

DEVELOPING GAMES ON THE RASPBERRY PI

KENLON, S.: *DEVELOPING GAMES ON THE RASPBERRY PI. App Programming with Lua and LOVE*. New Zealand, Berkeley : Apress, 2019. 319 p. ISBN 978-1-4842-4169-1.

[Patrik Voštinár](#)

The games industry enjoys huge popularity with people of all ages. Students, pupils and even adults play games on computers, consoles and mobile devices. Working with computer science, especially with developing software is nowadays very popular. In almost the whole world there is a lack of specialists for computer science. The solution could be a motivation for studying programming, for example studying developing games. The book is focused on teaching how to develop games on the nowadays very popular and cheap computer Raspberry Pi. In answer to the questions “What is interesting about this book?”, or “Why should we read this book?” this book does not require previous experience or skills with computers or programming. Everything you need to know, you can learn from this book. After reading this book it is possible that you will continue in studying programming, or in case you already have some programming skills, you will gain experience with developing games. The book is interesting also because it uses the very popular and cheap computer Raspberry Pi (35€) for programming.

The book contains 319 pages, which are divided into 14 chapters. Furthermore, each chapter contains homework - additional tasks, which you can do after reading the chapter. The first chapter describes some basic steps about the Raspberry Pi – how to install Linux, first boot and writing your first Lua Script. Through reading about developing games in this book, you will also learn basic Linux commands. To get through this book, you will use Lua as a programming language for developing games. Lua is a small, fast, modern programming language that can be used for everything from system maintenance to graphics and standalone games. It is a leading scripting language in the video game and visual effects industry, and it is used for front-end development in several popular game engines. The programming language C is known for its speed and extensive library support, but it is rarely categorized as easy to use. Compared to language C, programming in Lua is easy to use and fast, and it has the ability to interface smoothly with C libraries¹.

For developing games, it is common that developers use some types of game frameworks. In this book the LOVE engine is used as the game framework, which is an open source framework that leverages the Lua scripting language for developing 2D games.² The other programs used for developing games in this book are GIMP (image editor) LMMS (digital audio workstation) and GIT (distributed version control system). During reading this book you will develop four interesting games: *Rolling Virtual Dice*, *Blackjack*, *Battlejack* and *Roguelike Dungeon Crawler*. The first game *Rolling Virtual Dice* is aimed at learning variables, user input, loop, GUI logic (graphic user interface), mouse events, etc.

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- 1 For more information, see: KURT, J., AORON, B.: *Beginning Lua Programming*. Birmingham, UK : Wrox Press Ltd., 2007.
 - 2 For more information, see: AKINLAJA, D.: *Love for Lua Game Programming*. Birmingham, UK : Packt Publishing Ltd., 2013.

In the second game *Blackjack* you will learn OOP principles and use a card dealer library. The game allows you to click an empty deck of cards to draw a card and compete against the computer in an effort to get as close to 21 without exceeding it.

The next game *Battlejack* is a modified version of Blackjack, the fantasy card game inspired by games like Magic: The Gathering, Hearthstone, Pathfinder Adventure Card Game, and other trading card games. During game play, you click your own deck to draw a card. During your turn, you click and drag cards to either the dealer's stash to cancel out a card in play, or to your own score box to add your card to your own stash. If you attempt to cancel a dealer card out with a less powerful card, nothing happens. You may add power-ups or additional cards to complete the action or click and drag the card back into your hand to continue.

The last game *Roguelike Dungeon Crawler* is an exploration (top-down dungeon or tomb in a fantasy) game with no story, randomly generated levels and monsters, and death is permanent. This game is a good example of how to demonstrate translating the same mechanics from dice and card games into a character-driven video game. Seth Kenlon is a teacher, artist, D&D dungeon master, free software and free culture advocate, and UNIX geek. He has worked in visual effects (VFX) (*The Hobbit*, *Deadpool*, *Valerian*) and computing industries (IBM, Red Hat), often at the same time. He is one of the maintainers of a Slackware-based multimedia production project.

The book is well written. The layout of the chapters and game examples are appropriately selected. The book is a good choice not only for beginners of programming, but also for software engineers, teachers and development professionals looking to up-skill and develop games for Raspberry Pi, Android and iOS. There is only one weakness of this book found – the author does not very often use “comments” on the examples in the source code in the text (in my opinion, he could put more emphasis on using comments). The book has several strengths – for learning programming, it uses the cheap computer Raspberry Pi, the interesting programming language Lua and appropriately selected game examples.

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Author of the review

PaedDr. Patrik Voštinár, PhD.

Matej Bel University

Faculty of Natural Sciences

Tajovského 40

974 01 Banská Bystrica

SLOVAK REPUBLIC

patrik.vostinar@umb.sk



DEATH STRANDING

KOJIMA PRODUCTIONS: *Death Stranding* (PlayStation 4 version). [digital game]. Tokio, Japan : Sony Interactive Entertainment, 2019.

Lucia Škripcová

Death Stranding was, by far, one of, if not the, most anticipated games of this year. Cinematic trailers, cryptic teasers, no clear-cut theme or gameplay trailers combined with a stellar cast of main characters fired something that can almost only be described as mass hysteria. After release though, the audience has since divided into two opposing factions – one part that continues to revere Hideo Kojima and the game and another part that does not seem to ‘get’ the game. The reason is rather simple – Death Stranding as a game does not really fall under any discrete definition, but on the other hand checks all the boxes that make an (arguably great) digital game. In the context of digital game genres, Death Stranding falls under multiple genres at once. It definitely can be considered an action game, but at the same time it’s commonly referred to as a ‘walking simulator’ (this mostly stems from the gaming community at large). Furthermore, it has enough RPG elements to be defined as one, as well as an adventure game. The experience one can gain from playing this game depends rather heavily on one’s experience in these genres and expectations of Death Stranding itself.

The narrative is made in the same hybrid vein. The basic premise is rather simple – in a dystopian future, America is fragmented and the protagonist is the only person that can undertake the quest to make America whole again. The underlying narrative is much more intertwined and complicated, though. It goes into almost absurd details, where the actions of the protagonist not only influence what happens next, but past relationships between other characters as well. We would be hard-pressed to find a similarly complicated narrative in the digital games medium, as this is mostly a hallmark of movies and TV series, together with extraordinary actor casting. The trend to cast popular movie actors and MoCap them into digital games is very prevalent in Death Stranding, but Kojima went a step further and cast high-profile actors instead of the lower-tiered actors that usually get to work on digital games. The characters also refer to their past roles within the game, like Norman Reedus referencing his past TV series *Ride with Norman Reedus* (Picture 1), Mads Mikkelsen referencing *Hannibal* etc. And then there are some easter eggs in the form of some characters which are actual developers from Kojima Productions.

The basic gameplay loop of the game – which is basically completing various fetch- ing quests – by itself, does not sound the most intriguing or the most entertaining. But the way you have to work against the environment, which becomes apparent after the first few barren hours of the game, is very quickly brought to the extreme. The way you have to plan how you tackle various challenges in the environment, e.g. how to tackle slippery slopes, how to manage your load, which can upset your balance if not put on properly, how to use your ladder, how to walk on different types of ground (grassy, rocky, etc.), is completely unique and really can make or break your quest completion.



Picture 1: Ride with Norman Reedus reference
 Source: author's screenshot

What really makes the game unique is how Kojima Productions works with the atmosphere. As the player, you feel constantly consternated, which sounds paradoxical, as Death Stranding is an open-world game, but it is true. The motifs used, as the name suggests, work a lot with darkness, death or the iconography of death and decay. What it accomplishes is to make the player feel a sense of slightness within the world. This is exacerbated by the sceneries the player has to walk through when playing the game, by the ambient music and by the frequent scanner checking. The scanner is used to check whether enemies, which almost look like Lovecraftian beasts, are anywhere nearby. This all is put into an excellent visual package, which almost evokes classic art pieces and their interpretations of humans within the time flow.

Another interesting facet of the game is how it breaks the fourth wall. One of the ways it does so is in-game advertising. While not as common in current games, Death Stranding has found how to use it in-game, as with the energy drinks brand *Monster Energy* (Picture 2).



Picture 2: In-game advertising of Monster Energy drinks
 Source: author's screenshot

Energy drinks from this brand in-game, when drunk, boost the player's stamina. Other than in-game advertising, there are a plethora of smaller references and Easter eggs on other games and movies. The most obvious ones are the references to Kojima's own *Metal Gear Solid* franchise, or to *Horizon: Zero Dawn*. The game also references the Guillermo del Toro movie *The Shape of Water*. And lastly, the interaction between the in-game protagonist and the player himself is also quite novel. There are instances, where Sam (the main character) will deliberately blink at the player, call him to see something closer up and interact in other slight ways towards the camera, and therefore the player. Probably the most unique interaction with the player is when Clifford (the antagonist) actually wishes you a happy birthday, if the PS4 system registers, that your birthday is, in fact, on said day.

Death Stranding is a greatly unique piece of digital game art, which might not be to everyone's taste. It is more a show of freedom than anything else and shows you the product that is created by detaching oneself from imaginative expectations. The atmosphere, narrative and the gameplay mechanics create a unique masterpiece, which some people might only start to appreciate only once they finish it and look back at it.

Author of the review

Mgr. et Bc. Lucia Škripcová, PhD.

University of Ss. Cyril and Methodius in Trnava

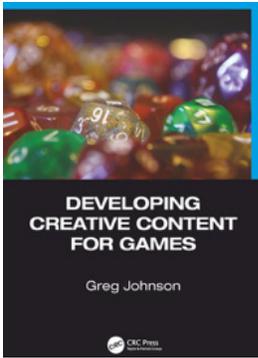
Faculty of Mass Media Communication

Námestie J. Herdu 2

917 01 Trnava

SLOVAK REPUBLIC

lucia.skripcova@gmail.com



DEVELOPING CREATIVE CONTENT FOR GAMES

JOHNSON, G.: *Developing Creative Content for Games*. Boca Raton, FL : Taylor & Francis, 2019. 296 p. ISBN 978-1-4987-7766-7.

Nikola Kaňuková

Author Greg Johnson is a game designer, artist and Professor of Game Development and Computer Art. He has 20 years' experience in teaching thousands of students in game design, digital sculpture, programming, 3D modelling and animation. In the book *Developing Creative Content for Games* he offers a compilation of material developed from his introduction to game development lectures as well as much advice for game developers. Greg is also the author of the ENnie-nominated *TOONZY!*. It is a cartoon role-playing game where you can become your favourite cartoon character in funny and hilarious settings and in which you encounter bizarre scenarios.¹ The main purpose of the title *Developing Creative Content for Games* is to take a reader, especially a student, through the whole process of game development and make them able to create specific parts of their own role-playing games.

According to Greg's official website², the artworks and his publications reflect themes like aviation, science, history and science fiction as well a smattering of abstract and commercial pieces. Greg's interest in table-top role-playing games is devoted to the early edition of *Dungeon & Dragons* which is the game he mentions a lot in the book. Firstly, he is taking a reader through Definitions, Systems, Mechanics and Dynamics where he explains the basic characteristics of table top role-playing games (RPG) and massively multiplayer online role-playing games (MMORPG) regarding their common features. As it is written in the pre-face, the material in its complexity is suitable for students with no practical skills and the author himself wants the book to be an education in itself. A wide range of chapters and topics lead to way in teaching games to students. On the other hand the material is not for people who are interested in more complicated tasks, e.g., in making a full 3-D video game, because it takes a year or more to put together a pro title and it is a job for a whole professional team. Anyway, the book describes complicated processes of game development because every single element is covered in depth and it takes readers deeply into an understanding of those processes. Greg puts an emphasis on learning by doing methods and after each chapter there is a nice guide with tasks and assignments by which the author encourages readers to such practical actions as playing specific games, discussing the ideas in the group of people, creating an outline of the imaginary world, characters, obstacles etc. (p. 136).

After defining the history and basic features of the game development process, the reader can start to think about creating their own game. Chapter 4 (p. 31) helps at the beginning with some advice about choosing the right game and game system. This first step requires many weeks of playtesting. Before you can start working on your own adventure,

1 For more information, see: JOHNSON, G., LEWONSKI, A., SELTZER, J. J., BETANCOURT, M.: *TOONZY!*. Savannah : Genres Game System LLC, 2015.

2 For more information, see: *About the project*. [online]. [2019-11-15]. Available at: <www.gregtheartist.com>.

you will also need to choose which rule set to use. There are plenty you can choose from and over a few pages (p. 32-36) the author introduces a few of them. The second step after establishing the groundwork is to get creative and do a little brainstorming about adventure ideas for role-playing games. For better understanding your game you need to know everything including the whole background. Greg's example talks about the game *Glory of Yore RPG*³ which is a fantasy role-playing game in the world of a legendary British leader. Since you are inspired by this game, you have to be educated and skilled enough to make your own adventure compatible with a somewhat generic King Arthur-based fantasy setting. Having a great idea does not mean it will be as easy as it seems. It takes considerable effort and a whole lot of trial and error (p. 39).

In chapter 6 the students receive such game design basics as knowing the most relevant game development theories, e.g., The Magic Circle which indicates the space containing a play-ground⁴ which relates to the broader sense of human culture and various models of human psychology and sociology (p. 49). A great help for understanding the process of game design and development indeed is Mechanics-Dynamics-Aesthetics (MDA Theory)⁵ which visualizes how information flows from the game designer to the player and how important are the roles of every single person in the team (p. 51). Understanding these kinds of processes you are able to create a final game concept document, set the philosophy of play and describe the principles behind your adventure. Coming up with a game concept document the reader is forced to identify the target group and the selling points of his/her product.

In order to take the readers deeply inside the topic they have to think about immersion. A game developer has to become immersed in his fantasy, in his game and make others forget the outside world for a while. They have several choices how to do so, playing with ideas, culture, places or using interesting plots or narratives. The book offers a wide range of detailed types of narrative for your story (p. 104) and one powerful method to weave the story into a game is by providing meaningful choices to the player. This occurs when the player cares about the outcome of each decision (e.g. the game *Paranoia*⁶) and this is the job of the story. Greg puts a big accent on developing elements like victory conditions and goals, encounters, locations, dialogue, rewards or story branches which are good and necessary to know, but students will not get a clear answer on how to make a good story as they may miss some advice or steps about how to proceed to achieve it. Readers find a lot of examples but the book tries to cover an enormous number of topics and it is too hard to do it properly. There are 25 chapters consisting of tens of subheads, some of them within 8 lines. There is no way to explain everything and the reader is missing many things. After reading the book you are not able to create fantastic content for a game, but it is inspirational for later education and development. The book makes students aware of plenty of unnecessary things which they have to think about before and during game development. However, it is really a nice guide for getting to know all the processes and for starting to think about our own business.

The last eight chapters belong to the game finalization phase but only for storytellers. After preparing a great story you have to transform it to the game and begin designing the individual parts. Beginning with writing down the scene list you have to create a map regarding laws of physics and bring your characters to life. The space does not permit the

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- 3 NORELLE, A.: *Glory of Yore: Fantasy Role Playing in the World of King Arthur*. USA : Mad Mutant Games, Inc., 2016, p. 12.
 - 4 HUIZINGA, J.: *Homo Ludens*. London : Routledge & Kegan Paul Ltd., 1949, p. 10.
 - 5 For more information, see: LEBLANC, M.: *Mechanics, Dynamics, Aesthetics: A Formal Approach to Game Design*. [online]. [2019-11-15]. Available at: <<https://users.cs.northwestern.edu/~hunicke/MDA.pdf>>.
 - 6 COSTIKYAN, G., GELBER, D., GOLDBERG, E., VARNEY, A.: *Paranoia*. [digital game]. New York : West End Games, 1994.

inclusion of everything there is to know about page layout, design and production, readers should have enough information to get started and guide them through the process. Preparing the final product is about paying attention to hundreds of details.

Developing Creative Content for Games is designed for students and game developers and provides them with a solid understanding of game development, design, characterization and creation of the elements. Readers do find the analyses and critiques that have come from investigation over tens of years of Greg's experience in practical as well as in academic life. The book is rich, easy and a quick way of learning how to create interesting content for games and all you need to do so, is a notebook, pen or user-friendly text editor for your computer. The only thing left is to ask what kind of creative content for games the reader will learn from this book? Will he excel in the creation of stories, immersion or in design? All these activities are part of developing creative content for games, but it is very ambitious trying to teach it all in 300 pages. For more additional information about Greg Johnson's work and his enthusiasm for table top role-playing games, visit his website www.gregtheartist.com.

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Author of the review

Mgr. Nikola Kaňuková

University of Ss. Cyril and Methodius in Trnava

Faculty of Mass Media Communication

Namestie J. Herdu 2

917 01 Trnava

SLOVAK REPUBLIC

nikakanukova@gmail.com