David Joffe BSc Computer Science

Principal Software Engineer

(C++ / CUDA / GPU / Cross-Platform / Python / AI)

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DJoffe.com davidjoffe.github.io
Co-founder: TshwaneDJe.com

TECHNICAL SKILLS

Programming Languages

C/C++, **Python**, **PHP**, **Lua**, JavaScript (JS), C#, Pascal

GPU Programming, CUDA (NVIDIA), nvcc, PTX, SASS, **s**m_89, kernel programming, particle systems, molecular simulation (Lennard Jones), GPU computing, shaders

SDK Development; engine development

Simulators: Training Simulators; Flight simulators; Missile simulators; High-Voltage Yard/Line Simulators; Mining Simulators

Networking & IPC: TCP/IP, sockets; UDP, **Network programming**, PocoNet, REST APIs, RESTful, COM

Backend & Cloud: API development, microservices, nginx, Apache, AWS, distributed systems; Node.js, .NET, Docker, Kubernetes (K8s), minikube, Kustomize, Azure, aws-cli, GCP

Cross-Platform Development: Windows, **Linux**, **macOS**, WSL/WSL2. SDL; wxWidgets, CMake; Unix Mobile: adb (Android debug tool)

3D & Graphics: Unreal Engine, OpenGL, DirectX, SDL. Virtual Reality (VR); 3ds Max, glfw, imgui

Databases: SQL, PostgreSQL, MySQL, phpMyAdmin, ODBC

AI: LLM integration; OpenAI integration, ollama and LM studio integration, Generative AI

Version Control & Tooling: **git**, GitHub, Visual Studio, VS Code,

SUMMARY: 30 years' experience building production C++ systems: GPU-accelerated simulation, complex, networked, cross-platform applications and engines (integrated web/API servers, real-time 3D/VR graphics simulators, **GPU & CUDA programming**, multi-user editing & publishing, **AI/LLM integration**, **API development**, localization.) Game development. Docker, Kubernetes, cloud. **Co-founder** of TshwaneDJe Software. Open to remote opportunities internationally with tech companies like Amazon, Microsoft, NVIDIA, AMD, Intel and Apple.

PRIMARY SKILLS/EXPERIENCE

C/C++, **Python**, **PHP**, Lua, JavaScript, C#, HTML/CSS. **CUDA; GPU programming**. 3D Graphics (DirectX, OpenGL, Unreal Engine); Virtual Reality. Cross-platform application development. **Networking** (TCP/IP sockets; **API development**; server development). **AI** integration. **Localization.** Web development. **SDK/engine development**. Software training; published research. *Hard-working; can adapt quickly to new languages, technologies & projects.*

Professional Experience

(2025) Built a **CUDA-accelerated molecular simulation** (Lennard-Jones + Verlet), scaling to ~100k particles on laptop GPUs, with cross-platform support, headless batch execution, container-based deployment with Docker/Kubernetes; designed as foundations for future computational biology and longevity-related work. **Source: github.com/davidjoffe/dj-cuda-samples**

Creator of **runai**, a command-line-integrated AI automation tool for real-world engineering & research workflows. **Source: github.com/djsoftware1/runai**

ACADEMIC IMPACT: *Co-author of peer-reviewed research on electronic dictionaries, lexicography tooling, and user behavior (≈390 Google Scholar citations; h-index 8). Research directly informed the design and adoption of TLex and related systems* ***https://scholar.google.com/citations?user=th4zRdgAAAAJ***

PRINCIPAL SOFTWARE ENGINEER & CO-FOUNDER

TshwaneDJe Software *(Apr 2004 – Present)*

IMPACT: Software foundations of dictionary production in South Africa (and internationally), including whole new range of bilingual education dictionaries co-developed in partnership with Oxford University Press, in use by & help millions of learners daily

- **Principal Software Engineer**: Created **TLex Suite** (mainly C++), lexicography software applications in use by publishers like Oxford University Press. Consists of multiple **cross-platform applications** (TLex lexicography software, tlTerm terminology software, concordance software); multi-user XML editing, relational database support, integrated **Web/API server**, scalability, many import/export formats (csv, tbx, tmx, xliff, html, rtf, xslt). >400,000 lines of code. Multi-threaded. I used libcurl to implement **AI integration** (OpenAI API, ollama, LM studio). **Integrated Lua scripting**. IPC (Inter-Process Communication). PHP-based Web Publishing platform. **Word/Excel integration**. (Used by Pearson, Malaysian Institute of Languages & Literature, more.) *Sample code on request: C++, PHP, Lua, …*
- Designed & implemented built-in **tri-function integrated server** (web server, API server, & IPC server for inter-application communication, e.g. TLex/tlCorpus "linked mode") using PocoNet
- **Developed many websites** for clients, including dictionary & terminology platforms
  IMPACT: Online dictionaries help education & economic upliftment for many users, such as africanlanguages.com/swahili/

SENIOR DEVELOPER

5DT (Fifth Dimension Technologies) *(Dec 1995 – Apr 2004)*

gcc/clang, subversion

Other: Localization (tbx, tmx, xliff, po; gettext); **Web development**; **HTML/CSS**, high-performance computing, x86 assembly 16-bit, **Adobe Photoshop**, COM automation (Word/Excel automation), Lua integration, libcurl , XML, JSON, VirtualBox.

In progress work: Metal (Apple)

Game development
Application development
Software Training, Project management
Full online resume
Languages: English (1st language), **Afrikaans**, basic Hebrew

Updated 31 Dec 2025

VR (Virtual Reality) (DirectX, OpenGL, TCP/IP networking, sockets, etc.)
IMPACT: Mining Training Simulators I developed are used by miners in South Africa and internationally, helping broadly improve productivity of mining which underpins much economic activity and development.
IMPACT: Flight Simulator Visualization System helps underpin training of air force pilots.

- C++ Developed 3D VR (Virtual Reality) **flight simulator** systems (integrated at flight training center in Langebaan for SA air force)
- C++ Developed 3D Virtual Reality mining training simulators; high-voltage training simulators. 5dt.com/mining-simulators/
  Including client/server networking, motion platform integration, UDP three-screen projector synchronization, recording/playback, training features
- C++ Co-developer of 3D VR driving training simulator
- C++ (Lead Developer) Managed development of 5DT SDK (Software Development Kit) (3D graphics OpenGL/D3D, sound, networking & framework). Lead developer of networking library.
- C++ 3D Unmanned Aerial Vehicle (UAV) simulator (for Kentron)
- C++ (**Lead Software Engineer**) Created 3D Virtual Reality guided missile training simulator ("VR Polyphem" for EADS Europe) with virtual environment (using real-world terrain & satellite data), virtual missile & controls, infrared, networking

Key Projects

- **Dave Gnukem** (**Open Source**) Led development of cross-platform Retro 2D Game that is now included **in official Debian** Linux. GitHub source repo (C++)

- **runai — AI Task Automation CLI (Creator & Lead Engineer)**
  Python, LLMs, CLI tooling, cross-platform
  • Designed and implemented a command-line Make-like, AI automation tool that integrates directly into developer workflows (terminal / VS Code).
  • Enables context-aware, repeatable AI tasks such as code generation, refactoring, batch content creation, and research automation.
  • Supports multiple LLM backends (local and cloud), optional multi-agent workflows, and automatic code block extraction into files.
  • **Cross-platform** (Windows, macOS, Linux); executable from PATH in any folder. Modular **backends**, safety controls, extensible task definitions.
  • Used for real-world tasks including scientific prototyping, codebase refactoring, and large-scale content generation.
  Source-available under *Business Source License*; personal, research, and evaluation use supported. – GitHub source repo

- **Custom 3D Engine & SDK (C++)** Co-developed a production-oriented 3D game and simulator engine and SDK ("ddSDK") designed as a reusable platform with modular subsystems for **rendering**, **networking**, audio, entities, asset loading, and game logic. Implemented core engine architecture and real-time client/server multiplayer networking; collaborated on an OpenGL-based renderer inspired by Quake III–era engine design. The codebase was professionally maintained and preserved across SourceSafe, Subversion, and Git migrations and remains executable on modern Windows systems. *Source available on request.*

- **EC Department of Education (2024)**: Led development of multilingual terminology server, software for editing & publishing the terminology, & built Apps/website for learners to access the terminology. Also **presented the software training**.
  IMPACT: Help education and multilingual access to education resources for millions of learners

Education

BSc Computer Science- University of Pretoria - 1998