About me

I am a skilled visual effects artist with 5 years of education and hands-on experience in various disciplines, including simulation, animation, toolmaking, look development, texturing, rendering, compositing, video editing and modeling.

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Personal information

Name: Vadim Pukhov
Age: 38
Place of Birth: Saint-Petersburg
Hobbies: drawing, reading, snowboarding, surfing, creating computer graphics and visual effects

Tools

Houdini FX, Fusion, Substance Painter, Substance Designer, SpeedTree, Premier Pro, After Effects, SketchUp, Photoshop

Programming languages:

VEX, Python, C, html

Renders:

Karma, Mantra, Redshift, Arnold, V-Ray

Education

Art and Design Professional educational Institution, Saint-Petersburg
1999 – 2004
Bachelor's Degree, Design and production of art furniture

Languages

English: B1
French: A2
Russian: Native

I am deeply passionate about exploring and applying procedural and automated technologies in the VFX industry. My fascination with blending art and technology drives my work as a VFX Artist, Houdini Artist, Houdini TD, and VFX Generalist.

With a solid foundation in engineering, physics and geometry, I possess extensive knowledge across various disciplines. I strive for a deep understanding of the fundamentals, enabling me to innovate and create original work beyond mere replication. My unique blend of creativity and technical expertise allows me to think outside the box, making me particularly drawn to tools that generate art through technology.

My career journey began as an engineer, where I founded and led a successful company. I assembled a team of top professionals, and together we designed, built, and launched numerous engineering systems. 5 years ago, I discovered Houdini, and it captivated me so much that it became my primary focus and passion. I am self-motivated and able to work independently, as well as my enjoyment of collaborative teamwork where I can unite and inspire others toward common goals.

I am continuously eager to learn and enhance my skills. My enthusiasm for Houdini and other pipeline software drives me to focus on the intricate details that elevate VFX to new levels of beauty.

I am excited about the opportunity to bring my technical and creative expertise to your team, and I look forward to contributing to innovative and stunning visual effects.

Portfolio:

Creation of digital tools:

1. **Simshot 1.0**

   Link to asset's page

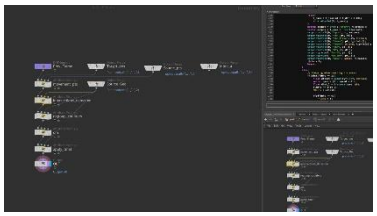
   This is a Houdini digital asset for accelerated development and setup of scenes with simulated shots from various types of weapons, accompanied by different impact effects.

   This is a highly efficient tool that allows for rapid development of scene physics involving shots and the creation of a wide variety of procedurally added effects. The tool easily integrates into various pipelines and can

handle the primary workload when creating scenes with shots across many different scenarios.

During the pre-planning stage, I researched a wealth of information on these and related topics. Unfortunately, I couldn't find anything truly useful or similar to the planned tool, so I independently conceived and implemented all the algorithms, operational principles of the asset, and many other techniques. I created this tool with the aim of enhancing the practical development experience of tools using DOP solvers within the asset, with the core functionality based on VEX and Python code.

The creation of the tool touched upon various directions, and throughout the project, I delved into a substantial amount of information regarding the intricacies of working with and interacting with RBD, FLIP, Pyro, and Vellum solvers, matrices and quaternions, caching, force and velocity attributes transfer, node execution sequence, and much more. I successfully established stable real-time interaction between different DOP networks, such as FLIP and RBD. For instance, particles from the FLIP simulation interact correctly with packed geometry from the RBD simulation and this packed geometry simultaneously serves as a collision object for FLIP simulation particles. This resembles real-time recursion with extensive possibilities for precise result adjustment, resulting in a highly realistic appearance. All calculations occur in real-time and often do not require any staged caching of simulation results. Utilizing VEX for dynamic data array manipulation allowed me to save considerable time in collision calculations, even when the incoming data had errors such as polygon overlap.

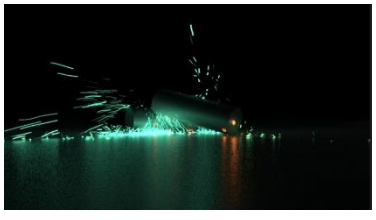


It was not a simple task, as a multitude of situations arose due to the interaction of the asset with destructible pieces of RBD packed geometry objects. This was influenced by many various factors, such as the shape of geometric objects for interaction, the angle of polygon inclination relative to the trajectory of movement, nuances when using the "*intersect_all*" function, and many others. I had to devise a universal algorithm for all possible situations, and I not only met this challenge but also implemented some additional features not initially planned in the first version of the asset.

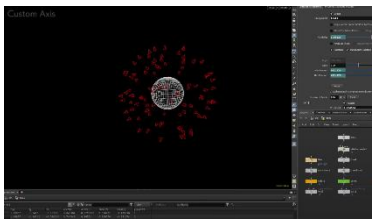
The data obtained as a result of the asset's operation, along with the presets provided in the sample file for processing the obtained results, enable the rapid creation of scenes and the application of a wide variety of effects.

While working on the project, I produced videos that you can see in the portfolio on my website.

Link to FLIP simulation scene
Link to helicopter scene
Link to sparks scene



I have created and formatted the documentation for this tool, describing all its functionalities with examples, and published it on GitHub page.
This is a free hda, and anyone interested can use it by downloading the corresponding repository.
I have received a lot of positive feedback and would like to continue developing this direction.



2. Attachto

Link to asset's page

HAD attachto creates points when the LMB is clicked in the viewport on polygonal geometry objects and attaches these points to the polygons on which they were created, inheriting all subsequent transformations of the parent polygons. By using with "CopyToPoints" SOP node this asset allows for quick and convenient attachment of instanced geometry to other polygonal geometry objects, creating groups, and controlling orientation and position relative to the parent objects.

During the creation of this tool, I gained interesting practical experience, learned a lot of useful information about working with Python within Houdini, understood the intricacies of Python code interaction with VEX within a single hda, and mastered the creation of tools interacting with the Houdini viewport. I also came up with several original solutions. I managed to devise and implement an original and efficient solutions to this troubles.

Not only did I achieve the planned goals, but I also added many additional features, successfully navigating through all the complexities and limitations encountered during the tool's creation process.

3. Mask from points:

Link to asset's page

Mask From Points 1.0 - is a Houdini SideFX digital asset for point masking, based on infection simulation (transferring mask attribute between neighboring points), allowing the creation and control of mask activators on animated objects.

The asset enables creating curves on polygonal objects by mouse click in the viewport and using these curves as attribute spreading activators between points. The created curves are attached to polygons and inherit all their transformations (if the polygonal object on which the curve is created moves, the curve will move along with it). Asset settings also allow controlling the speed and shape of mask spreading, smoothing the curves' shape, managing scatter to create masked points, applying parent transformations to these points, assigning the @orient attribute to points, and changing the rotation angle.

Projects without NDA:

1. Crush-test Mercedes-Benz GLS 580

Link to video – Crush test Mercedes-Benz GLS 580

The crash test simulation project appeared during the development of effective techniques for the procedural creation of various types of constraints with specified properties and for improving the skills of working with DOP solvers. It was a very interesting experience, I spent more than 200 hours on various experiments and created a large number of materials similar in physical properties to the materials that make up the car, such as hard and soft plastics, tempered glasses and laminated glasses, metals and metal alloys, fabrics and leather substitutes, and rubber. In the project, I used a Rigid Body solver, Pyro, and SOP solvers inside DOP, different types of constraints

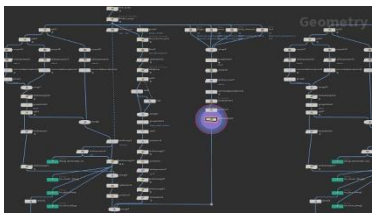
such as hard, soft, conetwist, spring and constrains dynamically changing types, UV-mapping, Mantra render.

The car model used in the project does not have power elements of the body, engine, door hinges and many other details that significantly affect the result of collisions in real tests. Therefore, I adjusted the deformation zone and the deformation force of metal elements, glass, rubber and plastic elements based on a large amount of personal knowledge about the mechanics and structure of the car and a large number of reference videos about crash tests that I viewed as part of this and the previous project.

Scene settings allow you to create constructs procedurally if you want to increase the number of geometry fragments.

The following crash tests were simulated within the framework of the same project:

Link to video – Four crush tests Mercedes-Benz GLS



There are 4 simulations in this video that differ in the values of the velocity attribute. The simulation has many controlled parameters, but the geometry of the car is controlled by changing the direction and velocity vectors.

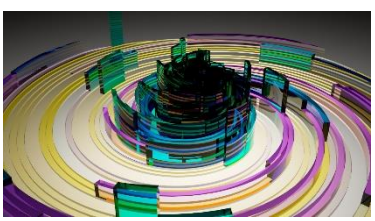
4. Generator of static and dynamic patterns

Link to video – Patterns

The main task of this project was to create a generator for flat static spiral patterns. Developing such a generator turned out to be a relatively simple task that I quickly managed to accomplish. Subsequently, within the project's development, additional tasks emerged.

One such task was to make the patterns three-dimensional. I used the generated curves to create polygons boundaries, then extruded them based on the primitive's area, and remapped a values using a ramp. Afterward, I applied the same algorithm to color. The next task was to move the created polygons along a spiral towards the center and generate a unique pattern throughout the entire timeline.

A distinctive feature of this project is that procedural movement of geometry is not a result of simulation but is entirely performed within a for-each loop, preserving the specified sequence of changes and maintains the correct execution order from frame to frame.



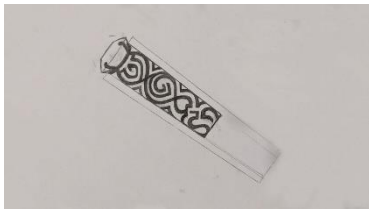
The challenge of procedurally creating, deleting, and moving a large number of polygons in for-loops without passing attribute values from the previous frame to the current one proved to be complex. However, I achieved the desired result and learned a lot while working on this project. It was a valuable experience in addressing issues like overlapping polygons, precise positioning, and correct interpolation of all necessary attributes based on @Frame values.

Experiments with template generator settings have yielded many interesting results. This generator operates quickly and offers a wide range of possibilities for generating various static and dynamic patterns.

In this project, I used various materials for rendering, but I chose glass with procedural adjustments for color and transparency levels as the primary material.

5. Jewelry

Link to video – Ring



I made this project to understand how quickly I could create installations for procedural modeling of jewelry using geometric patterns drawn on paper by graphite pencil. It took 2 days to complete the project, including the rendering time and the study of the real diamond cutting technique (only when I made the model as close to realistic in physical parameters as possible, I got a good result in the render and I liked it). The model lacks the prongs necessary to hold the stone, because the purpose of the project was the practical application of knowledge to build the process of transferring drawings from paper to Houdini and working out some practical techniques for working with a camera and light when shooting jewelry.

Tools: Houdini, Photoshop, Arnold. Animation with VEX.

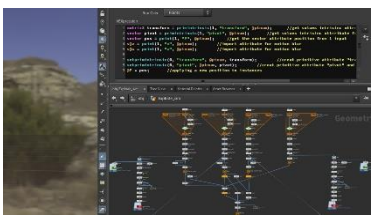
Link to video – Earrings

In this project, I tried to show a simplified animated casting process and some other stages of the production of earrings made of gold with green sapphires. I used FLIP simulation to animate the casting process. During the project, I gained interesting experience working with the animation of polygonal 3D models of jewelry, improved my skills working with lighting sources and learned some of the features of shooting jewelry.

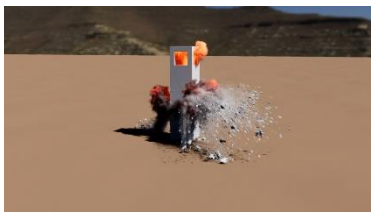
Tools: Houdini, Arnold

6. The scene of the explosion of the building

Link to video – Explosion in the building



The scene was created as a result of the practical use of knowledge about the methods and techniques of simulation smoke, fire, and explosions, as well as optimizing the settings of the Mantra render when simulating smoke, fire, and explosions.

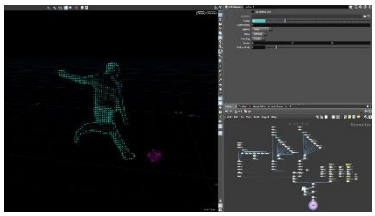


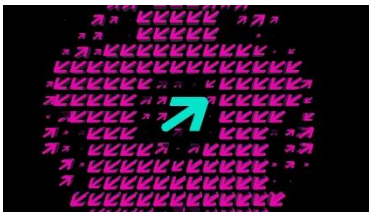
When creating the scene, an important condition was to implement a rapid change in the position of the source of the explosion, followed by a correct procedural recalculation of all participating nodes, including the trajectory of the bullet. This condition was met, and the position of the explosion source can be easily changed at any time, and all participating nodes do not require additional adjustments. At the same time, many parameters are available for detailed adjustment of the appearance of the scene, such as the speed and density of smoke emission from fragments flying away from the explosion, the range of randomness of the force and shape of the explosion, the shape and number of pieces of walls of the building, etc.

Rigid Body Solver, and SOP solver for operations with constraints were used in the simulation, and the transfer of the velocity vector from the volume to the geometry of the building was performed in VOP inside DOP. Pyro solver SOP and Pyrobakevolume, VEX code applying transformations to instances using intrinsic attributes and a matrix.

7. Youtube Intro

🔗 **Link to video – Youtube intro**

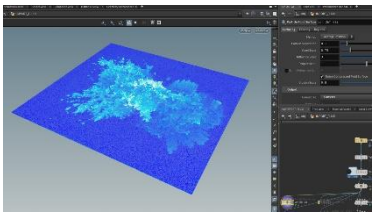




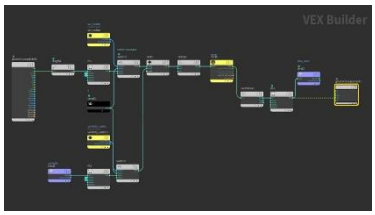
This is a series of short videos that I created for the Parimatch company. The script, materials, production, and post-production were entirely done by me. The concept was developed in accordance with the requirements of the company's brand book. When producing the video with the football player, I used real footage as a source, creating procedural settings for processing in the CHOP context. Then, I replicated the instanced geometry onto the generated points with some controlled randomness.
The preset I created for processing photos and video materials inspired me to embark on new experiments and develop another independent project based on them.
Tools: Houdini, Arnold, Fusion, Adobe Premiere Pro, Abobe After Effects

8. Working with particles(liquids).

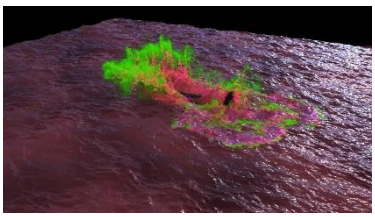
🔗 **Link to video – Houdini's whale bathes in particles**



This is not the result of the finish of the training course, it is the result of the use of knowledge about working with liquids obtained during self-education, for which a reference source similar to that used in one of the training courses was taken. I deliberately chose this reference image similar to the one used in some of the training courses, because I was able to find a lot of useful information on thematic forums when I had questions. I like working with particles, and I've done a lot of practical experiments to understand how it works in various scenarios.
This project uses Flip, Whitewater, and Static solvers, POP VOP, Geo VOP, POP Wrangler, VDB, correct transform particles to geometry, shaders, etc.
Tools: Houdini, Fusion, Mantra, Substance Painter.



I continue to improve my skill of working with particles in the project I am working on now.



During the project, the skill of creating various masks for liquids and saving values as render passes for subsequent compositing was improved.

Employment History

Freelance VFX Artist, Houdini Artist, FX TD, Bangkok
2021 – presents
Animation, simulation, toolmaking, lookdev, texturing, rendering, lighting, compositing, and modeling.

Lead electrical and electron engineer, founder of the full stock engineering company, Saint-Petersburg
2016 – 2022
Design, installation, and configuration of security alarms, access control, SCS, video surveillance, multimedia systems, Wi-Fi and computer networks, intercom, and radio transmitting equipment in company offices, commercial premises, art studios, and private houses. Selection of equipment for the project. Creation of commercial offers. Sale of equipment and services. Accompanying clients. Warranty and post-warranty support. Troubleshooting and service repair of equipment and components (including soldering BGA).