Petr Leontev

3D Engineer & Solutions Architect
(R&D, Realtime Content Streaming, Visualization Pipelines, 0-to-1)

Contacts

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Skills

***Focus on*:** Solution architecture, 3D Tools development, R&D, Prototyping, Machine Learning, 3D Visualization, Cloud Rendering, Realtime Content streaming, Data driven pipelines, Geometry&Texture processing, Algorithms, Data Structures, CPU/GPU framerate optimization

Tech: Unreal Engine 4/5, C++, Python, Node.js (Typescript), Multithreading techniques, AWS Infrastructure Development, VCS (Perforce, Git, Plastic), CI/CD (Jenkins CaSC, Teamcity), Windows/Linux, Docker, DirectX, fastai (Deep Learning)

Familiar: Python, C#, Rust, SQL & NoSQL Databases, Linux, DCC tools (Houdini/Maya/Blender), Nvidia Omniverse Extensions (Python), NeRFs pipeline&visualization, WebGPU

Work experience

Founder, 3D Engineer & Solutions Architect **Nov 2019 – Present**
at Unreal Solutions

I strive to create top-notch Streaming technologies, Visualization platforms, Cloud Rendering pipelines and 3D tools:

1) Mawari (Canada/Japan), 2023-Now: mawari.com (The platform to deliver high-fidelity 3D content to mobile & XR devices):
I led several R&D projects in 3D content streaming domain: NeRF analysis for realtime multi-view scene inference, enabling video streaming with transparency support, multi-view 3D streaming for mobile devices. These projects helped company executives to determine the company strategy for near future:
- Analyzed NeRF implementations as an alternative to multi-view 3D streaming to achieve ratio of 1 GPU to multiple viewers and presented results to C-level
- Extended Unreal Pixel Streaming pipeline to transmit Alpha channel to mobile (Android) and XR devices (WebRTC video codecs, NVENC)
- Prototyped 3D streaming demos (Unreal and Unity, WebGPU, realtime data transmission over network and rendering)
- Set up Jenkins pipeline to automated delivery & deployment of Unreal and Unity projects for external XR developers

2) Evovor (China), 2020-2023: evovor.com (Digital Humans presentation toolkit, “frontend for AI”)

I designed & developed Unreal plugins that constitute the core of EvoFashion software (MediaPipe integration and fine-tuning for pose landmark detection, cooking & packaging assets, runtime assets importers/exporters, client-server communication, runtime image loading and video recording).
(UE4/5, C++, API development, third-party software integration)

3) Conundrum AI (UK), 2021: conundrum.ai (Industrial AI for Metals & Mining)
I created Unreal framework from scratch to simulate high-quality visual defects on shaving razors. The framework is used to batch generate high-resolution input data (images) for a ML model to detect damaged razors.
(UE4, C++, vertex shaders)

4) HighArc (US), 2022-2023: higharc.com (The automated, all-in-one web platform for homebuilders)
I led Unreal Engine side of the development to create a photo-realistic visualization pipeline for home interiors. Results have been showcased at International Builders Show 2023 in Las Vegas.
Some of the cool things I delivered:
- AWS-based Job system for “fire & forget” Unreal rendering
- Path tracing 360 rendering
- Shadows, reflections, translucent reflections and data extraction from path traced Unreal scene for realtime web compositing
- Distributed video rendering on top of AWS EC2 (+Thinkbox Deadline)

5) Concurrents (US), 2020-2022: concurrents.com (Unreal-based cloud streaming technology for game content, GPEG)
I led efforts to:
- improve realtime asset streaming (textures / geometry / sounds / animations / skeletal meshes)
- introduce CPU/GPU optimizations (DirectX) to achieve stable frame rates
- optimize networking via multihreading approaches (win&linux sockets)
- implement timeslicing techniques to avoid GPU stalls and hitches
- enable level streaming optimizations
- investigate how to extend built-in virtual texturing system to stream texture data from the server
- design “preview streaming” tool to ease debugging process in high volume content context
- add VCS automation to the pipeline (Teamcity)
(UE4, C++)

6) Spherical Studio (US), 2021-2022, spherical.studio (3D framework for watershed visualization in Los Angeles)
I set up Pixel Streaming pipeline and did multiple improvements there (Google Cloud specific), established asset delivery pipeline, investigated multiview rendering in Cesium context and did profiling and optimizations to achieve stable frame rates.

7) Sber AR/VR Lab (Russia), 2021: unrealengine.com/marketplace/en-US/product/digital-avatar-service-link (Face Animation SDK for MetaHumans)
I developed Unreal SDK to create realistic face animations from audio files at runtime using AI

backend.
(UE4, C++, API development)

Senior Unreal Engine Programmer (3D Tools) **Oct 2018 – Nov 2019**
at 1C Entertainment (Fulqrum Publishing)

King's Bounty 2. Contributions (Unreal Engine 4, C++, Python):
1) 3D Tools development: road editor (texture atlases support, World Composition integration, no Houdini required), realtime blending system for dynamic lighting, FMOD preview support, landscape utilities in open world context
2) Engine modifications: landscape tools customization, blueprint snapping support (to speed up level design workflow), occlusion culling R&D
3) Codebase adaptation to YWYU ideology to improve development workflow and decrease compilation time (by 2-2.5x)
4) Frame rate optimization using built-in CPU/GPU profiling tools to fix Garbage Collection hitches, Async Loading time and Level Streaming bottlenecks
5) Build pipeline and CI support, batch processing of game content
6) Mentoring new members of the team to increase efficiency of onboarding process

Technical lead **Feb 2017 – Sep 2018**
at Screwdriver Entertainment (indie studio)

POSTWORLD is Hardcore Action RPG with non-linear story and possibility to replace character body parts on the fly (Steam, 2018). What I did (Unreal Engine 4, C++ & Blueprints):
1) Architecture development of gameplay systems (modular characters, modular weapons, inventory, etc.) and game flow
2) R&D of procedural terrain generation and procedural object placement to speed up level design
3) Editor extensions and plugins to speed up the level design workflow

Backend Python Developer **Dec 2015 – Jan 2017**
at Panoramik Inc.

My job responsibilities were:
1) Maintenance and support of mobile games backend: Forge of Gods and Mighty Party (Flask, Python, GAE, NoSQL + SQL Databases)
2) General improvements of the backend logic in terms of performance and scalability, with respect to time complexity, sync/async trade-off (memcache, taskqueues, cron)
3) Experimental migration from AppEngine to Appscale (independent AWS Hybrid Cloud) to significantly reduce the server costs.

Education

BSc, Applied Mathematics, Tomsk Polytechnic University (2010 – 2014)
Professional development, Bioinformatics and Machine Learning (2015-1016)
Professional development, Practical Deep Learning (2023-2024)

Languages: English, Russian, Chinese (basic)