design at Coventry University and the Royal College of Art and trained in Germany and Japan at Honda and Toyota. I since worked as contract designer on a number of transport projects before joining Princess Yachts, where I assumed responsibility for the styling and layout of their latest products, including their forthcoming superyacht.

During this time I continued designing vehicles for Sony PlayStation games and writing for Car Design News, this love for all things automotive taking me back to Tokyo where I have spent the past three years working in Honda’s advanced design studio.

Finding something new is the biggest challenge for a designer, as consumer values are always evolving. My sensitivity to the tastes of clients and customers plus my innate curiosity have led me to designing a wide array of well-received products, and I continue to relish any opportunity to create.

David Griffiths

I have been in the games industry now for over 12 years. I graduated from Blackpool & The Fylde College (part of Lancaster University) with a degree in technical illustration. I started my career in the automotive industry working freelance on site for a company called I.V.M. in Germany. I then moved naturally into games, first starting out with flight simulators.

Some of my notable roles in the games industry have been working as a Lead Artist for Pandemic Studios in Santa Monica, California, when I worked on Star Wars: The Clone Wars. On Clone Wars I was able to add to the Star Wars Universe where I designed the TX-130s Fighter Tank and the G.A.T. vehicles (among many others), which were used in other games, comics, and story books and have even been made into toys, models, and official Lego kits. The Fighter Tank has a very strong fan base, which is cool. Mercenaries was another great game to work on for Pandemic and Lucas Arts, which hit every major console.
I have also had the privilege to work on WRC title games like WRC: Rally Evolved on PS2 and on the well-received franchise PS3 games MotorStorm, MotorStorm: Pacific Rift, and the upcoming MotorStorm: Apocalypse.

**Paul Cartwright**

In the past I have worked in many areas of art and design, wall murals, sign making, fine art, and footwear design to name a few. In 2007, after spending six years in graphic design, I made the move to freelance and set up Zero 9 Studio to offer my illustrative design services.

I am now completely converted to digital art; the main software I use is Photoshop and Painter. I create artwork in whatever style is required for books, comics, and games. More recently I have been working as a contract concept artist in the video games industry, and this is the work I enjoy the most.


**About the Author**

I’ll keep this short and sweet, as I know your primary interest is how to model the vehicles in the gallery. 😊

I started in the games industry in 1992 as a Junior Artist for Digital Image Design. They came to my college and, after seeing my graphic design work, offered me a summer job making games. I jumped at the chance and, without any portfolio or experience at all, started training on my first game. I progressed to Senior Artist developing flight simulators and military training systems until the studio was bought by Infogrammes around 1998. I became Lead Artist when Infogrammes sold the studio to Rage. I then left and became Art Director at a small start-up called Lightning Interactive. I switched again to join my old friends from Digital Image Design at Evolution Studios (Evolution was set up when Infogrammes bought Digital Image Design with Martin Kenwright leaving, taking six people with him). I progressed through the ranks again at Evolution Studios, becoming Art Manager on some of the later World Rally Championship games on PlayStation 2 and then to Producer/Outsource Manager. I’m now a Senior Development Manager at Sony Computer Entertainment Europe and have been hard at work on the MotorStorm series on PlayStation 3 including MotorStorm, MotorStorm: Pacific Rift, and the newly announced MotorStorm: Apocalypse.

I’ve written *3ds Max Modeling for Games* (2008), Focal Press, and I edited *Game Art Complete* (2008), Focal Press. I also founded www.3d-for-games.com and www.3d-for-games.com/forum, which has now grown into an extremely friendly and vibrant 3D community where everyone helps out with any 3D-related issues and showcases their work. Specific help and support are given to anyone who registers and logs in. I’ve also just completed the *Max in Minutes* and *Maya in Minutes* video tutorials for Focal Press, so be sure to check them out to help you master the software in short, bite-size videos.

If you’re interested, here is the list of games I have helped to develop:

Robocop 3 (Amiga)

TFX (PC)
Inferno (PC)
EF2000 (PC)
F22—Air Dominance Fighter (PC)
Total Air War (PC)
Wargasm (PC)
GTC Africa (PS2)
World Rally Championship (PS2)
WRC II Extreme (PS2)
WRC 3 (PS2)
WRC 4 (PS2)
WRC 5—Rally Evolved (PS2)
MotorStorm (PS3)
Pursuit Force 2 (PS2)
MotorStorm: Pacific Rift (PS3)
Pacific Rift DLC (PS3)
MotorStorm Apocalypse (PS3)
OK, enough about me, let’s get on to the good stuff...