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, Team velocity, 3D Tools development, R&D, Prototyping, 3D Visualization, Cloud Rendering, Content streaming, Pipelines, Geometry&Texture processing, Algorithms, Data Structures, CPU/GPU framerate optimization

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

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

Work experience

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

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

1) 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++)

2) 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
- Fully automated 360 captures
- Path tracing 360 rendering
- Shadows, reflections, translucent reflections and data extraction from path traced Unreal scene for web compositing
- Distributed video rendering on top of AWS EC2 (+Thinkbox Deadline)

3) 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.

4) Evovor (Canada/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 assets, runtime assets importers/exporters, client-server communication, runtime image loading).
(UE4/5, C++, API development, third-party software integration)

5) 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.
(UE4, C++, API development)

6) 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.
(UE4, C++, vertex shaders)

7) Unreal tech development (Worldwide):
unrealengine.com/marketplace/en-US/profile/Unreal+Solutions+Ltd
Plugins for Unreal Engine that add often missing Runtime features (i.e. video encoding)

Senior Unreal Engine Programmer (3D Tools)   **Oct 2018 – Nov 2019**
at 1C Entertainment (acquired by Tencent)

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) UMG UI logic (in-game interfaces)
4) Editor extensions and plugins to speed up 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 (open-source implementation of
AppEngine) to significantly reduce the server costs (based on container-based virtualization
techs)

Education

BSc, Applied Mathematics, Tomsk Polytechnic University (2010 – 2014)
Professional development, Algorithmic Bioinformatics, Saint-Petersburg Bioinformatics Institute
(2014 – 2015)

Languages: English, Russian, Chinese (basic)