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, Plugins, SDKs, Third-party integrations, R&D, Prototyping, 3D visualization platforms, Cloud rendering, Realtime content streaming, Data driven pipelines, Geometry & texture processing, Algorithms, Data Structures, CPU/GPU framerate optimization, Multithreading techniques

Tech: Unreal Engine 4/5, C/C++, Python, Node.js (Typescript, React), AWS EC2, DirectX 11/12, VCS (Perforce, Git, Plastic), CI/CD (Jenkins CaSC, Teamcity), Windows/Linux, Docker

Familiar: WebGPU, C#, Java, Nvidia Omniverse (Python), SQL & NoSQL Databases, DCC tools (Houdini/Maya/Blender), fastai (Deep Learning)

Work experience

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

1) Mawari (Canada/Japan), 2023-2024: mawari.com (Realtime streaming of high fidelity 3D content in XR):
I contributed to several R&D projects in 3D domain that aim to stream high-fidelity 3D content to low-power devices:
- Played a pivotal role in shaping company strategy by contributing to transparent video streaming and multiview 3D capabilities for mobile devices, influencing C-level decision-making.
- Architected and implemented an extension enabling Alpha channel transmission to mobile (Android) and XR devices, leveraging WebRTC video codecs and NVENC (Unreal Engine Pixel Streaming)
- Successfully prototyped demos for Unreal and Unity, showcasing real-time 3D data transmission over networks for realtime rendering
- Established and managed Jenkins pipelines for Unreal and Unity projects, automating delivery and deployment processes for external XR developers to reduce burden on the core team

2) HighArc (US), 2022-2023: higharc.com (Homebuilding cloud powered by a unified data-driven model)
I led the development of a cutting-edge, cloud-ready, data-driven visualization pipeline for home interiors using Unreal Engine. The tech demo is accessible via web browsers and was showcased

at the International Builders Show 2023 in Las Vegas. Here are some of the results I achieved:
- AWS-based Job system for “fire & forget” Unreal rendering
- Path tracing 360 rendering (Unreal Engine, Shaders)
- Shadows, reflections, translucent reflections and data extraction from path traced Unreal scene for realtime web compositing (Python image processing libs)
- Realtime image compositing in the web browsers (Typescript)
- Distributed video rendering on top of AWS EC2 (Thinkbox Deadline)

3) Conundrum AI (UK), 2021: conundrum.ai (Digital Twins, Industrial AI)
I created Digital Twins framework on top of Unreal Engine to simulate high-fidelity 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) 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 (cooking & packaging of modular content, runtime assets importers/exporters, client-server communication, runtime image loading and video recording, data-driven dynamic animation blending system).
(UE4/5, C++, API development, third-party software integration)

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
- 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 – 2016)
Professional development, Practical Deep Learning (2023 – 2024)

Languages: English, Russian, Chinese (basic)