

What's Up MÄK

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Behind the Scenes with VR-Vantage *a word about the VR-Vantage roadmap by Jim Kogler*



MÄK is making a huge investment in our premier visual suite, VR-Vantage. Last year we made tremendous strides by adding ocean and maritime visualization. The work continues full force as we continue to improve our visual environment. The next release of VR-Vantage, 2.0, is planned for later this year and has two major directions: **performance improvements** and **visual quality enhancements**.

We are committed to improving performance in VR-Vantage. Look forward to shader optimizations that take advantage of game-based rendering techniques, an improved physics engine to enhance the visual interaction between objects (like ships that rock on the dynamic ocean), optimized loading algorithms for large terrains, and improved internal organization and grouping of geometries to maximize capabilities of the GPU. If that all sounds like techno-jargon, it is! We're focusing on the complicated stuff so you can focus on better-looking, better-performing scenes that run at 60 frames per second (fps), the gold standard of smooth visualization.

Visually, we are concentrating on several areas: a beautiful environment, lighting effects (both day and night), improved trees and vegetation, and high fidelity sensor/camera modeling.

Both the ocean and the sky in VR-Vantage have been greatly improved. The ocean supports many new features, including helicopter rotor wash, significantly faster/better wakes (both up close and from the air), and underwater crepuscular rays ("God Rays"). The sky draws faster and can be rendered with high-resolution clouds. Complex surf patterns on shorelines can now be configured through shape files, allowing surf to roll onto beaches and inlets accurately.

We have made tremendous improvements in both manmade and natural lighting. VR-Vantage 2.0 will support Forward+ lighting, allowing scenes to be generated with hundreds of light source objects that cast light on the scene. Flood taxiways with lights and add lights to every car, ambulance, and fire truck, all with minimal performance penalty. Stream or page these lights into any scene using simple and publicly available GIS data. Natural lighting has also been greatly improved. VR-Vantage 2.0 will support full High Dynamic Range (HDR) imaging to regulate light levels, as well as cascading shadows. HDR makes scenes look realistic in bright outdoor environments or dark indoor environments. And with cascading shadows, you will add an important level of realism to your scene.

We've started the process of upgrading our SpeedTree to the latest IVE release, which adds endless realistic and high performance trees and vegetation to your scene; specify fields and forests using streaming vector data to quickly populate your world.

VR-Vantage 2.0 will be available at the end of 2014 but until then, we've released several Early Adopter (EA) releases to interested customers. If you are intrigued by any of the features and capabilities, let us know and we can get you an EA release to play with. We're doing a lot of exciting work in VR-Vantage and we want you to be a part of it! 🌸

Want more details about the VR-Vantage Roadmap?
Get in touch at info@mak.com.



DI-Guy 13 has arrived!

Your one-stop shop for realistic character models and scenario content

Whether you're simulating passengers on a plane, emergency responders tending to a car accident, soldiers fighting for a foreign military, or a businessman walking down a busy Brooklyn street, DI-Guy gives you the characters to create scenarios in whatever setting you need.

If you're like us, you might need to see it to believe it. So go on, take a peek at some of the new character content available (below) with the just-released DI-Guy 13! As you can tell, we've been busy updating our characters with detailed bump maps and highlights, but we haven't forgotten about the non-human models needed to set up realistic scenarios. Check out a few of the vehicles and city street props that make your scenario pop with realism.



What new capabilities can you expect from DI-Guy 13?

Streamlined Appearance Configuration System - This system reduces the burden to make hundreds of different appearances. In DI-Guy 13, enjoy using the same character body with a variety of carried objects (guns, phone, video camera, etc) and different heads to customize that character's appearance. Instead of modifying hundreds of soldiers with a new weapon, for example, just add the new weapon to a list of character-appropriate objects.

Instancing System - Need an army? Or a fully populated city? DI-Guy 13 adds a new shader-based instancing system enabling you to render distant characters 2.5x faster than before. Now you can have scenes with more than 3000 characters at interactive rates (more than 15-20 frames per second).

Animation System Upgrades - This release has given DI-Guy's animation system a lot of love. Here are some of the animation upgrades:



- **Real-time Inverse Kinematics (IK)** - Foot Step IK dynamically modifies a character's animation to adapt to changes in the terrain. Look at the graphic to the left of a soldier stepping on a curb - the blue lines represent where the soldier's foot would be without IK. IK also allows hands to be dynamically repositioned, meaning that they can adapt to different weapons or objects without you having to create new animations.
- **New Animation Importer and Conversion Pipeline** - Do You Know Maya? Our animation files can now be exported from Maya to Collada where industry standard tools can be used to modify them. The DI-Guy Motion Editor can now import Collada files, opening up many more options for animation creation.
- **Node Graph-based Animation Blend Tree System** - New to DI-Guy 13, this system enables DI-Guy to generate new motions from existing animations in real time. The ability to seamlessly blend similar animations allows DI-Guy to generate new omni-direction locomotion actions. For example, if you need a character to move at 2.5 m/s, you can specify the velocity and DI-Guy will generate a motion appropriate to that speed that shares the characteristics of both walking and running. Previously, users either needed to play a sped up walk or a slowed down run. 🌸



Want to see more of what you'll get with DI-Guy 13? Get in touch at info@mak.com!

Tips & Techniques

Deep in the Heart of Texas: Configuring Stars in VR-Vantage



While MÄK is based in Massachusetts, we have some very good friends down in Texas. If you are in Texas, or if you're just simulating it, you know that the stars at night need to shine really bright. VR-Vantage can help with that. VR-Vantage uses a real star map to calculate thousands of star positions for every day of every year. The stars are accurate, and if you look closely enough, you can pick out some of the planets as well.

When you simulate nighttime, it's necessary to make some of the stars brighter, or perhaps play with the luminosity of the moon. Here's how you can do that: While some of the details of sky configuration can be found in the GUI, some of the more obscure and advanced settings can be found in the file `vrantage/data/Environment/Sky/SilverLining.config`. If you look through this file, you will see many ways to configure the Sun, Moon, Clouds, Stars, and the Atmosphere.

To brighten the stars, look for a parameter named "star-magnitude-adjustment." Making this parameter smaller (negative) will increase their brightness. So, a value of -2 is brighter than a value of -1. If you want to see more stars, you need to increase the threshold which is used to cut dim stars from the sky: set a larger value in "minimum-star-magnitude."

Because "everything is bigger in Texas," you can increase the size of the stars by modifying the "star-point-size" parameter. Similarly for the moon, you can increase the "moon-width-degrees." Interestingly, the actual size of the moon is somewhere around 0.5 degrees. However, most people are conditioned to believe the moon is larger and prefer as high as 2-3 degrees.

Once you have made the moon larger, you may want to make it brighter. Set "moon-brightness-scale" and "moon-glow-intensity" to make the moon brighter. Be careful, it is possible to make the moon so bright the terrain will look like it's lit by the sun. To learn more about this tip, or to get your VR-Vantage questions answered, let us know at info@mak.com! 🌸

MÄKer Spotlight: DI-Babies!

Instead of spotlighting just one of our many talented MÄKers in this issue, we want to brag about all our new MÄKers on the DI-Guy team. And by new, we mean *really* new. Total babes, right?



Dov Pasternak



Anya Clarke-Midura



Leo Dreyfuss-Kaufman

Dad: Gedalia Pasternak, DI-Guy Team Lead

Mom: Rachela Pasternak

Birthday: February 2014

Most Proud Of: "I was born with a head full of luscious, dark locks. It can only go up from here."

Life goal: "To be even more like my daddy - we already pout the same so I'm halfway there!"

Dad: Marc Midura

Mom: Jody Clarke-Midura

Birthday: April 2014

Special Skills: "My parents say I'm good at spitting up and making funny faces when filling my diapers."

Life goal: "I would like to learn why my siblings MacBeth and Miranda look so different. Mom says they're cats, but I don't know what that means."

Dad: Gregory Dreyfuss-Kaufman, DI-Guy

Lead Project & Software Support Engineer

Mom: Peri Dreyfuss-Kaufman

Birthday: April 2014

Favorite Pasttime: "Aside from swimming in the tub, my favorite thing to do is have my parents read me my preferred work of fiction, *Brown Bear* by Eric Carle."

Life goal: "Sitting up would be cool, but also to one day create DI-Babes 1.0.0 with Anya and Dov."



We can't forget about the newest DI-Baby: DI-Guy 13, who joined the team on July 2014. Complete with new character models and props, this youngin' has a bright future making simulation scenarios pop with realism. (Read the [full DI-Guy 13 spotlight](#) on page 2!) 🌸