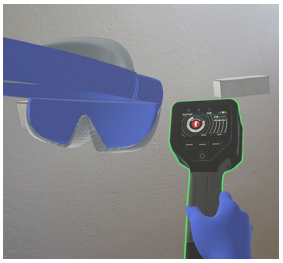
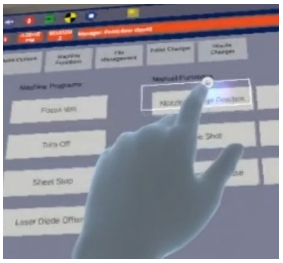
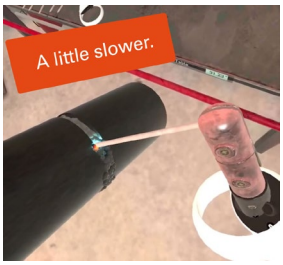
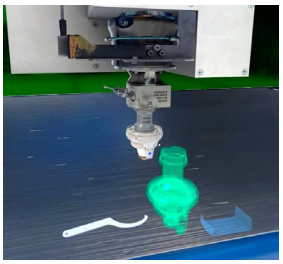
FORGEFX CAPABILITIES

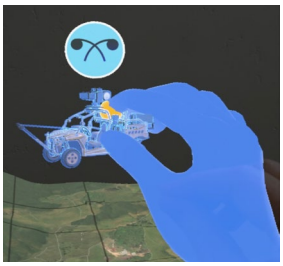
Detailing the strengths, history, process, tools, and technologies ForgeFX uses in developing training simulation solutions, and what sets us apart from competitors.





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INTRODUCTION

With over 20 years of experience and a track record of innovative, out-of-the-box thinking, ForgeFX is the ideal choice for the development of simulation-based training. The tight-knit, flexible team at ForgeFX offers a personal, dedicated, custom technology development service that caters to the specific requirements of our clients.

This document outlines our strengths and capabilities, demonstrating the benefits of engaging with us as your development partner. We include a description of our company and its history, an explanation of our software development methodology and work process, as well as detailed breakdowns of the technology solutions we employ.

This information is offered so that our prospective partners and clients understand what ForgeFX provides, how we are structured, and our philosophy—why we do things the way we do, and how our clients benefit from our knowledge, expertise, and flexible, iterative development process.

RECENT PROJECTS

Since 2002, ForgeFX Simulations has focused on the development of highly interactive 3D simulations for clients across a wide spectrum of industries. The simulation-based training that ForgeFX develops for our clients has set them apart as innovators in their industries. This section includes a collection of some of ForgeFX's latest development efforts for our clients.

CASE STUDY: STRATATECH EDUCATION GROUP

OcuWeld Welding Trainer for Meta Quest

ForgeFX recently worked with Tulsa Welding School and The Refrigeration School, Inc, to develop *OcuWeld*™, a virtual reality welding education simulator that teaches students how to prep, grind and join materials in a virtual environment that removes the safety and cost concerns.

Students are assigned a Meta Quest set on which *OcuWeld* is installed. Via *OcuWeld*, they log in to their Canvas learning management system accounts. ForgeFX worked closely with StrataTech to accurately reproduce the effects of welding with various types of torches and materials, mimicking as closely as possible the hands-on feel and physical effects of real-world tools.

Read more

CASE STUDY: SOMERO S-22EZ LASER SCREED

Concrete Screeding Trainer for Meta Quest

ForgeFX is excited to announce our recent development of the Meta Quest-based S-22EZ Laser Screed Simulator for Somero Enterprises, Inc. The simulator provides a detailed and accurate digital replica of the S-22EZ Laser Screed cockpit with simulated physical controls, buttons, and mechanical and visual feedback solutions. The Meta Quest's superior hand-tracking capabilities allows for a fully immersive experience without the need for physical hardware controls. The simulator incorporates a robust system for tracking trainee performance and presents them with a score card at the end of their session. This feature provides valuable insights into the progress of each trainee, enabling trainers to identify areas of strength and improvement.

Read more

CASE STUDY: TRUMPF TRULASER 2030

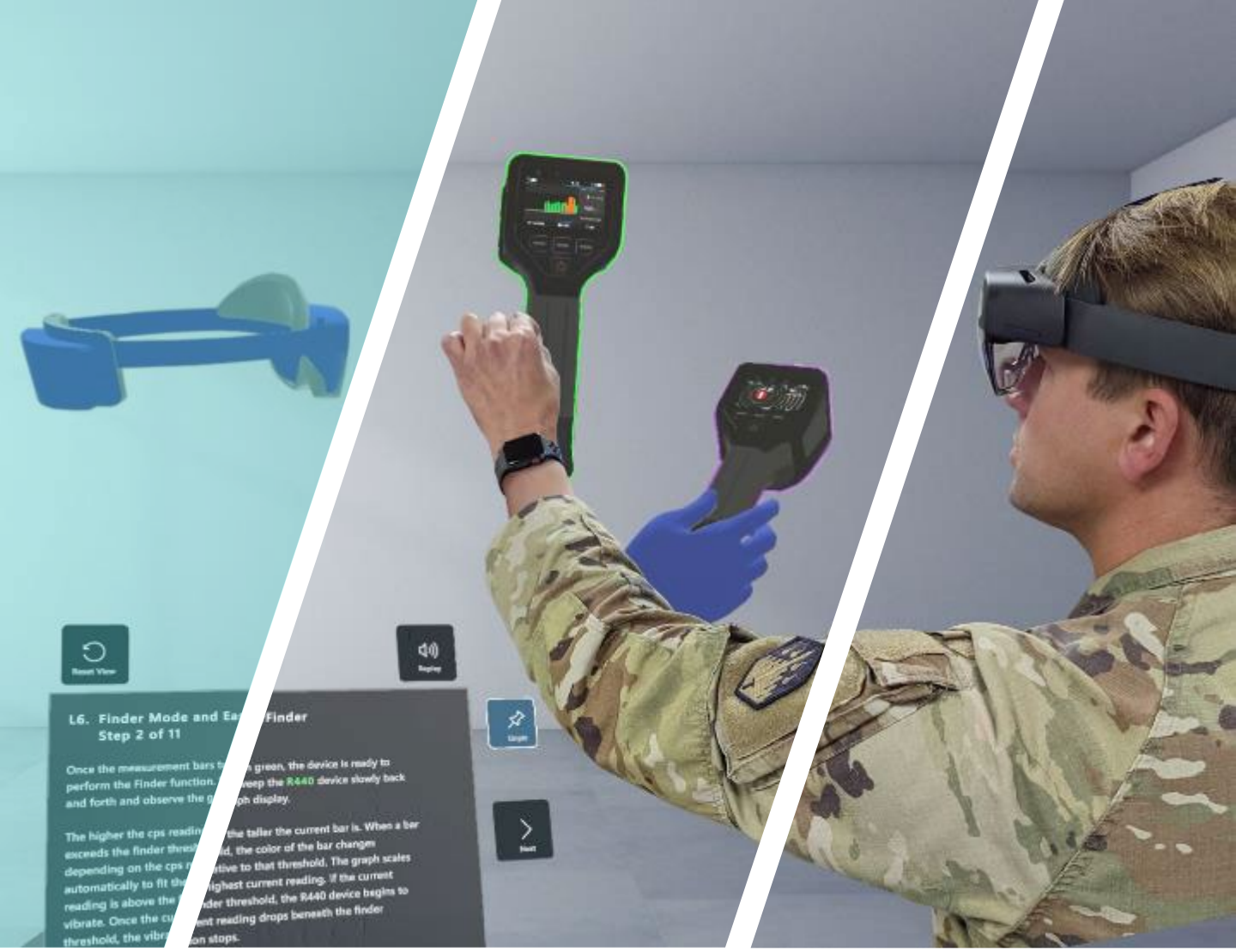
TRUMPF

Meta Quest-Powered Training

ForgeFX recently joined with Trumpf to develop *TruLaser 2030*, a VR simulator that educates students in how to replace the protective glass of the TruLaser 2030 fiber machine.

ForgeFX chose the Meta Quest headset because it meets important criteria such as a comfortable design for long use, a wide field of view, adjustable PPD, good battery life, modest cost, comfortable fit, and ease of use. Specific features that the application includes are the ability for a group to observe what's going on in the headset, by wirelessly casting a live feed to any external display; and the ability to record, save, and share training session .mp4 videos.

Read more



CASE STUDY: JPEO-CBRND

CBRND HoloTrainer

ForgeFX collaborated with MRIGlobal to develop the *CBRND HoloTrainer*, an augmented reality device training simulator built for the Microsoft HoloLens 2. The *CBRND HoloTrainer* instructs trainees in the familiarization, operation, and maintenance of chemical, biological, radiological, and nuclear detection devices by providing holographically-projected interactive 3D virtual versions of the equipment they need to learn to use. Trainees follow interactive narrated tutorial steps that teach the components and use of the devices and can learn collaboratively in a shared multi-user environment.

Read more

CASE STUDY: FORGEFX SHOWCASE

Leveraging Meta Quest Development Tools

ForgeFX made ample use of the Meta Quest Developer Hub and other support offered by Meta to create this VR showcase application. Because the demonstration is most effective as a multi-user experience, ForgeFX used the Meta Avatars SDK to allow users to easily project their presence into the simulation.

This application melds technology and education to deliver an immersive experience that transcends conventional sales methods. Inside the application, users take command of an excavator and perform pre-inspection steps and place pipes into a dumpster. This multi-user VR environment provides a real-time virtual meeting space where ForgeFX not only shows off our expertise but also demonstrates the benefits of multi-user training for both education and sales opportunities.

Read more

CASE STUDY: MIXED REALITY TRAINER

Demonstrating AR Expertise

This application is a demonstration of a typical familiarization tutorial in an Augmented Reality training simulation. Wearing a Meta Quest, users can follow tutorial steps that teach the components and use of a material sampling and analysis device. Similar to the ForgeFX Showcase, the *Mixed Reality Trainer* is a multi-user virtual environment in which participants can speak to and interact with each other and with the virtual objects. This is another example in which ForgeFX both demonstrates our proficiency with various Mixed Reality platforms and exemplifies the advantages of collaborative training.

Read more

CASE STUDY: JLG INDUSTRIES

A Long-Standing Partnership

Since 2014, ForgeFX has developed several simulator solutions for JLG Industries, the world's leading manufacturer of aerial work platforms, telehandlers, and other access equipment. Not only has ForgeFX developed simulators that provide training on various types of equipment; we also designed a Scenario Builder for JLG in which trainers can create and edit their own custom training scenarios.

JLG training simulators run on multiple platforms including iPad, laptop, and VR-enabled real-world simulators. Recently ForgeFX upgraded the VR simulators from the HTC Vive to the Meta Quest platform, which provided enormous benefits in the form of non-tethered hand tracking and improved responsiveness between the operator and the equipment.

10 Year Partnership

Read more

CASE STUDY: VERMEER CORPORATION

HDD Fundamentals

With infrastructure development and underground utility installations rising around the world, the need for skilled horizontal directional drill (HDD) operators is skyrocketing. To meet this growing demand, market leader Vermeer Corporation partnered with ForgeFX Simulations to develop the *HDD Fundamentals* training tool for real-world simulators combined with virtual reality via the HTC Vive platform.

The simulator features tutorials in many aspects of drill preparation including checking underground utilities, lessons in soil types and bits, and operation of the mixing machine; and substantive interactive walk-throughs of bore planning, pipe feeding, and drill operation.

Read more

CASE STUDY: GLOBAL GROUND SUPPORT

VR-Based Training

Recently upgraded from the Oculus Rift to the Meta Quest platform, Global Ground Support's VR *Deicer Simulator* is available to customers worldwide. This networked multiplayer VR training simulator allows for safe, effective and cost-cutting training. Trainers have the ability to generate more than a million different situations for their trainees, choosing aircraft model and detailed environmental conditions: temperature, wind speed and direction, precipitation level and type. The simulation teaches equipment operators year-round to use GGS deicers quickly, with more flexibility and at a lower cost than traditional training. No real-world equipment is taken off the line and no expensive consumables, such as fuel, oil and deicing fluids, are required.

Read more

CASE STUDY: CATERPILLAR

Excavator Operation and Maintenance Training

The *CAT All Access Pass Experience* simulator is a robust training and sales tool for the 308 model Mini Excavator. It is intended to be used by both showroom sales teams and the end consumer who wants to practice operation of the machine. Inside either American or Mexican environments, the user can choose from a wide menu of activities including control familiarization, hammer and basket tutorials, and even a game of skill in the arena.

More importantly, the simulator includes both machine inspection and maintenance walk-throughs. The user is guided step-by-step through these crucial and complicated tasks on a highly detailed virtual model of the excavator to ensure comprehension of the many elements required.

Read more

CASE STUDY: GE HEALTHCARE

GE HealthCare

AR-Based Training

ForgeFX developed several virtual training simulators products for GE HealthCare, including applications for MR, CT and Vascular services field engineers. These training simulators allow GE Healthcare technicians to train for the technical maintenance of diagnostic imaging apparatus on a standard computer, without the need for access to the real-world equipment. Trainees use the simulator to learn how to conduct the corrective and planned maintenance procedures and practice these tasks associated with each piece of equipment.

Read more

CASE STUDY: JPEO-CBRND

RENDR Tele-Op Simulator

This unmanned vehicle teleoperation training simulator was developed by ForgeFX Simulations and MRIGlobal for the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (JPEO-CBRND). The JPEO-CBRND is responsible for the development, acquisition, fielding and life-cycle support of chemical, biological, radiological and nuclear defense equipment and medical countermeasures. The training simulator allows soldiers to learn how to operate the unmanned vehicle, along with the suite of sensors it contains.

Read more

CASE STUDY: PIERCE MANUFACTURING

Heavy-Duty Sales Tool

ForgeFX Simulations is honored to be a simulation development partner for Pierce Manufacturing, one of the largest fire apparatus producers in the world. ForgeFX worked with Pierce to develop the *Pierce Ascendant® 100 Heavy Duty Aerial Tower Fire Truck Simulator* for real-world simulators combined with virtual reality via the HTC Vive platform. Pierce is an Appleton, Wisconsin-based manufacturer of custom fire and rescue apparatus and a wholly owned subsidiary of Oshkosh Corporation. ForgeFX is proud to be a simulation development partner with Oshkosh for more than five years, currently supporting their Pierce Manufacturing and JLG Industry brands, by providing simulation development services for a wide array of equipment and trucks across industry sectors.

Read more

CASE STUDY: FEDEX

Airport Ramp Safety Training

For FedEx, ForgeFX developed a productivity- and safety-focused simulator geared towards training freight handlers. There are various scenarios in which the trainee must indicate the safest procedure in a particular situation. After the trainee has made their choice, they watch an animated cut scene which illustrates the results. Proper choices result in efficient, effective, safe, and successful completion of the operation. A visceral demonstration of unsafe practices is the result of incorrect choices.

CASE STUDY: KOMATSU

KOMATSU

Mining Equipment Simulations

ForgeFX is a proud partner of P&H Mining Equipment, a subsidiary of Komatsu. P&H Mining builds and supports a line of drilling and material-handling machinery for surface mining operations worldwide.

By providing a range of training simulators for underground longwall systems, surface mining equipment, and heavy earth movers, ForgeFX has established expertise in the creation of virtual training environments for complex machinery. Each of these custom simulators run on both desktop computers and real-world physical control stations.

Read more

SIMULATOR TECHNOLOGY

ForgeFX employs the latest tools to for creating the best possible simulators. Packages such as 3D Studio Max, Maya, Substance 3D, and Unity help us create AAA-quality graphics in our simulators. These tools also help us adjust our artwork for low-resolution platforms to high-end gaming computers all within the same project.

ForgeSIM™ FRAMEWORK

ESSENTIAL BUILDING BLOCKS OF THE TRAINING SIMULATOR

ForgeFX's many years of simulator development has given us a tried-and-true methodology which is the framework on which we build our projects. This established methodology ensures that each simulator we create is not only reliable but also tailored to meet the specific needs of our clients. By incorporating real-world operational data and feedback into our design process, ForgeFX delivers simulators that provide practical training value and a high degree of realism, ultimately enhancing the learning outcomes and operational efficiency for our customers. Here are the elements of the framework:

ForgeSIM™ CORE: Our core re-useable application framework enabling rapid development of fundamental application flows, based on a rock-solid foundation.

ForgeSIM™ CONNECT: Proprietary process and approach to bridge the gap between static machine and equipment CAD files to their interactive counterparts, matching real-world behaviors.

ForgeSIM™ CONTROL: Pre-built system to connect real-world equipment controls to ForgeSIM-based applications. Protocol support includes both custom and standard CAN-BUS systems.

ForgeSIM™ TRACK: Sophisticated system which granularly tracks both raw user actions and client-specified higher-level performance assessment and reporting criteria.

ForgeSIM™ GATHER: Time-tested multiplayer framework designed specifically for the team-based practice and instructor/student modalities required for simulation-based training.

GAME ENGINE TECHNOLOGY

LEVERAGING A WINNING STRATEGY

The game engine is a software framework designed for the creation and development of video games. Video game developers use them to create games for video game consoles, mobile devices and personal computers. Simulations have many vital elements in common with games and their development processes:

- Interactive 3D Environments
- Task-Based Scenarios
- Scoring Mechanisms
- User Performance Monitoring
- Distribution Methods

For this reason, ForgeFX uses Unity, the dominant global game development software. More games are made with Unity than with any other game technology. We use game engine technology to produce our 3D simulations and visualizations because they are an incredibly efficient development environment with which to produce high-quality, enterprise-grade interactive 3D applications.

CASE STUDY: CATERPILLAR

ForgeFX developers enjoy injecting a simulated environment with all the little details that bring it to life and increase the feeling of immersion. Subtle effects such as trees swaying, birds flitting overhead, and cows mooing help the user feel as if they are in a real-world situation.

PROGRAMMING TOOLS

WHERE CODE AND EFFICIENCY ALIGN

Our programmers, responsible for writing the low-level code used by the rest of the team, rely upon state-of-the-art tools to do their work.

We use the C# programming language which is a modern and well-structured programming language that is memory managed, making it lightweight and portable. C# is a popular programming language known and used by many people around the world. This provides for a large and highly-talented pool of developers from which to choose team members.

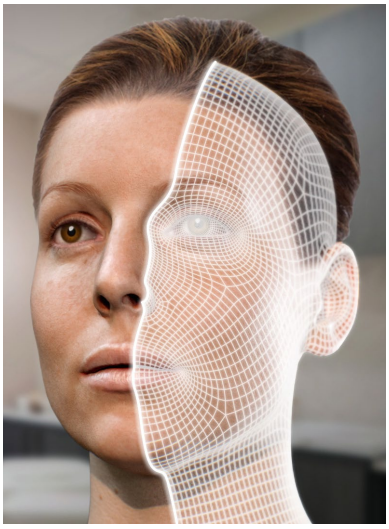
We use an enterprise-grade code editor, Visual Studio, which allows us to rapidly and effectively write, integrate, test, and deploy efficient programmatic code and applications. Relying on enterprise class software ensures that your application is customizable, powerful enough to scale up when required, open and compatible with existing databases and protocols.

The Microsoft.NET platform library consists of reusable components that help developers rapidly and graphically create applications. This directly translates to an increased return on investment. The framework has global support and has a huge community of developers generating resources, sample code, and specialized components that perpetually increases productivity. Having such a massive pool of .NET developers allows us easy access to skilled developers when their expertise is required on a project.

Microsoft® .NET

ART PRODUCTION TOOLS

THE ART OF 3D SIMULATION



ForgeFX uses many of the industry-standard development tools that are used to create high-fidelity applications. It is the combination of high-quality 3D graphics — and all the sub-disciplines that are required to create them — with well-written code that allows us to create simulation and visualization products. Compelling 3D graphics are a requirement for realistic and effective simulators, not just a bonus. Whether we receive highly-detailed CAD models of the equipment to be simulated, or we create models from scratch based on images, videos, operator manuals, and physical measurements, we always succeed in building highly realistic virtual representations of real-world equipment which we bring to life in our simulation engine.

3D

Most of the work we do creating 3D models, such as rigging them to mimic real-world movements, animating them to move, and painting them with textures, is done within Autodesk 3D Studio Max. We have been using this tool for close to two decades as it has become the industry standard 3D graphics program over the past 25 years.

2D

Another tool that we rely heavily on for the 2D graphics side of development is Photoshop, along with other essential tools in the Adobe suite of products. It is the de facto industry standard tool for designing, creating, editing and deploying 2D graphics.

CROSS-DEVICE DEPLOYMENT

ONE BUILD, MULTIPLE DEVICES

The ability to author an application one time, and then deploy it to multiple types of devices cannot be understated. With minor modifications, entire software application frameworks can be exported to many different types of device formats, allowing software produced by ForgeFX to be used by the widest possible audience. This flexibility extends to the realm of immersive technologies, with ForgeFX pioneering the development of training simulators for cutting-edge VR, AR, and MR platforms.

Similarly, the ability to run applications on multiple platforms can be a major selling point all on its own. Gone are the days of applications running only on Windows or Mac. Modern day users expect, and oftentimes require, that their software run seamlessly on multiple platforms. Using the Unity Game Engine to produce and deploy our applications for clients allows ForgeFX to offer application deployment options to our clients from a long list of platforms, including Windows, iPad, Android, PlayStation, Blackberry, Linux, and even a browser-based WebGL version, as well as on VR, AR, and MR platforms, which are quickly setting new standards in training and operational efficiency.

CASE STUDY: JLG

Over several years of developing training simulators for various types of JLG equipment, from the world's tallest 1850SJ telescopic boom to the durable scissor lift, ForgeFX has accommodated JLG's need for simulators to run on motion platforms in VR, on desktops, and on iPads.

PHYSICS & PARTICLE SYSTEMS

ELEMENTS OF ENGAGEMENT

The primary benefit of using simulators for training is in how closely they emulate real-world equipment and operation. ForgeFX takes pride in accurately replicating the experience of using physical equipment in the real world. We use CAD and other engineering files, physical measurements, and on-site reference photos and videos to capture the exact dimensions of the equipment and its surface textures.

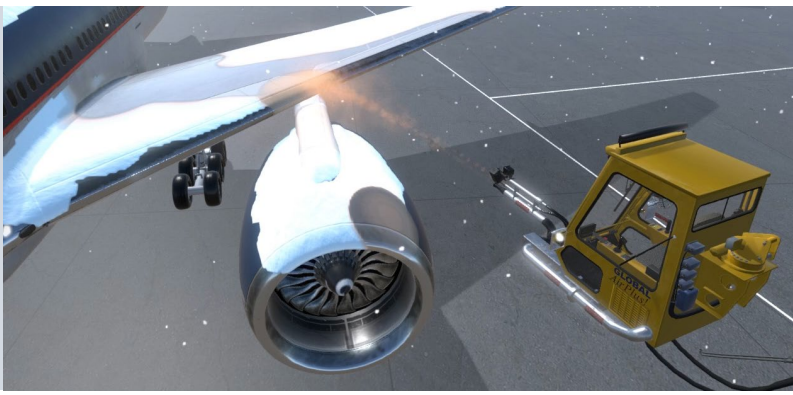
The same CG effects and animations that enliven premier video games are employed to recreate fluids, gases, and other natural physics. This is especially relevant in simulating operations involving physical materials. Examples include:

- Mining Simulator: dust, debris
- Deicing Simulator: fluid dynamics, weather effects
- Construction Simulator: sparks, dust, smoke

Our game engine provides a built-in physics engine, NVIDIA® PhysX®, which allows for convincing physical behavior of virtual objects within the 3D environment. PhysX handles all aspects of physics within the application, everything from gravity, to acceleration, to collisions.

CASE STUDY: GLOBAL GROUND SUPPORT

Particle systems and fluid dynamics were crucial areas to simulate accurately in this deicing simulator. Snow, rain, and different types of liquids all played a part in providing accurate training conditions.



CHARACTER ANIMATION

THE POWER OF PRESENCE: LIFELIKE AVATARS

Anyone who has played a video game produced in the last 10 years probably noticed that virtual characters have come a long way since the early days of “Tomb Raider.” Not only are virtual humans, or avatars, ubiquitous in modern video games, but the quality at which they are produced, rendered, and animated has improved significantly.

ForgeFX utilizes the high-quality human models as avatars and agents to increase the level of verisimilitude in our simulators and thus boost the quality of education and learning retention for both users and learners.

In the realm of interactive multi-user training simulations, the role of accurately designed avatars cannot be overstated. As ForgeFX continues to push the boundaries of immersive training, the growing importance of creating authentic avatars for both AI agents and human participants stands at the forefront of our design philosophy.

The evolution of avatars goes beyond aesthetic appeal; it encompasses the nuances of human expressions, movements, and interactions that make the training environment more relatable and engaging. Accurate avatars facilitate deeper emotional and cognitive connections, which are crucial in scenarios that require teamwork, empathy, and decision-making skills that mirror real-life situations.

By embodying realistic characteristics, these avatars act as extensions of the users, allowing for a seamless blend of learning and practice. This not only enhances the realism of simulations but also encourages better knowledge transfer, retention, and application in the real world. ForgeFX is committed to leveraging cutting-edge technology to refine the fidelity of these avatars, ensuring they serve as effective participants in complex training ecosystems.

MULTI-USER INTERACTION

EXCELLENCE THROUGH COLLABORATION

Increasingly, corporations and schools are turning to virtual reality simulation-based instruction to enhance and expand upon their in-person training curricula. ForgeFX easily accommodates the need for multiuser capability by employing Unity's integrated development tools. These off-the-shelf applications ensure that our simulators meet the latest industry standards at any point in time and allow us to provide flexible and powerful solutions to our clients.

Because multiuser capabilities accommodate many valuable kinds of person-to-person interactions such as tutoring, classroom sessions, and cooperative learning and working, ForgeFX is always ready to provide this solution in our simulations. Additionally, the real-time interaction allows for immediate feedback and dynamic scenario adaptation. This means that participants can benefit from personalized guidance and instant performance assessment, which is crucial for skill acquisition and reinforcement. By fostering an interactive learning environment that responds to the actions and decisions of the users, ForgeFX simulations create an engaging and efficient educational experience that can adapt to the diverse needs of learners.

CASE STUDY: CHECKPOINT

Winner of a JPEO Spark Award, ForgeFX's Checkpoint AR Tabletop Mission Planner for Microsoft HoloLens 2 allows users to plan and visualize interactive mission scenarios. The application supports collaborative planning by enabling multiple participants to view and interact in the shared AR space, enhancing the strategic utility of this innovative mission planning tool.

ARTIFICIAL INTELLIGENCE

ANTICIPATING THE FUTURE OF TRAINING SIMULATIONS

ForgeFX Simulations is at the forefront of cutting-edge technological research and implementation, delving deep into the realms of artificial intelligence. Our exploration spans two primary domains: virtual avatars enhanced with natural language processing capabilities; and machine learning, where algorithms autonomously improve upon tasks by processing vast amounts of data. By merging the power of these two AI domains, we aim to revolutionize the way users experience digital simulations, creating environments that are more intuitive, responsive, and lifelike than ever before.

AI Experts

In our ForgeFX Showcase application for the Meta Quest, we implemented autonomous avatars that can act as sales representatives or subject matter experts about the excavator. Using natural language processing, these avatars can respond to and interact with users in an impressively human-like manner. The combination of an AI Expert in a multiuser-capable simulator creates a highly versatile, future-forward training and sales experience.

Machine Training

Not only do humans need training for crucial tasks, but machines do as well. ForgeFX has developed a training simulator for a hypothetical autonomous JLG telehandler by utilizing TensorFlow software. TensorFlow has a comprehensive, flexible ecosystem of tools, libraries, and community resources that let researchers push the state-of-the-art in ML and let developers easily build and deploy ML-powered applications. As industries increasingly explore the employment of autonomous equipment in various capacities, ForgeFX anticipates our clients' needs in this exciting area.

META QUEST FOR BUSINESS

EMBRACE VR WITH CONFIDENCE

ForgeFX Simulations is excited to harness the power of Meta Quest for Business to offer our clients a comprehensive and streamlined VR experience. Meta Quest for Business is a subscription bundle for Meta Quest Pro and Meta Quest 2 devices that provides administrative features like user, device and application management, support, and more.

The subscription includes:

- A dedicated account manager to help you get started
- Access to a library of business-ready VR apps and experiences
- Device management tools to track and manage your headsets
- User management tools to create and manage user accounts
- Application management tools to deploy and manage VR apps
- Support from Meta experts

Meta Quest for Business is designed for businesses of all sizes that want to use VR for training, collaboration, customer service, and other applications. It is a good option for businesses that need the flexibility and control of a subscription-based solution.

Here are some of the benefits of using Meta Quest for Business:

- **Increased productivity:** VR can be used to train employees more effectively, collaborate with colleagues remotely, and provide better customer service.
- **Improved safety:** VR can be used to simulate dangerous or hazardous environments, so employees can learn without putting themselves at risk.
- **Reduced costs:** VR can help businesses save money on travel, training, and equipment.
- **Increased innovation:** VR can be used to develop new products and services, and to improve the customer experience.

PERFORMANCE ANALYSIS TOOLS

OUR COMMITMENT TO PEAK PERFORMANCE

Performance Analysis Tools are critical in ensuring the smooth operation of complex simulations and applications. ForgeFX employs these tools to meticulously monitor and analyze the performance of both the Graphical Processing Unit (GPU) and the Central Processing Unit (CPU), which are often the linchpins of application efficiency and responsiveness.

GPU Performance Analysis

Our tools can detect if the GPU is overburdened with rendering tasks by scrutinizing frame rates, shader complexity, texture loads, and polygon counts. Excessive detail in a simulated scene can lead to slow render times, reduced frame rates, and ultimately a subpar user experience. We optimize rendering pipelines, employ level of detail (LOD) strategies, and adjust graphical settings in real-time to ensure that visual quality does not compromise performance.

CPU Performance Analysis

CPU bottlenecks can stem from multiple sources such as real-time physics calculations and intricate logic operations. Our tools break down the CPU's task execution to pinpoint inefficiencies. By profiling the CPU's workload, we can optimize algorithms and streamline code execution to alleviate any undue strain on the processor.

Our objective is to deliver a high-performance product that operates seamlessly across a wide range of hardware specifications. We understand that our clients depend on the smooth functioning of our simulations for their operational success. Therefore, we are committed ensuring that our applications not only meet but exceed the expectations of high fidelity and responsiveness.

LMS INTEGRATION

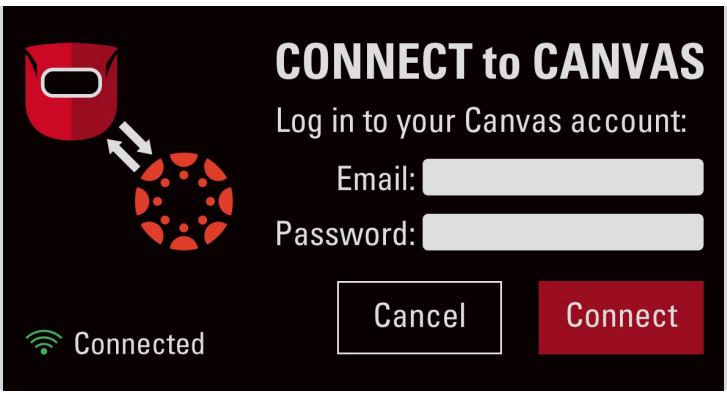
USING DATA TO SHAPE THE PERFECT CURRICULUM

While the training simulator is running and a simulation session is in progress, we collect detailed information about every action, step, and misstep a student makes. After a scenario session is completed, these performance metrics are provided to the student in the form of an onscreen performance report; to the student's instructor; and captured and uploaded to the relevant server as well. This component's data can be stored and transmitted in a variety of industry-standard formats in order to integrate with the LMS which we often include with simulation. ForgeFX works with clients to determine their LMS requirements, and based on that information, we select a commercially available LMS product such as MOODLE, Blackboard, Canvas, or iSpring.

ForgeFX most recently integrated our OcuWeld simulator application with StrataTech's LMS, Canvas. We also have experience in developing custom LMS tools for clients including JLG Industries and GE Healthcare.

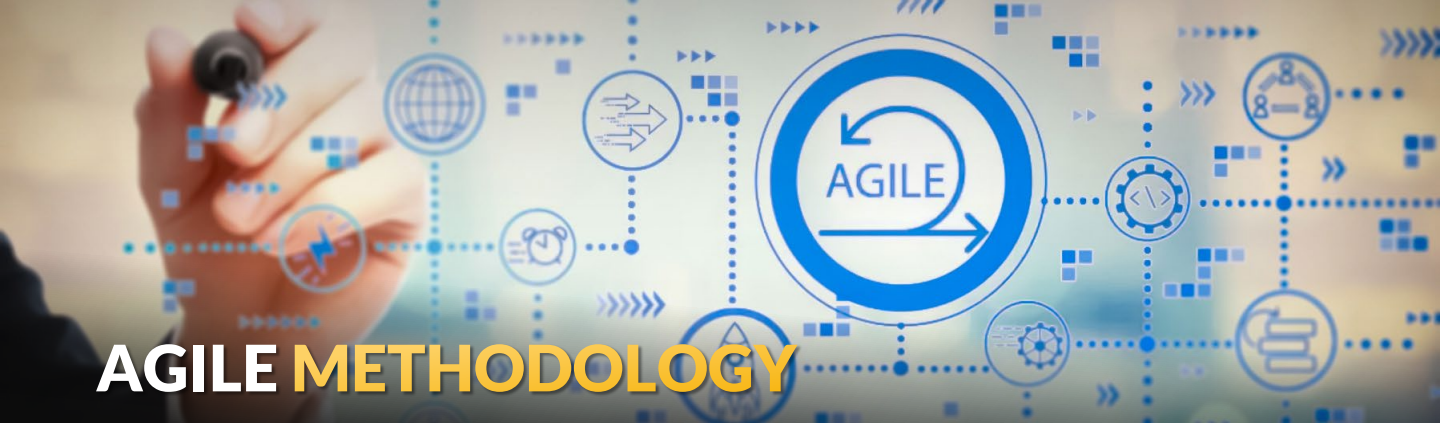
CASE STUDY: CANVAS FOR OCUWELD

ForgeFX has proven expertise in developing simulators that integrate effectively with existing systems, as exemplified by StrataTech's OcuWeld project which allows trainees to login to their Canvas LMS account.



DEVELOPMENT PROCESS

In over two decades of working with clients, we've found that an agile, iterative, and transparent development process works best. We provide our clients visibility into every step of the development process, including features as they are being developed. This allows for quick course-corrections and ensures that development stays headed in the right direction.



AGILE METHODOLOGY

A CULTURE OF CONTINUOUS IMPROVEMENT

We follow an agile development process: a practice of delivering fully functioning application builds every two weeks for review. At each review we meet virtually via conference call and shared desktop to assess the progress made over the preceding month, discuss the current prioritized feature list, and determine requirement details for the features to be developed over the course of the next two weeks. In the agile process each one-month block of development, called a sprint, looks like this:

Sprint Planning: Review the prioritized feature list, possibly reprioritizing, adding, or removing features based on what we learn as development progresses and clients give their feedback.

Sprint: The development team works for two weeks developing the discussed features.

Sprint Delivery: At the end of each two-week period, we upload the latest build for download and review.

Sprint Review Meeting: Review of progress from the prior two weeks and feedback collection. Revisions based on this feedback will be candidates for completion in the following sprint.

TASK TRACKING & STEPS

STREAMLINING SUCCESS

A Kanban board is a powerful project management tool designed to help visualize work, limit work-in-progress, and maximize efficiency (or flow). Kanban boards use cards, columns, and continuous improvement to help technology and service teams commit to the right amount of work, and get it done.

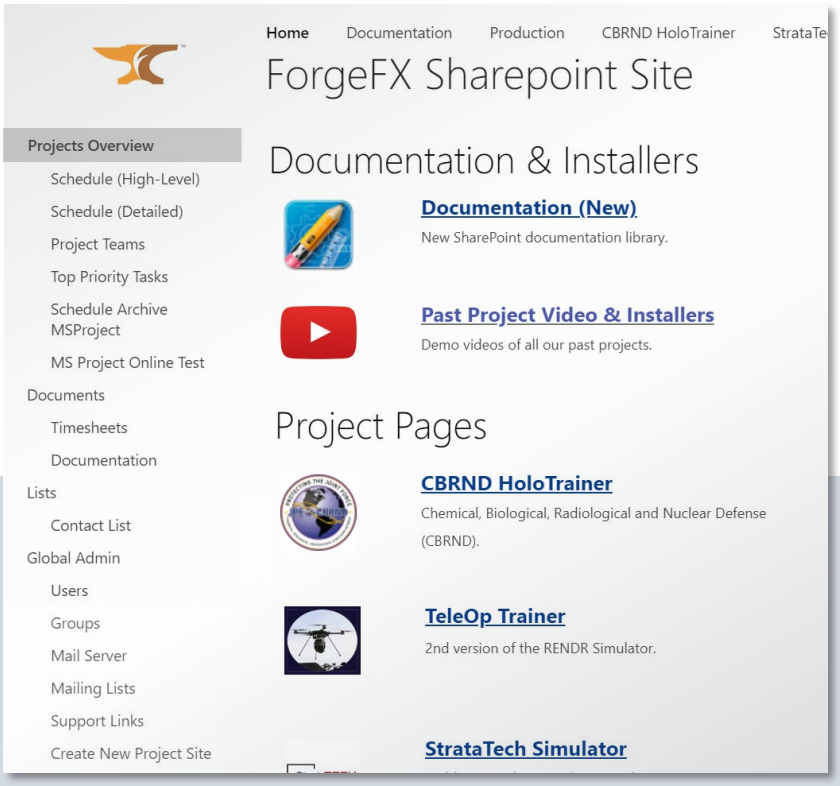
For each task to be completed and feature to be developed, we follow a consistent process. This structured process ensures development efficiency; that the right features are being developed; and that the features that are developed and delivered are bug-free. Here are the end-to-end steps involved to implement a project feature:

1. Requirements gathering, specification and documentation
2. Implementation plan and task assignments
3. Implementation (i.e., asset creation, coding, etc.)
4. Delivery for review
5. Review and feedback gathering
6. Revisions based on feedback
7. Re-delivery, re-review, and final approval
8. Testing and quality assurance
9. Bug fixing
10. Deployment

INTRANET/EXTRANET

COLLABORATION WITHOUT BORDERS

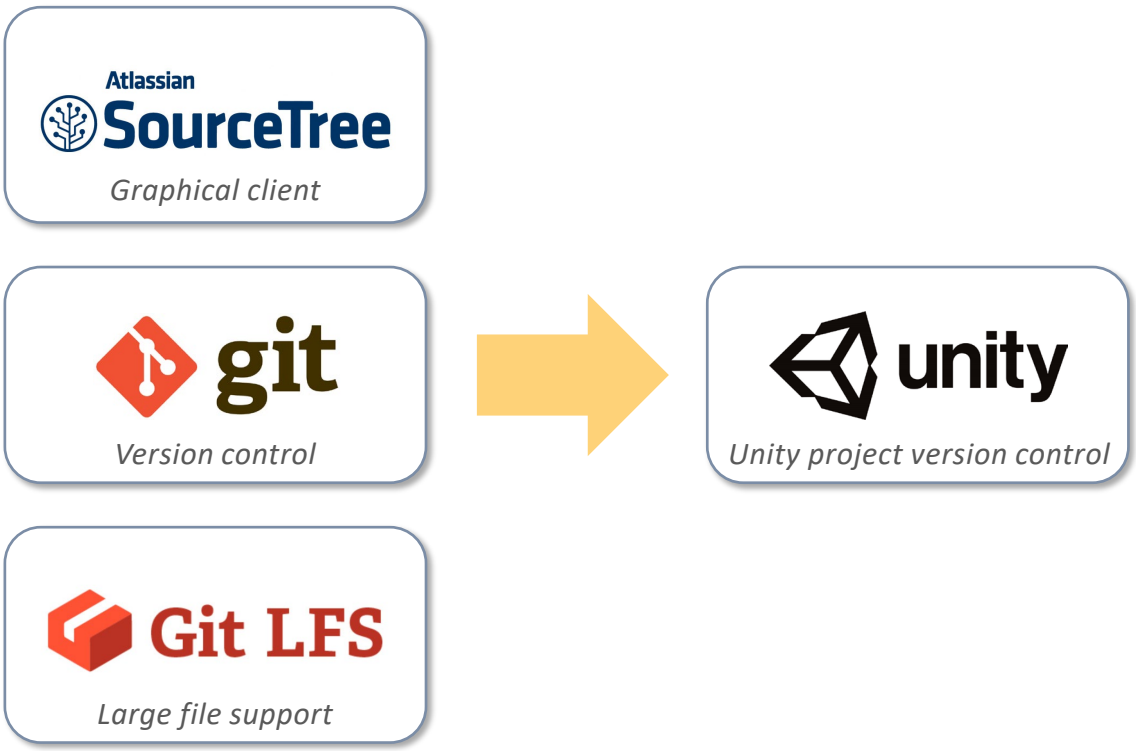
ForgeFX relies heavily on a sophisticated intranet/extranet. The product we use is Microsoft SharePoint, which is geared to support large project teams, and is particularly helpful in keeping our developers coordinated. SharePoint allows us to collect and maintain project documentation in a centralized way. We also use it to store our review content which is delivered once per month. Most importantly, we take advantage of detailed task tracking capabilities to ensure that client requests are tracked, assigned and completed systematically.



SOURCE CONTROL

ENSURING SYNCHRONICITY

ForgeFX uses mature development methodologies including source control. In this type of arrangement, every increment of code and art assets developed are automatically submitted to a central online secure repository. The benefits of source control extend beyond maintaining file backups. This discipline enhances communication between team members and project managers by providing visibility into what everyone is working on at a granular level.



CONTINUOUS INTEGRATION

INSTANT UPDATES FOR IMMEDIATE ACTION

Standing on the shoulders of our rigorous source control system is our continuous integration process.

Our backend servers automatically watch for code and art asset contributions to source control. When these are detected a fresh build of the entire application is kicked off. An automatic email alert is sent to the team if any contribution causes an issue, and which would otherwise slow down the team.

Additionally, the process of producing multiple functioning builds per day means that there is always an up-to-date functional build available for anyone on the team, including our clients, to review.

QUALITY ASSURANCE TESTING

PRESERVING EXCELLENCE AT EVERY STEP

To develop a robust application which is both reliable and supportable we follow a series of best practices that we have developed over the years.

The first piece of this puzzle, which occurs during development of the application, is **automated unit testing**. With each incremental change made to the application, we automatically run a suite of comprehensive tests which ensure that new features have not negatively impacted existing features.

The second piece that facilitates application support, after deployment to users, is our **automated error reporting**. The application, with end-user permission, sends us performance and issue telemetry which allows for detection and correction of issues in the deployed application.

Finally, we include the capability for both trainers and end-users to **manually submit feedback** from within the application, including a screenshot of the relevant item. This closes the loop for end-to-end reliability and support systems.

We perform Usability Testing to evaluate how usable the application is by our users. Throughout the course of the development of the product, we ask people who have never seen the application use the software, to determine how user-friendly it is. This type of testing gives us direct input on how users will be able to navigate and use the system.

These testing protocols are paramount to the to the success of our simulators, as we often uncover simple course corrections that we can perform to make the application more useable, and thus more successful.

DEVELOPMENT MILESTONES

This chart illustrates the several stages of development that the project will pass through on its way to completion and delivery.

Team introductions and project initiation		**KICK-OFF**
PRE-ALPHA		25% feature-complete application
50% feature-complete application		**ALPHA**
BETA		75% feature-complete application
99% feature-complete application		**RELEASE CANDIDATE**
GOLD MASTER (GM)		100% feature-complete application

RETURN ON INVESTMENT

It can be expensive, impractical, and sometimes even dangerous to provide trainees with direct experience using actual equipment and instructors in real world locations. These costs and risks can be limited without sacrificing results by using simulations to provide virtual hands-on experience and training.

PRODUCT OWNERSHIP

ONE COST, INFINITE POTENTIAL

Our clients own all the assets that we create for their projects. ForgeFX Simulations develops all assets in non-proprietary development tools, which ensures that you are not locked into any specific platform and have the freedom to modify, update, or expand your projects as needed.

One-time development cost: We believe in straightforward financial transactions without hidden fees. This means that when you commission a project with us, you're charged only once for the development of your assets.

No licensing: With ForgeFX, you don't have to worry about ongoing licensing fees for the assets we develop for you. Once the project is completed, the assets are yours to use as you wish, free from any additional licensing costs that can often accumulate over time.

No per-seat costs: Whether your team is large or small, our development approach does not include per-seat costs. This ensures that your entire team can utilize the assets without incurring additional charges based on the number of users or seats, facilitating a more collaborative and inclusive environment.

ForgeFX takes pride in fostering long-term relationships that span many years with our clients. Our comprehensive range of services includes initial consultation to understand your vision, bespoke design and development tailored to your unique requirements, as well as ongoing maintenance and support to ensure longevity and success for your projects.

SIMULATOR
RETURN ON INVESTMENT

When considering any project, it's important to determine the return on investment so that stakeholders know where the money is going and what they can expect to receive in return. Simulators are no different, and the ROI can be significant. Listed below are the leading benefits of utilizing simulation-based training and the associated returns.

- **Reduced Wear and Tear on Physical Equipment**
  By conducting portions of training on simulated equipment, there is less wear and tear on real-world equipment and a reduced incidence of accidents and their associated repairs.
- **Reduced Use of Consumables**
  Simulators require zero fuel, oil, or other materials to be used in training. Conducting training without the expense of consumables greatly decreases the cost of training.
- **Knowledge Retention and Transfer**
  A training simulator can be designed to capture the expertise of subject matter experts or senior employees, replicating their decision-making processes and actions and allowing others to learn from their experience. By embedding best practices into the simulator, an organization ensures that all employees are trained in the same way. This can help to standardize operations and improve overall performance.
- **Increased Operator Familiarity**
  Training with physical equipment will always be necessary; however much of the basic training can be conducted within the simulator so operators are familiar with the equipment before real-world training begins. They can practice a procedure or task over and over until they've mastered it, acquiring mastery without incurring expenses or risking injury.
- **Reduce Travel Time & Expenses**
  Getting access to real-world equipment can be costly and time consuming. Removing the need for trainees to travel can quickly have a positive effect on a company's bottom line.
- **Increased Throughput**
  Most companies struggle with throughput of trainees. There are only so many trainers, accessible equipment, and hours where training conditions are optimal. Simulators remove these barriers and allow trainees to train regardless of trainer or equipment availability; and remove any physical limitations that are out of an organization's control.
- **Sales and Marketing Opportunities**
  While simulators are typically built for training departments, sales and marketing departments love them because they provide excellent opportunities to put people behind the controls of a virtual machine in a setting where that is not possible with real-world machines. People want to try before they buy, and simulators give customers that ability.

BENEFITS OF DISTRIBUTED DEVELOPMENT

ForgeFX Simulations was founded as a virtual company performing distributed development for clients to produce commercial-grade software applications. The founding partners of ForgeFX had worked together for years at video game companies and internet application development agencies before founding ForgeFX Simulations. ForgeFX's vision is use off-the-shelf middleware video game engines to produce high-quality interactive 3D simulation software that can rapidly be designed, developed, and deployed through both offline and online channels.

Savings

We don't maintain a brick-and-mortar office which keeps our overhead lower, a saving we pass along to our customers. We don't have secretaries, receptionists, human resource people, or other levels of infrastructure that needs to be accounted for in our budgets. Instead, we've architected a system that allows all our team members to work from their locations but always connected to our secure online internet-based set of development tools that allow for tight team member communication, collaboration, and production—at a reduced budget, which is benefits our client.

Around-the-Clock Development

Having developers on both the east and west coasts of the United States allows our workday to stretch beyond the typical 9-5 hours. In fact, our typical development day is much longer than that; with our development teams spread across the time zones from South Africa to Hawaii, we're able to extend typical workdays to squeeze as much time as possible out of compressed project schedules.

About ForgeFX

From the time Greg, Adam, and David founded ForgeFX in 2002, the company has produced innovative educational and job-training simulations. The three founders actively oversee every project that ForgeFX develops, leading dozens of projects from concept to completion and delivery.

COMPANY STRUCTURE

CORE VALUES OF EFFICIENCY AND ENTHUSIASM

We hope that this proposal has demonstrated our commitment to providing the very best quality training for the individuals who will put their lives on the line in service to the safety of others. We strongly feel that virtual reality simulators such as the ones we develop are a highly effective solution for training first responders thoroughly and meaningfully while preserving their own safety and avoiding costly accidents.

ForgeFX has a long track record of developing and delivering high-quality training simulations for our clients. We follow an agile development process which allows for both flexibility and predictability. Through maximizing efficiency and minimizing development costs which do not directly contribute to the quality of the end-product, we are able to deliver a remarkable level of affordability. We leverage and build upon the constant advances in video game development tools technology for the benefit of our clients. Our leadership team is tight-knit, passionate, and works directly with each of our clients.

All of this taken together makes ForgeFX uniquely qualified to develop simulation-based training for your organization, and we look forward to your response to our proposal and hopefully to working with you to produce your simulator.

Thank you for your interest in our development services, and please contact Greg Meyers if you have any questions and to discuss next steps.

Company Leadership

Executive Team

GREG MEYERS

CEO and Project Executive Producer

As Executive Producer for projects, Greg establishes and manages client relationships and develops and negotiates project scope and contracts. During projects, both the technical and art team leads report to him. As projects progress, necessary changes to the project scope inevitably arise; Greg works with clients to facilitate these adjustments to initial project agreements.

Prior to founding ForgeFX, Greg was a front-line participant in the landmark dot-com era, working at digital content development agencies; these included Sapient's Rich Media Group and before that, the ad agency Red Sky Interactive—one of the world's most-awarded agencies at the time. Greg also served as Technical Director at Human Code, an Austin Texas based Video Game Company.

Company Leadership

Executive Team

ADAM KANE

CTO and Project Technical Team Manager

As Technical Team Manager for projects, Adam's technology and tools research informs the technologies and tools decisions for all of our clients' projects. He presents options, communicating in clear terms the pros and cons in order to arrive at the technical plan for each project. Throughout the project, Adam manages his staff of programmers to translate project-design documentation into code and a realized functioning application.

Prior to founding ForgeFX, Adam gained his technical and team management background working with Greg at both award-winning dot-com startups Red Sky Interactive, as well as global services companies such as Sapient consulting. Before that, Adam ran the Haas Media Lab at UC Berkeley. Throughout his career, Adam has maintained a consistent focus on the development of high-fidelity, interactive, 3D-graphics simulations and visualizations.

Company Leadership

Executive Team

DAVID VAILLANCOURT

COO and Project Art Team Manager

David's role as Chief Operating Officer encompasses a broad range of responsibilities essential to the smooth operation of the company. He manages all accounting functions, including budgets and payroll, ensuring financial health and compliance. In addition, David contributes to the research and development efforts at the company, spearheading the creation of custom hardware solutions tailored to meet our clients' specific simulator needs. This includes overseeing the technical and design aspects of projects, where he leverages his extensive background in both creative and operational capacities.

David also engages with the creative process, providing strategic oversight and direction to our art production staff. He plays a pivotal role in project review meetings, presenting innovative design alternatives and integrating client feedback into actionable tasks for his team.

Prior to stepping into his role as COO, David co-founded ForgeFX and held the position of Chief Creative Officer. His early career was marked by pioneering work in real-time interactive 3D web graphics, a testament to his long-standing expertise and visionary approach to technology and multimedia. David's unique blend of creative and operational leadership continues to drive the success and innovation at ForgeFX.

Project Team Leads

ForgeFX development team leaders

SCOTT LAFORGE | Chief Product Officer

Scott provides architectural solutions and designs, assessments, strategies, and road maps. He defines product ideas, iterates on those product ideas, and formulates a vision. He defines functional requirements for software products to fulfill the envisioned ideas and interacts with other cross-functional teams to architect, design, develop, test, and release features and final products.

Mary Pierce | Executive Director of Enterprise Partnerships

Mary spearheads strategic collaborations with organizations across a wide range of industries. Her primary objective is to address critical training, operational, and educational requirements within these industries by leveraging ForgeFX's expertise in developing custom, immersive, and interactive simulators. Mary has nearly 20 years of experience managing complex portfolios, leading cross-functional teams, and establishing and maintaining customer partnerships to meet strategic business objectives.

GENEVIEVE MOORE | Chief Creative Officer

Genevieve is an award-winning interactive designer who oversees the user interface design of our products. Bringing over 20 years' worth of design experience for multiple platforms, she ensures that our simulators reflect the branding and positioning of our clients, while keeping them intuitive and easy for their customers as well.

Project Team Leads

ForgeFX development team leaders

RIVER COX | Technical Program Manager

As the technical program manager at ForgeFX, River orchestrates the implementation of products across multiple disciplines. River is responsible for ensuring the timely and stable execution of product requirements and deliverables. He works closely with individual contributors to ensure the team is well prepared, trained, and coordinated to meet the unique requirements and challenges of each delivery.

DEVIN WEIDINGER | Senior Software Architect

A virtual reality enthusiast and passionate developer for Mobile VR, Devin enjoys rapid prototyping and proving theories one demo at a time. When he's not working, he's still working—breaking new ground for the future of virtual reality. His interests are new technologies, drawing, programming, virtual reality, software development and competitive gaming.

RACHEL CALGARO | QA Manager

Rachel oversees the quality assurance process at ForgeFX. As QA manager, Rachel and the QA team works closely with the development team throughout the production of each simulator we create, testing the application as it gets built to ensure a bug-free delivery. Rachel's attention to detail and methodical testing and reporting methods guarantee that upon release, your software will work as expected, without issue.

Project Specialists

Development Team

ForgeFX has taken the care to develop a team of professionals across a wide set of talents, who collectively follow the creative thought process of interactive 3D simulation and visualization development from inception all the way through to deployment.

3D Graphics Specialists

Our modelers excel at re-creating practically anything under the sun, from sweeping landscapes to the smallest internal parts of medical imaging equipment. The backbone of our realistic simulators is the verisimilitude that our modelers deliver, scrupulously replicating both the physical features and the kinetic properties of our clients' products.

Game Engine Specialists

To bring our 3D models to life, we rely on our code developers to duplicate the physical functions and interactive details in response to the users' actions. They program the responsiveness of hydraulics to the actions of the joystick; the particle physics of fluids, gases, soil, and metal; create the soundscape generated by engines and environments; and clone the interface functionality of clients' software.

Development Tools Experts

Behind the scenes but essential to our development process are the specialists who maintain the superstructure that interconnects the various departments. Our experts maintain our schedules, administrate our Kanban task boards, perform quality assurance testing, and expand our internal ForgeSIMTM Framework capabilities.

IN CONCLUSION

Some final thoughts about this project and our hope for a successful cooperative venture with your organization.

LOOKING FORWARD

A FUTURE BENEFICIAL PARTNERSHIP

We hope that this document has demonstrated our commitment to providing the very best quality training for trainees across various industries who often face hazardous situations. We strongly feel that virtual reality simulators such as the ones we develop are a highly effective method for conducting comprehensive and impactful training. This immersive technology is key in enhancing safety protocols and reducing the incidence of expensive mishaps.

ForgeFX has a long track record of developing and delivering high-quality training simulations for our clients. We follow an agile development process which allows for both flexibility and predictability. Through maximizing efficiency and minimizing development costs which do not directly contribute to the quality of the end-product, we are able to deliver a remarkable level of affordability. We leverage and build upon the constant advances in video game development tools technology for the benefit of our clients. Our leadership team is tight-knit, passionate, and works directly with each of our clients.

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