Stephen Buchanan: Curriculum Vitae

Essential Information

AGE: 42 (born 4 August 1981)
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Key Skills

Technology specialisations	Programming languages	Other skills
Full stack web development interactive installations, computer vision, graphics, lighting control, microcontrollers, game development, distributed architecture, digital audio, digital video	*Current:* Rust, TypeScript, C++, GLSL, WGSL, Python. *Previously:* Java, PHP	Linux, Docker, 3D modelling and 3D printing, UX design, TouchDesigner, Video editing, Technical writing, CI/CD, Git, Agile project management

Employment History

Senior Creative Technologist, Random Studio
02/2017 - Present (Amsterdam, NL)

Client Portfolio: Successfully delivered high-tech projects for renowned clients in the fashion/retail sector, including Nike, Chanel, Boucheron, Vans, and FarFetch.

Project Scope: Specialised in developing interactive installations with operational lifetimes ranging from single-day events to long-term installations spanning weeks or years. Most projects incorporated web technologies at various levels, while others were specifically web-focussed, e.g. microsites and website prototypes. My role encompassed programming, technical consulting, directing teams of developers and/or working alone on developing software/hardware solutions.

Demonstrated Technical Expertise:

- **Frontend Development:** Proficient in React (with TypeScript) and Svelte. WebGL libraries such as ThreeJS, BabylonJS, PixiJS and Cables.GL.
- **Graphics:** C++ for high-performance graphics, especially openFrameworks, but recently also Rust (with WGPU). I am very comfortable with GLSL shader programming, and learning WGSL fast. I use visual programming environments such as Cables.GL and TouchDesigner when appropriate.
- **VR/AR:** I have built WebVR projects using A-frame, and also custom Instagram face filters using Meta's Spark Studio.
- **Video:** I use ffmpeg extensively in my daily work, and my past experience as a video editor and motion graphics designer means I am very at ease with video media tech, whether it is streaming, capturing, transcoding or generating video.
- **Backend Development:** Skilled in NodeJS (especially for REST APIs, but also websocket-based systems) and Rust for backend infrastructure, with experience in Python for scripting and machine learning workflows. I am also experienced with SvelteKit and NextJS. I am comfortable with both SQL (e.g. PostgreSQL) and NoSQL databases, ORM systems and GraphQL. I am comfortable with "bare metal" servers as well as cloud services, especially AWS and Netlify.

- **Machine Learning:** I have trained custom models using PyTorch, including Yolov6 models for computer vision tasks.
- **Infrastructure & Deployment:** Extensive experience in deploying on Ubuntu Linux, Raspberry Pi, and Docker-based environments, employing microservices architecture and MQTT for communication.
- **Monitoring & Management:** Utilised tools such as Datadog for system performance monitoring and managed installations both on-site and remotely using SSH, reverse proxying, and TeamViewer/Parsec.
- **Audio & Music:** Proficient in WebAudio API (for my own custom libraries), but also HowlerJS and ToneJS, and as well as audio editing utilities for generative music and sound design.
- **Open Source Contribution:** Contributed significantly to the development of Tether, a suite of libraries and tools aimed at improving the developer experience for interactive installation projects. I also frequently publish my own utilities and small libraries for both Rust (crates.io) and TypeScript (npm).

Hardware Proficiency: Experienced with a wide range of sensors including LIDAR and camera-based systems (thermal, infrared, etc.), controllable LED lighting, projectors, and digital signage systems. I have developed plenty of software for Arduino and ESP32 microcontrollers.

Methodologies: Adhered to Agile methodologies with a focus on test-driven development, leveraging tools like Jest for TypeScript/Javascript projects. Proficient in both Object-oriented and functional programming paradigms.

Design Skills: I have excellent PhotoShop and Figma skills, and a good eye for layout and aesthetics.**I** also design custom enclosures and mounting solutions using CAD tools such as Rhino for 3D printing. I have a lot of experience with UX design for screens as well as immersive experiences.

Head: Interactive Design, Mann Made Media
08/2012 -12/2016 (Johannesburg, SA)

Team Leadership and Project Management: Led a dynamic team of developers and coordinated multidisciplinary efforts involving designers, illustrators, 3D animators, and electrical engineers to deliver innovative products and experiences leveraging technology.

Project Scope: Directed the development of custom interactive installations for events, exhibitions, and retail, alongside mobile apps, games, and online campaigns, catering to clients across financial services, FMCG, and automotive industries.

Key Project Highlight: Spearheaded the creation of a groundbreaking "Virtual Car Dealership" digital showroom installation, integrating an interactive table display utilising computer vision, a Kinect sensor, an iPad app, WebGL graphics, and seamless integration with the client's backend CRM system.

Technical Expertise:

- **Frontend Development:** Utilised AngularJS for frontend development alongside openFrameworks (C++) and D3.js for data visualisation.
- **Game Development:** Employed Unity for game development, with additional support for BlackBerry through a pure-Java version of a game.
- **Backend Infrastructure:** Leveraged NodeJS extensively, embraced serverless infrastructure using Heroku (now part of Salesforce), and containerization for backend infrastructure, often integrating MongoDB and WebSockets for real-time data requirements.
- **Cloud Services:** Managed large-scale media handling, particularly video, utilising AWS S3 cloud storage. Also used Heroku (now Salesforce) cloud application platform for multiple projects.

Manager: Strategic Support Services, Scatterlings Conference & Events
10/2011 - 03/2012 (Johannesburg, SA)

A wide range of responsibilities, including creative conceptualisation and graphic/digital design for various events, and lead web developer managing a team of two other developers. This involved mostly PHP, MySQL and Javascript programming. Clients were primarily in the pharmaceutical and life sciences industries.

Video Editing, Motion Graphics, Interactive Media: Mann Made Media
07/2006 – 09/2011 (Johannesburg, SA)

Editing videos, mostly corporate, but also documentaries, commercials, live-captured events, etc. Also responsible for high-level IT and workflow management strategy within our post production facility (fibre-optic Storage Area Network and tape backup systems). Designing and producing motion graphics using After Effects and Apple Motion.

In this period I developed the role of Interaction Designer/Developer, creating a distinct line of business within the company designing and developing custom-built interactive digital installations for events. A lot of this early work was created in Java using the Processing framework.

Freelance Video Editor
04/2006 – 07/2006 (Johannesburg, SA)

Editing videos for clients ranging from commercials to corporate media production companies.

Online Editor, Pandamonium Productions
12/2005 – 03/2006 (Johannesburg, SA)

I was the sole offline/online editor for the entire first series of "The Most Amazing Show", a comedy show combining studio elements with short montages and comedy sketches. This was a high-pressure environment with weekly national broadcasts.

Freelance Media Production, Web Development
01/2005 – 12/2005 (Grahamstown, SA)

I operated as a one-man production company making videos for Rhodes University, NGO's and small businesses, as well as some inserts for broadcast in collaboration with others. For the Department of International Studies (Rhodes University), I developed and maintained a custom-built CMS using PHP and MySQL.

In the Television Journalism Department, I was a Lecturing Assistant, developing and designing course material (mostly camerawork and post-production training). I also spent a lot of time doing technical support for the Department's editing facilities.

Formal Education

University: Rhodes University, 2001-2004: Bachelor of Journalism (B.Journ) specialising in Television; a 4 year degree. I also majored in English Literature and completed 2 years of Computer Science. I also took Economics, Mathematics and Sociology. I excelled in all subjects and graduated *cum laude*.

Other qualifications: Certificate in Management Practice (Rhodes University). Certified Avid Editor. For my own interest, I also completed a Philosophy course at Nelson Mandela Metropolitan University. I have a certification for "Green Software for Practitioners" from the Linux Foundation.

Other Interests

Sustainability, music composition & production, road cycling, woodwork