

DAVID E. RODRIGUEZ

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PROFILE

I am an Emmy Award winning, highly skilled, and experienced Software Engineer with a passion for Interactive (VR/AR/XR/3D), Mobile, and FullStack Web technologies. I've been programming for over 20 years and love to solve interesting problems in creative ways with code. I love to design software architectures and frameworks that allow engineers to scale / maintain their codebases as a team grows and I know when and how to apply unit/integration testing methodologies. I know the life-cycles of product development and love to create tools and products that artists and the public can enjoy and use to make their lives better. I am a quick learner and can quickly apply design and architectural patterns to new languages / platforms and I love to continuously expand my skillset. I am a dedicated and hard working individual with great communication skills and exceptional attention to detail. I also know how to lead teams to perform their best by encouraging and empowering everyone on the team and supporting each individual's needs and skills. Outside of software development, I love to create and play music through Ableton and I love to sing / play guitar.

WORK EXPERIENCE

SENIOR PRINCIPAL ENGINEER, WAVEXR INC; REMOTE / NJ

— 4/2021 TO PRESENT

- Develop software solutions for the future of live interactive virtual music experiences.

DIRECTOR INTERACTIVE SOFTWARE, MADISON SQUARE GARDEN VENTURES; NEW YORK, NY

— 12/2018 TO 2/2021

- Manage direction and roadmaps for software focused on gaming / interactive technologies for MSG Sphere.
- Grow and Lead a bi-coastal (CA/NY) team of engineers including software developers, technical artists, and QA to create high quality R&D game prototypes, tools, applications, and proofs of concepts on windows, mobile iOS/Android, VR, and AR platforms.
- Define the architecture, processes, and technical design of interactive software alongside project managers, creatives, and engineers in addition to adjacent engineering teams
- Design and architect hardware tools and infrastructure for our software engineers
- Present findings and progress to executives and other stakeholders at regular intervals
- Maintain regular and defined communication with Engineering leadership team on progress and problems in development and deliverables timeline, team management and all interactive software team scope
- Work alongside industry partners and experts to define and manage scopes of work and partnerships
- Maintain an inclusive process that empowers the entire team to contribute to final results
- MSG Ventures was created to advance MSG's goals of creating MSG Sphere, the "venue of the future", exploring and creating technologies that redefine the limits of interactivity, connectivity, video, acoustics, and content distribution, with the ultimate goal of creating immersive experiences that take place before, during and after an event.

PRINCIPAL INTERACTIVE ENGINEER (SOFTWARE), MADISON SQUARE GARDEN VENTURES; NEW YORK, NY

— 11/2017 TO 12/2018

- Lead software development of real-time / interactive Simulation and Visualization technologies for MSG Sphere.
- Design and develop a suite of Virtual Reality and Mobile 3D Interactive Simulation tools
- Develop a modular code base to create and support multiple products for interactive content review
- Grow and Lead a team of software engineers to develop a suite of internally used artist tools.
- Prototype cutting-edge products and perform due-diligence on novel technologies that can be applied to our venue.
- Create modular 3D scenes with imported mesh/texture assets, programmatically clean up mesh data, create custom programmed vertex and fragment shaders to support spherical video playback, create custom UI for use in both VR and Desktop environments, and architect scalable, modular, and reusable codebase for this suite of products.
- Code profiling to measure and improve real-time performance across the suite including VR and iPad apps.
- Support various headsets including the HTC Vive, HTC Vive Pro, HP Reverb, and Oculus Rift.

- Develop various internal prototypes utilizing various VR/AR HMDs, Mobile AR, and other internal installations for use by internal teams.
- Provided development and production software support at various “Science Fairs” meant to show off our technologies to the press, investors, artists, and partners in NY (Radio City Music Hall), LA (The LA Forum), London, and Las Vegas.

LEAD IOS/ANDROID MOBILE ENGINEER, LEGALSHIELD; NEW YORK, NY

— 9/2015 TO 10/2017

- Lead our technology direction and architectural best practices for our iOS and Android apps that reach over 1.5 million of our members.
- Responsible for overseeing and mentoring all mobile engineers and have grown and trained our initial mobile team of 2 into now 7 mobile engineers and multiple interns.
- Work side by side with product, design, QA, and our VP of engineering following an Agile SCRUM process to groom our backlog and ensure that our projects are properly storied, estimated, and ready for engineering sprint planning.
- Code various native iOS and Android applications using Swift, Objective C, Java, and Kotlin.
- Converted our engineering process to use continuous integration to be able to deploy with a single click and ensured that unit and integration tests were written for all mobile applications to minimize bugs and reduce regressions.
- Interact with and code various backend stacks including NodeJS/Mongo, Ruby/Rails, and Java.
- Ferrazzi Greenlight “Movement Leader” who is Certified to teach back these practices. This involved over 6 months of in depth training to become trusted advisors of the company who can build trust, create accountability, and drive strategically important results for the company by creating High Impact Teams.
- Collaborate with VP of Engineering to spread what I learned as a Movement Leader to all the other Executives in the company and in charge of helping the other 7 tech leads who each manage their own teams become more effective leaders.

LEAD IOS/ANDROID MOBILE CONSULTANT, RADICAL MEDIA; NEW YORK, NY

— 5/2015 TO 9/2015

- Lead software development consultant for the American Express UNSTAGED app through Radical Media
- Designed the mobile app’s architecture and technology direction
- Worked with my team to code the app using native iOS and Android SDKs using Objective C and Java
- Helped coordinate the backend and mobile teams to meet our milestones and deliver on time
- Created tools to design experiences for the band Disclosure in the “Disclose Your Face” activation

CTO / LEAD DEVELOPER, SNAPOGEE; NEW YORK, NY

— 3/2013 TO 11/2015

- Designed, coded and managed the full development stack for the social network.
- Created a backend API from scratch using NodeJS and Javascript including an OAuth system for Authentication, ACL Permissions on objects, data management systems using MongoDB, and many REST API Endpoints.
- Designed and coded Snapogee Central, an iOS application to communicate with our API. This application used many technologies such as AFNetworking, AVFoundation, UIKit, CoreData, CoreGraphics, and more.
- Designed and coded Puzzle Pics, a 2D Game for Children using Cocos2Dx for cross-platform development using C++. This game communicates with our API for creating new gaming experiences using family photos sent from Snapogee Central.
- Designed and coded an AngularJS Responsive Website using an Express NodeJS backend that connects to our API server. Created a “web-app” that is cross-platform to access the social network.
- Deployed the entire stack using DevOps techniques such as build scripts and one click deploy to our backend servers.
- Managed and guided a team of 8 core-team members in the company’s technological direction.

APPLE OSX & IOS APPLICATION DEVELOPMENT CONSULTANT, LOCAL WISDOM; PRINCETON, NJ

— 11/2013 TO 2/2015

- Provided app development services for Local Wisdom (<http://localwisdom.com>).
- Interacted directly with staff to convert their designs and concepts into working applications.
- Supported the code for their Cocos2dx engine used in their iOS and Android Weatherwise applications.
- Coded a new Mac OSX Native Photoshop-like Editor using Cocoa (Objective-C) and Cocos2dx (C++) from Local Wisdom’s design that allows artists to create and modify themes for their iOS/Android Weatherwise App.
- Designed and Architected a configurable and responsive view system for the editor to allow for customizable panels and reposition-able workspaces for the artists
- Created new particle and animation system engines in Cocos2Dx that allow for new type of emitters, animated particles, animation packing, and even configurable variables that respond to weather data on the fly.

- Coded a new timeline engine to allow artists to use the Mac editor to control and schedule Cocos2Dx actions and animations. This engine also allows for on the fly asset changes in response to weather data.
- Coded a template engine that allows artists to store and reuse their best animations, particle systems, layers, motion paths, and other such assets easily.
- Designed a new Core-Data backed file format and appropriate backwards compatibility systems to ensure the ability for artists to continue upgrading and using new features of the editor without a problem. This system also allows for unlimited undo/redo operations and final exporting to the appropriate compressed file package to be easily imported into the iOS/Android Weatherwise apps.
- Provided debugging and bug fix support and application profiling for speed improvements.

IOS, ANDROID, UNITY MOBILE APPLICATION DEVELOPMENT CONSULTANT, RADICAL MEDIA; NEW YORK, NY
— 9/2014 TO 11/2014

- Provided software development services for American Express UNSTAGED: Taylor Swift Experience through Radical Media (<http://radicalmedia.com>)
- Co-created the app's programming architecture using C# in the Unity 3D engine, Objective-C for native iOS, and Java for native Android implementation - Co-developed an internal audio time-synchronized content management system to automate the creation, placement, and function of a vast amount of images, videos, and audio assets in the app
- Contributed to the programming of an interactive video engine for Unity3D using OpenGL shaders to blend between multiple types of media

MORE WORK, RESEARCH EXPERIENCE, AND AWARDS CONTINUED BELOW.

EDUCATION

NEW JERSEY INSTITUTE OF TECHNOLOGY; NEWARK, NJ

— 9/2004 TO 5/2010

- Major 1: Computer Engineering (Concentration: Advanced Computer Architecture) — May 2010 BSc
- Major 2: Applied Physics (Concentration: Optical Science and Engineering) — May 2010 BSc

SKILLS & PROFICIENCIES (MOST RECENT)

Most recently I've been developing Interactive VR/AR/XR/3D software primarily in Unity (C#) and some Unreal (C++), with prior experience using other frameworks / SDKs (Cocos2D-x (C++), Crytek engine (C++), OGRE3D (C++), OpenGL(C++)). I have developed Mobile iOS and Android applications for mobile devices and tablets directly using Swift/Objective-C and Kotlin/Java, with a heavy preference for iOS development. For FullStack client/server web development, I have strengths in NodeJS, Express, and MongoDB along with a few front-end frameworks (Angular, JQuery, ES6/HTML5/CSS, currently learning React) and have prior experience using LAMP stacks. I have deep experience with creating and using RESTful APIs, creating SDKs, and have setup and managed Heroku and AWS deployments. I also have prior experience in hardware / electronic design and building software and tools for robotics and motion control systems.

PROGRAMMING LANGUAGES: Swift, C#, Javascript, C/C++, Objective C, Kotlin, Java, HTML, CSS, Python

PROGRAMMING FRAMEWORKS: Unity 3D, iOS SDK, Android SDK, Unreal 4, SteamVR, Oculus, Windows Mixed Reality (WMR), Lumin OS (Magic Leap), AR Kit, AR Core, Cocoa (Mac OSX), NodeJS, Express, Angular, JQuery, Express, MongoDB, Redis, AWS, Heroku, Analytics Frameworks (Google Analytics, Google Data Studio, Grafana, New Relic, Mixpanel), REST API Integration, Clean Architecture Concepts (MVVM, MVP, MVC), Automated Unit / Integration Testing (XCTest / Nimble, JUnit, Mocha/Chai/Sinon, Selenium), CI/CD Pipelines (Jenkins, BuddyBuild, CircleCI, Travis CI, Unity Cloud Build), Multi-Threaded Design & Programming, Low-Level Micro-Controller Programming

COMPUTER SOFTWARE: Editors / IDEs (Unity 3D, Unreal 4, XCode, Visual Studio / Code, Android Studio, IntelliJ), Version Control (Git, Perforce, Github/Bitbucket), Project Management (Atlassian JIRA / Confluence, Pivotal Tracker, TestRail), Linux, MAC OS X, Windows 10, Photoshop, Ableton Live, Blender, SteamVR, Oculus

ELECTRONICS / HARDWARE: 7+ years experience in designing electronic circuits. Designing Schematics & Printed circuit boards, Implementing Micro-Controller Designs (ATMEL, PIC, ARM), Circuit analysis, Circuit Simulation. Provisioning Servers (Windows, NVidia, Linux, AWS, Heroku). VR/AR HMDs (HTC Vive Pro, Valve Index, WMR HMDs - HP Reverb, Oculus Quest, Magic Leap, Hololens)

LANGUAGES: English (Fluent), Spanish (Fluent), Japanese (Elementary), French (Elementary)

WORK EXPERIENCE (CONTINUED...)

SENIOR IOS & MOBILE DEVELOPER, RADICAL MEDIA; NEW YORK, NY

— 2/2013 TO 8/2013

- Architected and Developed a new iOS framework for internal and client projects
- Contributed to new app designs for music artists.
- Explored and coded iOS demos for presenting various technologies to clients.
- Worked directly with producers and CTO to guide mobile technology deliverables and expectations.
- Managed new interns and provided direct support to help them improve their iOS skills and expertise by creating new internal projects for the company.
- Created new and interesting visualizations and various projects using C++ using Cocos2Dx for 2d and 3d applications.
- Researched and coded a new augmented reality social application that allows artists to "virtually" create drawings using their phone on real life objects.

IOS CONSULTANT, FORGE42; ELMWOOD PARK, NJ

— 1/2011 TO 07/2018

- Design & create products for iOS and Web mobile technologies.
- Code various iPhone & iPad applications using Objective C and integrated with various 3rd party APIs.
- Perform all application development using many up to date technologies.
- Provide consulting services for mobile/web projects and patents.

CO-ORGANIZER, MOBILEDEVNJ; HOBOKEN, NJ

— 1/2011 TO 9/2013

- Created a monthly meetup that provides valuable networking and learning opportunities every month to new and experienced iOS mobile developers and programmers looking to increase their knowledge of mobile development.
- Presented various topics of iPhone/iPad and general mobile Development.
- Performed various code audits and help other programmers in the group with their iOS mobile applications.

LEAD SOFTWARE DEVELOPER, METROFLATS INC.; CEDAR GROVE, NJ

— 6/2010 TO 11/2010

- Designed, coded and oversaw website development for Online Vacation Rentals Startup
- Responsible for product development design, management, and programming.
- Managed a team of programmers and interns to implement new features in the system's frontend and backend in PHP using the CodeIgniter Framework.
- Implemented payment systems through a third party REST API for rental property payments.

RESEARCH AND DEVELOPMENT ENGINEER, AMANO CINCINNATI INC.; ROSELAND, NJ

— 5/2009 TO 2/2010

- Designed and Implemented prototypes for new Time Recorder devices and brought existing technologies up to date with ROHS standards.
- Responsible for researching product compliance with EMC/Safety regulations and standards.
- Developed and prototyped novel solutions to previously unsolved sensor quality and manufacturing problems in older Time Recorder systems.

PHYSICS RESEARCHER, NJIT PHYSICS DEPARTMENT; NEWARK, NJ

— 5/2008 TO 1/2009

- Responsible for designing, building and analyzing Terahertz (THz) laser experiments for publication.
- Built automated measurement system and software to perform hourly non-stop measurements of a scanning THz laser system.
- Designed and coded software in MATLAB to extract videos from vast amounts of THz measurement data and perform time elapsed image analysis.
- Setup a clean room for electronic circuit printer and performed printed electronics circuit analysis and calibration.

APPLICATIONS ENGINEER, FABER INDUSTRIAL TECHNOLOGIES; CLIFTON, NJ

— 8/2007 TO 5/2008

- Designed, built, coded and tested motion control and sensing systems for customers.
- Performed on site consulting and programming of motion control systems for Solar Panel Cutters, Museum Displays, and Industrial Machining.

LEAD PROGRAMMER, BTU GAMES/SE INC.; HARRISON, NJ

— 2003 TO 2005

- Coded and Updated the Ubisoft Far Cry Game Engine to create a modern 3D First Person Shooter Video Game.

RESEARCH EXPERIENCE

SMALL AUTONOMOUS ROBOTIC AIRCRAFT, NJIT

— 2008 TO 2009

- Researched, Designed, and Built a low cost small (2x2ft) four-rotor helicopter to fly autonomously.
- Coded Interface and Control Systems for the helicopter to navigate around obstacles to a destination using sensors without human intervention.
- Presented research and took first place at the Electrical and Computer Engineering (ECE) Senior Project Design Workshop at NJIT.

NON-DESTRUCTIVE MEASUREMENT OF WATER DIFFUSION IN NATURAL CORK ENCLOSURES USING TERAHERTZ SPECTROSCOPY AND IMAGING, NJIT

— 2008 TO 2010

- Performed multiple experiments using Terahertz/Millimeter-wave lasers to non-destructively probe and image the diffusion of water through cork.
- Designed & programmed a system to automate the imaging of the diffusion of water through cork samples.
- Designed and implemented software to process vast amounts of imaging and spectroscopic data to analyze the time and spatial distribution of water throughout the cork cells. Diffusion coefficients for cork are extracted from this analysis.
- Abstract: Terahertz (THz) imaging enables non-destructive evaluation of many materials' internal structures which could not be probed by visual analysis alone. In this paper, we apply THz imaging to non-destructively probe and image the diffusion of water through natural cork samples. The temporal and spatial distribution of water is analyzed as it diffuses throughout the cork structure. An average diffusion coefficient comparable to previous work in the field is extracted from this analysis. Data is also presented to show that the diffusion coefficient is not uniform throughout the cork but changes dramatically due to the local structure and composition of the cork.
- Research Paper published in *Journal of Infrared, Millimeter, and Terahertz Waves, Volume 32, Issue 4, pp.513-527*

TEAM LEADER OF HIGHLANDER RACING, DARPA URBAN CHALLENGE COMPETITOR, NJIT

— 2004 TO 2008

- Designed, Coded, and Outfitted a 2000 Chevy Blazer to drive autonomously, without any human interaction, through a city landscape while obeying traffic laws to compete in a nationwide challenge hosted by the Defense Advanced Research Projects Agency(DARPA) part of the Department of Defense(DOD).
- Managed and mentored a team of 30 students.
- Designed, implemented, and maintained vehicle control hardware and software for throttle, brake, shifter, and steering motors.
- Implemented and designed algorithms to allow the vehicle, using sensor input, to plan routes and perform high-level intelligent maneuvers around its environment.
- Presented technology to press, professors, high school open houses, club fairs, ECE Day and other events.
- Recruited over half a million dollars in equipment and donations from and worked alongside various companies including IBM, General Motors, BAE Systems, Kearfott Corp, L3 Communications, Preco Systems, SICK Sensor Intelligence, Faber Industrial Technologies, Parker Hannifin Corp, NovAtel Inc, Agilent Technologies, OmniSTAR and NJIT.
- One of only 10 teams featured in a Discovery Channel Special: RoboCars which premiered July, 2008.

AWARDS

2007: Ronald E. McNair Excellence Award, NJIT

2008: Saul K. Fenster Innovation in Design Award, NJIT

2008: Ronald E. McNair Distinguished Scholar Award, NJIT

2009: First Place at Electrical & Computer Engineering Senior Design Workshop, NJIT

2015: Creative Arts Emmy for Outstanding Creative Achievement in Interactive Media, Radical Media – Original Interactive Program for "American Express UNSTAGED: Taylor Swift Experience" iOS and Android apps

2017: Certified Ferrazzi Greenlight "Movement Leader", LegalShield – Trusted advisor who can build trust, create accountability, and drive strategically important results for the company.