

Micheal Lanham

Augmented Reality Game Development

Create your own augmented reality games
from scratch with Unity 5



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Augmented Reality Game Development

The heyday of location-based Augmented Reality (AR) games is upon us. They have been around for a few years, but the release of Pokémon Go was a gamechanger that catalyzed the market and led to a massive surge in demand. Now is the time for novice and experienced developers alike to turn their good ideas into AR mobile games and meet this demand!

The genre of location-based AR games introduces a new platform and technical challenges, but this book will help simplify those challenges and show how to maximize your game audience.

This book will take you on a journey through building a location-based AR game that addresses the core technical concepts: GIS fundamentals, mobile device GPS, mapping, map textures in Unity, mobile device camera, camera textures in Unity, accessing location-based services, and other useful Unity tips. The technical material also discusses what is necessary for further development to create a multiplayer version of the game. At the end, you will be presented with troubleshooting techniques in case you get into trouble and need a little help.

Things you will learn:

- Build a location-based augmented reality game called Foodie Go
- Animate a player's avatar on a map
- Use the mobile device's camera as a game background
- Implement database persistence with SQLite4Unity3D to carry inventory items across game sessions
- Create basic UI elements for the game, inventory, menu, and settings
- Perform location and content searches against the Google Places API
- Enhance the game's mood by adding visual shader effects
- Extend the game by adding multiplayer networking and other enhancements

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Micheal Lanham is a solutions architect with petroWEB and currently resides in Calgary, Alberta in Canada. In his current role he develops integrated GIS applications with advanced spatial search capabilities. He has worked as a professional and amateur game developer building desktop and mobile games for over 15 years. In 2007, Micheal was introduced to Unity 3D and has been an avid fan and developer ever since.

To the people I think about every day. My everything, Rhonda and children: Colton, Breann, Mikayla, and Charliegh.

About the Reviewer

Derek Lam is a game designer and Unity Certified Developer who has experience in game design on iOS and Android for over 5 years. In addition, he has a lot of experience in developing augmented reality as well as virtual reality applications. He's currently working in a construction company, producing AR and VR interactive applications, mostly for internal usage.

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Preface

At the beginning of 2016, most of the world had very little knowledge of augmented reality and location-based games. That, of course, all changed with the release of Pokemon Go later that year. Literally overnight, the genre became entrenched as an upcoming trend in game development. Chances are you have played Pokemon Go and the reason you are reading this book is because of your interest in the genre of AR and location-based games.

In this book we will explore in detail the aspects of creating a location-based AR game just like Pokemon Go. Location-based AR games are expensive and require multiple services for everything from mapping to spawning monsters. However, the game we develop will be done with zero budget using freely available services. While this may not be something you could release commercially, due to some licensing restrictions, it will certainly introduce you to most of the concepts. Along the way, you will also learn how to use a great tool, Unity, and introduce many other concepts in game development.

What this book covers

Chapter 1, *Getting Started*, introduces the concepts that make up the genre of location-based AR games and our fictional game, Foody Go. This will be followed by a walk-through of downloading all the required software and setting up your mobile development environment with Unity.

Chapter 2, *Mapping the Player's Location*, starts by introducing the fundamental concepts of GIS, GPS, and mapping. Then shows how those concepts are applied to generating a real-time map and plotting the player's location in a game.

Chapter 3, *Making the Avatar*, builds on the previous chapter and transforms our simple location marker into a moving animated character. This allows the player to see their avatar move around the map as they move carrying their mobile device.

Chapter 4, *Spawning the Catch*, explains that the premise of Foody Go is about catching experimental monsters. In this chapters, we learn how to spawn the monsters around the player on the map.

Chapter 5, *Catching the Prey in AR*, ups the intensity by introducing integrated AR part of the game by accessing the device's camera, introduces physics for throwing balls, tracking player swiping, using creature reactions, and working with a new game scene.

Chapter 6, *Storing the Catch*, devoted to developing the player's inventory bag, which will hold all the Foody creatures they catch, and other useful items. Here, we walk the reader through adding persistent storage and adding a simple inventory scene.

Chapter 7, *Creating the AR World*, adds locations of interest around the player based on a real-time data service.

Chapter 8, *Interacting with an AR World*, allows the player to interact with the locations of interest. In our simple game, the player will be able to sell their caught monsters.

Chapter 9, *Finishing the Game*, provides the reader with the information on how to finish the game or better yet write their own location-based AR game. For the purposes of this book, we will only develop the demo Foody Go game.

Chapter 10, *Troubleshooting*, cover a number of troubleshooting tips and tricks to overcome those development obstacles. As with any software development exercise, problems always arise.

What you need for this book

In order to follow all the exercises in this book you will need, at a minimum, a computer capable of running Unity 5.4+ and an iOS or Android device capable of running Unity games and equipped with a GPS.

More details about Unity system requirements may be found at: <https://unity3d.com/unity/system-requirements>.

Who this book is for

This book is intended for anyone with an interest in developing their own Pokemon Go, location-based AR game. While this book assumes no prior game development skills or Unity experience, you will need a basic understanding of the C# language or equivalent (C, C++, Java, or JavaScript).

Conventions

In this book, you will find a number of text styles that distinguish between different kinds of information. Here are some examples of these styles and an explanation of their meaning.