Mark H Carolan – Software Designer and Developer

PROFILE SUMMARY

+ Senior programmer, C# (also C++, ANSI C, Lua)
+ 10+ years Unity 3D
+ Successfully delivered multiple highly interactive 2D and 3D products for:

- Education/simulation
- Entertainment/games
- Product promotion
- Work safety and training

CONTACT INFO

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Extensive experience leading technical development, managing teams, mentoring, and establishing production workflow standards to deliver complex, high-profile interactive XR and media projects on time and within budget. I started professional XR development in 2014 and have been doing it exclusively (mostly on the Oculus/Meta platform) since 2016.

KEY SKILLS SUMMARY

- Multi-platform software development (Windows, OS X, Android, iOS, Oculus).
- Proficient in C#, C++, ANSI C and Lua. Some experience in Assembly, Pascal, Smalltalk, Lingo, Python, Erlang, JavaScript/TypeScript, and various niche and DS languages.
- Extensive experience with real-time 2D and 3D graphics, audio effects and spatial audio solution development.
- Advanced knowledge of Unity 3D game and simulation development for desktop, mobile and VR applications, including extending Unity with custom tools.
- Broad experience in developing reusable software frameworks and development tools.
- DevOps with custom automated build and testing pipelines.
- Cloud development with AWS (S3, DB etc.) and some Azure.
- Experience in high performance network communications using TCP & UDP Sockets, REST etc.
- Game development and gamification of educational material for mobile (iOS, Android), VR (Oculus PC and mobile, Win MR), web and desktop (Win, Mac) delivery.
- Documentation and technical writing, mentoring of junior developers, assisting as a communication bridge between tech and business.
- Project management and coordination using SCM tech and tools including native Git, Subversion, Jira, Pivotal Tracker, GitHub and Bitbucket.
- Many years of experience working with remote, onsite, local, and international teams as technical team leader, senior developer, solo developer, or dev manager on time-sensitive projects.

RECENT EXAMPLE ACHIEVEMENTS

- Porting VR apps to Apple Vision Pro.
- Working on commercial VR game (Quest version released March 2024).
- Designed and built Meta-funded Quest prototypes using new AR tech.
- Designed and built runtime tech for ArchViz products.

- Designed and developed the successful *VApprentice* for Busy At Work which used virtual reality on Oculus Go to enable teenagers to experience work tasks in trades prior to choosing career paths.
- Designed and developed VRLearn client and Play VR for Panedia – VR safety training products using 360˚ video including user experience (UI, navigation, interactions) and integration with back-end LMS.
- Team lead: development of interactive Oculus Rift VR product launch experience for Chevrolet and Dassault 3D Experience used at the Detroit Motor show.
- Lead developer on STEM learning tools for zSpace holographic educational platform. See: https://www.4dpipeline.com.

WORK HISTORY

Toast Interactive: Gold Coast QLD November 2022 – November 2024
Role: Senior developer
Responsible for:
- Designed and developed prototype VR/AR prototypes showcasing new Meta passthrough tech.
- Integrating new AR tech into the company's flagship VR product.
- Converting existing IP (Quest, PSVR & PCVR) to Apple Vision Pro (visionOS).
- Assisting in adding new functionality and completing new VR game.
- Overseeing development and build pipeline for Gamescom pre-release version.

Real Serious Games: Brisbane QLD July 2022 – November 2022
Role: Lead Developer
Responsible for:
- Overseeing updating of existing software infrastructure
- Creating a cloud licensing system for their XR training software

RCAD: Brisbane QLD February 2021 – June 2022
Role: Lead Unity developer. Product: RCAD
Responsible for:
- General R&D into tech directions, recommendations on design & develop strategies.
- Analysing and documenting legacy code.
- Developing middleware for multiplayer functionality, connection to AWS, analysis and reporting tools (heatmaps etc.).
- WebGL versions of real-time 3D applications (BabylonJS).
- Win64 tools for managing AWS database queries and reporting.
- XR navigation functionality and live mode switching (XR, desktop).
- Desktop tools for model decimation (using Simplygon SDK).
- In-app tools for generating complete web-ready linked 360 panorama packages taken from architectural walk-throughs (for use in commercial real estate listings).
- Recording tools for generating cinematic replays of walk-throughs and player analysis.

2020:
Worked on some side projects while spending most of the year sorting out complex family business issues (as Estate executor, director of various inter-connected companies and director of Trustee company).

BUSY At Work: Southport QLD   October 2018 - end September 2019
 Role: Lead Unity C# VR developer. Product: VApprentice
Responsible for:
- Application design and development of a series of VR educational games with supporting game framework - for Oculus Go delivery.
- Creating basic artwork and animations with Blender.
- Managing contract 3D artists and animators.
- Managing art pipeline and custom components for biped animations and facial expressions.
- Design and build extensible framework for multi-themed VR games.

Example press info.

VRLearn/Panedia: Southport QLD January 2016 – August 2018
 Role: Lead Unity C# VR developer. Products: VRLearn, PlayVR
Responsible for:
- Development of VRLearn client applications and user experience (UI, navigation, interaction models). Product suite included VR app for Gear VR and Oculus Go (also available on Rift and Windows MR) and a companion mobile Android app for logging in, course management (supervisor, teacher and pupil modes), live statistics and remote control and synchronization for group training.
- Using VRLearn to create VR safety training products for clients including Qantas, BodyCare and Gold Coast University Hospital, including integration with back-end Learning Management System for scoring, logging and VR user interaction statistics.

4D Pipeline (Remote - USA, Germany, Singapore): February 2013 - January 2016
 Role: Senior lead developer C#, C++. Products: Multiple - see 4D Pipeline
Responsible for:
- Custom application development for interactive 3D, real-time ray-tracing software and VR experiences at a specialist 3D agency contracting to industry ISVs and design and marketing agencies on multiple projects, as either team lead or solo developer. Clients included: Chevrolet, Dassault Systèmes (Solidworks Visualize), zSpace, Unity Technologies, Nemetschek (ArchiCAD).
- Prototype configurator Unity editor extension (later released as Unity Forma).
- Interactive raytracer for ArchiCAD (using NVIDIA iRay).
- VR car simulator for Chevrolet (Detroit Motor Show 2015).
- zSpace educational STEM activities for US market.

Other Roles
- **Knight Frank Price Waterhouse/Dept of Finance and Administration, Canberra: March 2000 – January 2002:** Developer of 3D UI, IPC (Java, JD Edwards), Oracle DB.
- **Earlier**: Worked as a developer for various startups including: web ISP control bar for Amicus (Mac, Windows, C++), in-house game development tool for Brilliant Digital Entertainment (C++, MFC, SQL), voice announcement system used by NSW State Rail for Open Access (ANSI C, UDP Sockets, Win NT), multimedia educational development system for Big Animated Digital (Director, C, Mac). Contractor for various repeat clients such as Australian Film, Television and Radio School (AFTRS), developing niche visualization and video editing tools.

- **Prior to software development**: Ran a consumer audio importing, distribution and servicing business and was owner/operator of a digital audio post-production studio (based on the Fairlight MFX) in the Sydney CBD. Repeat clients included SBS Television (Australia).

Publications
- **Dr Dobbs Journal**: Cross-platform video development (C, Quicktime, Mac/Windows)
- **Dr Dobbs Journal**: Cross-platform 3D graphics development (C++, Apple RAVE 3D, Mac/Windows)
- **Dr Dobbs Journal**: Netscape plug-in development (C++, Mac/Windows)