Diogo Ramos Constâncio

Curriculum Vitæ

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About

I am a Researcher and Software Developer from Braga, Portugal, specializing in developing Mixed Reality experiences using AR, VR, and Microsoft's Hololens. Academically, I'm a Master's student at the University of Minho, having completed the specialisations in Computer Graphics as well as Parallel and Distributed Computing, with my thesis on Virtual Reality currently on hold. Professionally, I've been a researcher at two companies, where I've focused on developing multiple Mixed Reality experiences, with various topics covering entertainment, education, and training. I pivoted to the security sector and now my work is focused on detecting exploitable vulnerabilities in source code as a part of a team specifically focused on improving product accuracy and coverage.

Education

2016–Present **Master's Degree in Informatics Engineering (On hold)**, *University of Minho*, Braga, Portugal.
Specialization in: Computer Graphics and Parallel & Distributed Computing

2013–2016 **Bachelor's Degree in Informatics Engineering**, *University of Minho*, Braga, Portugal.

2013 **Proficiency in English**, *Cambridge University*, Cambridge, United Kingdom.

Master Dissertation

title *Virtual Reality Animation Studio* (On hold)

supervisors António Ramires Fernandes

description This dissertation describes the development of a 3D animation software in a virtual reality environment, with a particular focus on HMI.

Experience

Vocational

Feb 2022 - Present **AppSec R&D Developer**, *Checkmarx*, Braga, Portugal

○ Integrated with QA, AppSec, and CS teams to implement new features, modernise the engine to keep up with the latest reseach and vulnerabilities, and integrate customer feedback.
○ Participated in multiple product quality initiatives by conducting vulnerability analysis on multiple real-world projects, and afterwards implementing the findings to improve the product's accuracy.

Aug 2020 - Aug 2021 **Researcher**, *DTx - Digital Transformation CoLab*, Guimarães, Portugal

○ Co-designed and developed the EdAR engine, an Augmented Reality engine in Unity to enable a streamlined content creation pipeline for educational AR experiences.
○ Backend development on AWS.

- Developed Mixed Reality demos on the Hololens 2.
- Developed an application for industrial quality control, based on C++ and OpenGL.
- Lead the development of a VR application for a building tour in Unreal Engine 4.
- Presented multiple projects in client visits, conferences, and media initiatives.

Mar 2019 - August 2020 — **Senior Development Technician**, *Centro de Computação Gráfica*, Guimarães, Portugal
- Lead the development of the Augmented/Virtual/Mixed Reality components of several projects, both European projects and more typical client-focused projects, with two main examples being the UH4SP and Product in Touch projects detailed below.
- Responsible for Mixed Reality development using Microsoft's Hololens through most of the length of the role.
- Backend development.
- Server administration for our department, Docker orchestration.
- Coaching and informal training of new colleagues in the AR/VR/MR areas.
- Responsible for representing the department in multiple client visits, sales meetings and conferences.
- Regularly assisted with project planning, budgeting, and client relations in AR/VR/MR projects.

Mar 2018 - Mar 2019 — **Development Technician**, *Centro de Computação Gráfica*, Guimarães, Portugal

- Development of Augmented Reality and Mixed Reality projects, both European and client-focused.
- Backend development.
- Responsible for representing the department in multiple client visits, sales meetings and conferences.

Aug 2016 - Mar 2017 — **Research Grant**, *HASLab, INESC Tec* , Braga, Portugal

- Development of the multi-platform Safecloud desktop client with Java and JavaFX.
- Focus on security and extendable code, together with a simple and intuitive UX.

Miscellaneous

Jun 2013 - Set 2013 — **Factory Assistant**, *Vincarte LDA*, Vieira de Leiria, Portugal.

Jun 2014 - Jul 2014 — **Software Developer**, *Vincarte LDA*, Vieira de Leiria, Portugal.
- Modernised the factory floor management system, that was mostly paper-based into an electronic system based on Java and MySQL.

Jul 2014 - Set 2014 — **Factory Assistant**, *Vincarte LDA*, Vieira de Leiria, Portugal.

Major Projects

- **EdAR** ↗ - The EdAR project consists of an extensible, Unity-based, framework for the development of custom AR experiences for education for phones and tablets. The project was created with the goal of making AR content creation accessible to academic staff, providing an easy way for teachers to augment their teaching with multimedia content in AR. In partnership with the University of Edinburgh, I co-developed the engine that powered the experiences, implemented several, and was the developer responsible for the networking implementation, which enabled the application to stream content from AWS, keeping content updated with the least amount of possible friction for creators.
- **UH4SP** ↗ - Unified Hub 4 Smart Plants - Total Budget: 0.9M€(COMPETE2020)

Development of a software service-oriented architecture and technology solutions, under the paradigm of IoT and Industry 4.0, which promotes a corporate and aggregate vision of industrial units operations dispersed across different geographies through remote and local access; building collaborative and cross-cutting tools; optimisation of operations and user experience in industrial units and, finally, system reliability. My main task focused on the development of a full-stack solution for Remote Assistance using Microsoft's Hololens on one end, and web technologies such as Angular and Node.JS on the other, featuring real-time audio/video communications, bidirectional annotations in the physical environment, and user-defined multimedia content.

○ **Product In Touch** ◪ - Development and Industrial Validation of a Multimodal Virtual Prototyping for In-Car Design - Total Budget: 1.3M€(PT2020) - This project aims for the exploration of the tactile sensation in the design of specific components integrated into cars interiors, by developing a tactile probe that extracts features from real manufactured parts, coupled with a computational model to correlate the gathered data with the features in the part. To complement this, a virtual prototyping and visualisation system is to be integrated into the QC process, to provide visual and tactile feedback before the mould is produced. My contribution to this project, which was still in its early stages, was in the development of this latter virtual system, using an HTC Vive and VR gloves to allow the user to be immersed and interact with the pre-manufacture prototype.

○ **ESE2020** ◪ - Enhancing Shopping Experience - This is a two-sided project, with one side focused on providing retailers with a toolset to better engage costumers, by offering a set of interactive, immerse, and innovating experiences, both within the shop and without. Where consumers are concerned, this project aims to bridge the *online* and *offline* retail channels into a more unified experience, allowing users a more seamless and informed purchasing process. My role in this project was the design of the architecture and development of an extensible AR application, consuming custom scene descriptors from a remote CRM, to present a dynamic and engaging experience, with a particular focus on the presentation of, and interaction with, custom multimedia content.

○ **Bosch P19** ◪ - Bosch CMMS - The CMMS (Computerized Maintenance Management System) project aims to develop an innovative new system for management of scheduled maintenance interventions. The proposed system resulted in an upgrade of the existing system through a new architecture and a set of advanced management methodologies and functionalities. In particular, my role was to implement a new mixed reality application using Microsoft's Hololens, capable of presenting, both in real-time and *in situ*, a plethora of information available in the existing systems and data stores, such as documentation and maintenance data.

Publications

Oct 2017 **MARS Framework: Mobile Augmented Reality Scripting Framework** ◪, *2017 24º Encontro Português de Computação Gráfica e Interação (EPCGI)*, Guimarães, Portugal.
DOI: 10.1109/EPCGI.2017.8124302

Languages

Portuguese   Native / Bilingual

English	Bilingual
German	A1 Level

IT Skills

Programming Languages	C/C++, C#, Java, JavaScript, Typescript, Python, SQL	Software Engineering	Specification, Development and Maintenance, Optimisation
Specializations	OpenGL, VR, AR, MR, HPC	Software Experience	Unity, Unreal, Node.JS, Angular, Android, Vuforia, Docker