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# Getting Started with Clickteam Fusion

Create compelling 2D games using Clickteam Fusion

Jürgen Brunner

[PACKT] open source\*  
PUBLISHING community experience distilled

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BIRMINGHAM - MUMBAI

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# About the Author

**Jürgen Brunner** is currently working as a game designer and an indie developer in Austria and Germany. You can definitely call him a *video game enthusiast*, which he has been since the 1980s. Remembering the first gaming sessions on a friend's *Amiga 500*, he tries to stay as connected as possible to the main goal of every game: fun!

He studied game design and music at the University of Applied Sciences in Salzburg, and received his degree in 2010 with the diploma thesis "Jump 'n' Run Evolution".

While working as a researcher at the **Pervasive experience lab (P.e.l.s)** in his former university, he had the privilege of exploring augmented reality and pervasive games as well as Kinect hacks.

Jürgen made his way to the professional gaming industry as a game and level designer in 2012. Besides this, he also works on his own indie games. His love and passion for retro graphics, music, and art can be experienced in every new game and in every new song. The greatest success of his indie career so far might be the release of the award winning game *Pitiri 1977* on Steam in 2014.

Besides working on games, he is also a passionate musician. As well as playing six instruments, Jürgen still tries to spend every free minute on music and sound design, or with his band SaberRider.

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Thanks to Ela, Chrisi, Marti, and Lina. Because of you guys, I feel like Stephen King while writing a book about video games!

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**Jenna Brown** is a graduate from Emily Carr University of Art and Design with a Bachelor of Fine Arts in Animation. When she was young, she learned coding online, and since then has worked to create her own games and projects. She has taught the subject of game designing at several schools, including Digital Media Academy, and taught animation at Capilano University at Summer Fun Camps and Reel to Real Film Festival.

---

I would like to acknowledge my grandfather RK Brown for encouraging me to learn and teaching me that learning new things is a wonderful lifelong adventure. I would also like to acknowledge my family, friends, teachers, students, my mother Shannon, and Toan for encouraging me to create, learn, and teach. Without these people, I would not be creating games, nor would I be reviewing this book. They have my deepest thanks.

---

**Albert Chen** is an Assistant Professor in the Game Design and Development program at Cogswell College in Sunnyvale, California. He has led students in developing serious games using game engines for the Boeing Company, Neurosky, and Ericsson. His team won the Boeing Performance Excellence Award in 2008.

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I would like to thank my family for their love and support: Joy, Kayli, Brandon, and my mother, Sin-Hing Chen.

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**Timothy Hess** has been creating video games since he was a teenager. He began making simple games using Game Factory, and later using Clickteam Fusion. This love of video games and their creation led him to the University of Baltimore, where he earned a BS in Simulation and Digital Entertainment. Recently, he received a MA in Interactive Design and Game Development from the Savannah College of Art and Design. Currently, he is working on a space exploration game using Clickteam Fusion and numerous other endeavors with teams of his colleagues online. Some of his work can be seen by visiting [TimHess3D.com](http://TimHess3D.com).

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# Table of Contents

<b>Preface</b>	<b>1</b>
<b>Chapter 1: The Basics of Fusion</b>	<b>5</b>
<b>About creating a video game</b>	<b>5</b>
<b>Getting to know some terms about the tool</b>	<b>7</b>
The application	7
The frames	7
The objects	8
The properties	8
The events	9
Conditions and actions	9
<b>The basics of the Fusion user interface</b>	<b>10</b>
The top section	11
The left section	11
The center section	11
The right section	11
The bottom section	12
<b>Getting started</b>	<b>12</b>
<b>Summary</b>	<b>13</b>
<b>Chapter 2: The Editors of Fusion – Your First Game!</b>	<b>15</b>
<b>The editors – an overview</b>	<b>15</b>
Opening and navigating through the main editors	15
<b>The frame editor</b>	<b>19</b>
<b>The picture and animation editor</b>	<b>22</b>
<b>The event editor</b>	<b>25</b>
Obstacles	26
Naming	28
Scrolling	28

Shoot 'em up!	29
<b>Summary</b>	<b>31</b>
<b>Chapter 3: Movements, Animations, and Graphics</b>	<b>33</b>
<b>Creating animations – how to blow up crates!</b>	<b>33</b>
<b>Simple particles</b>	<b>36</b>
<b>Clickteam movements</b>	<b>38</b>
Non physical movements	39
The bouncing ball movement	39
The path movement	39
The mouse-controlled movement	39
The eight-directions movement	40
Race car	40
Movement extensions	40
<b>Importing graphics and animations</b>	<b>41</b>
The import options	42
<b>Working with layers</b>	<b>43</b>
<b>Summary</b>	<b>44</b>
<b>Chapter 4: Using Extensions and Animations</b>	<b>45</b>
<b>Extensions and objects</b>	<b>45</b>
<b>The platform movement object</b>	<b>47</b>
The new movement	47
<b>Colliders and character animations</b>	<b>50</b>
Walking animation events	51
<b>Summary</b>	<b>52</b>
<b>Chapter 5: Creating Enemy Behavior and Health Bars in the Right Resolution</b>	<b>53</b>
<b>Setting the resolution</b>	<b>53</b>
<b>Introducing a new game type – top-down</b>	<b>55</b>
<b>Enemy movements</b>	<b>56</b>
The path movement	56
The bouncing ball movement	57
Direction detection – a basic AI	58
<b>Alterable values</b>	<b>58</b>
<b>Interface, counters, and health bars</b>	<b>60</b>
Going further	62
<b>Summary</b>	<b>63</b>
<b>Chapter 6: Physics, Qualifiers, and Implementing a Soundtrack</b>	<b>65</b>
<b>The use of qualifiers</b>	<b>65</b>
<b>Integrating sound in Fusion</b>	<b>67</b>
Place your first sounds	68

---

<b>Jump around – physics!</b>	<b>70</b>
Basic collisions	70
The Physics movement	71
The Physics objects	71
The rope and chain object	72
The ground object	72
The joint object	73
The Physics playground	73
<b>Summary</b>	<b>74</b>
<b>Chapter 7: Creating Loops and Saving Games</b>	<b>75</b>
<b>Creating a basic game loop</b>	<b>75</b>
Creating a game with three frames	76
The start screen	77
The result screen	77
<b>Global values</b>	<b>78</b>
A sneak peak – exporting your game	79
<b>Saving and loading with the INI object</b>	<b>80</b>
Saving positions	81
Saving a single value	81
Saving multiple values in items and groups	82
<b>Fast loops</b>	<b>84</b>
<b>Summary</b>	<b>86</b>
<b>Chapter 8: Exporters of Fusion and Mobile Development</b>	<b>87</b>
<b>Exporters of Fusion</b>	<b>87</b>
Flash (Swf)	89
HTML 5	89
iOS	89
Android/OUYA	90
XNA	90
<b>Development for mobile devices</b>	<b>90</b>
File size and memory usage	91
Mobile control objects	92
The accelerometer object	92
The joystick control object	92
The multiple touch object	93
The location object	93
<b>On the other side of the screen, it all looks so easy</b>	<b>93</b>
<b>Summary</b>	<b>94</b>
<b>Index</b>	<b>95</b>

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# Preface

When I was a kid I wanted to know how to create my own video games. Unfortunately, I wasn't much of a programmer and nobody could really tell me where or how to start my development career. The gaming scene has mainly been appreciated by slightly nerdy kids like myself and the gaming industry has been much smaller than today.

Well, what can I say, times have changed! And video games are a well-respected art form, business, and even lifestyle these days. Together with this scene, the ways of game development have changed and it is much easier to learn how to create video games today.

Of course, not everyone can be a great programmer. You might have great game ideas and artistic skills, but programming, well, let's say it's not your flagship. This is exactly the moment where this very book and Fusion enters your life! Learn how to create awesome 2D games without knowing a scripting language. Understand the basics of game development with Fusion and acquire a solid basis in designing games. Follow your passion and start to create the games you've always wanted to play!

## What this book covers

*Chapter 1, The Basics of Fusion*, will introduce you to the world of game development with Fusion by Clickteam. Learning a new tool is a challenging task. You'll learn the basics of the tool's user interface and how to begin developing games.

*Chapter 2, The Editors of Fusion – Your First Game!*, will give you an overview of the different editors and their usage. Everything in Fusion is constructed to be very intuitive and easy to learn. Still it takes some time to understand the mechanics of the tool.

*Chapter 3, Movements, Animations, and Graphics*, is all about movement and how to breathe life into your game. Understand the basics of animations and the animation editor. One of the most essential benefits of Fusion are its built-in movement templates, which you are about to learn.

*Chapter 4, Using Extensions and Animations*, will teach you how to use colliders and trigger animations. The backbone of Fusion is its extension and objects system. Learn how important it is to use the advanced platform movement object.

*Chapter 5, Creating Enemy Behavior and Health Bars in the Right Resolution*, will help you to decide on a resolution and the right interface for your game. Game development is not all about turning cool ideas into games. There is also a big non game-related technical part and a preproduction phase behind every game. You will also learn some basic enemy behavior.

*Chapter 6, Physics, Qualifiers, and Implementing a Soundtrack*, helps you learn about the use of qualifiers when working with many different objects of the same type, such as enemies, weapons, or plants. To make your games scream, you will implement sounds and music in this chapter. We will even take a look at the basics of Fusion's physics!

*Chapter 7, Creating Loops and Saving Games*, will help you to learn to build a game from the start screen to the result screen, including one of your already created game prototypes. You will also learn how to load and save statistics in your game with the INI object. Global values and simple fast loops will also be covered in this chapter.

*Chapter 8, Exporters of Fusion and Mobile Development*, will help you learn the basics of developing applications for mobile devices. You have already exported some of your prototypes as a standalone executable file. Now it's time to get to know the other export possibilities of Fusion.

## What you need for this book

You will be working with the tool Fusion 2.5 by Clickteam. Fusion is the direct follow-up to the game and application development tool, Clickteam Fusion 2. A lot of tutorials and examples of this book can also be done in Clickteam Fusion 2, which still is a fantastic tool to create 2D games!

Additionally you could use a picture editor of your choice (such as Gimp or Photoshop).

## Who this book is for

This book is for game enthusiasts who want to create their own 2D video games but never had the time or the passion or both to learn a scripting language.

---

## Conventions


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


Code words in text are shown as follows: "Open the event editor and look for your old condition: `On collision between bullet and crate.`"

A block of code is set as follows:

```
When Button 2 is pressed AND the player is facing to direction 0
Launch the bullet to the right with a speed of 100.
```

**New terms** and **important words** are shown in bold. Words that you see on the screen, in menus, or dialog boxes for example, appear in the text like this: "Right-click on the already existing condition **Press fire 2** and select **Insert.**"

 Warnings or important notes appear in a box like this. ]

 Tips and tricks appear like this. ]

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# 1

## The Basics of Fusion

In this chapter, we will cover the following points:

- Creating a video game
- The basics of the Fusion user interface
- Getting started

Learning a new tool is a challenging task. This chapter will introduce you to the world of game development with Fusion by Clickteam. You'll learn the basics of the tools' user interface and how to begin developing games.

### About creating a video game

You want to create video games, and that is awesome! It's as simple as that! Welcome to the circle of game developers! I don't know where your motivation comes from. Maybe your older brother introduced you to video games and you fell in love. Maybe you already are a passionate player. Maybe you just found out about this cool art form or you've always wanted to create your own game, but you just never knew how or where to start. Whatever your reasons are—you are in the exact right place—at the exact right time. I will try my best to assist you in making your dream come true with Fusion!

So let's start with the main question: What is necessary to create a video game?

Well, you obviously own a game development tool if you are reading this book. That's something we can start with! But what I mean is what ingredients do we need to create a game?

There might be some simple steps that we may have to follow when we want to create a game. Nothing can be simpler than that, I guess!

Let's pick a genre first. That might be a good start. This shouldn't be too hard – there are only a couple of genres out there. Platformers, top-down shooter, or RPGs are very common, right?

Think about some cute graphics. Or maybe you want to create a game for a more grown-up audience. Well, in that case, just use some cool, tech, spacey graphics!

What else... let's see... characters of course! We need a likable anti-hero. Or at least a heroic spaceship – armed to the teeth! Let's add some special features you want to see in your game, such as low gravity or a teleportation gun. Be creative! Surprise us!

Some people might call these features the **unique selling proposition (USP)**. So think of what makes your game different? Why should we play your game? This sounds simple, but after so many years of video games, it is actually very hard to invent new features or even better, a new genre!

When it comes to music and sound effects... please do not make the mistake that so many developers do of forgetting the impact and importance of a good soundtrack. Just think of that one game you really love. What happens to you when you hear the title song? What are you feeling? I know it might be hard to describe, and maybe that's exactly the reason why you should really think of the sound effects and the music of your game. I'm sure you want to create that special moment for every single player out there! The following link would be a perfect example for one of my favorite games:

[http://www.youtube.com/watch?v=Ye5TV9pa\\_4Y&feature=share](http://www.youtube.com/watch?v=Ye5TV9pa_4Y&feature=share)

So what have we got? We have the genre, cool graphics, sweet characters or a heroic battleship, awesome features, and a fantastic soundtrack. Did we forget something? Well, what about the idea? The game idea itself!

Never underestimate the idea! There are tons of first person shooters, millions of car or racing games, and thousands of platformers. All great ideas will be cloned and remade sooner or later.

My friends and I have paid homage to a couple of our favorite Jump 'n' Runs with **Pitiri 1977**. But like so many before and aside us, we did not quite reach that level of "Wow!". Oh, that's what I'm going to call it from now on: the level of Wow!

An idea (I might quote a ton of movies and quite a lot of poets at this point) can be more powerful than a million copies of something. Of course, selling a million copies of that very idea can be pretty sweet too, but that's another story. We do not want to make a lot of money in the first place; we want to create a lot of great games, right?

If you have a good idea, work on it. Tweak it. Play around with it until you have that feeling. When you are quite satisfied – show your ideas to others. I would start with close and honest friends. Show it to people who will tell you right away if something is a good idea or a bad one – if something is boring or a great new game! Maybe you are the one with the next breakthrough game!

## Getting to know some terms about the tool

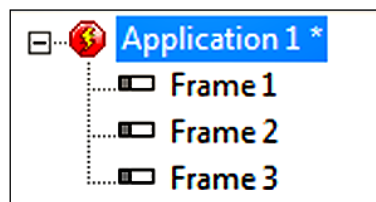
Fusion (followup to Clickteam Fusion 2) is a tool that allows you to create all kinds of games, applications, programs, and even old-school screensavers! And all that without any knowledge of a programming language! Of course, there are some terms that you should know about before we go straight to our first game!

### The application

Fusion creates applications. Call them apps, games, or presentations. Everything you create will be saved as an application with the extension `.mfa` on your hard drive.

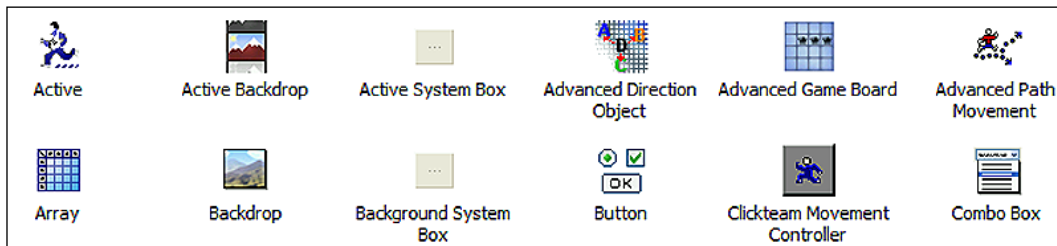
### The frames

Frames correspond to the different screens of your application. They can be levels of a game, sites of a homepage, slides in a multimedia presentation, and so on. Let's take a simple game as an example: the first frame would be the splash screen, the second frame would be the game itself, and the third frame would be the high-score table!



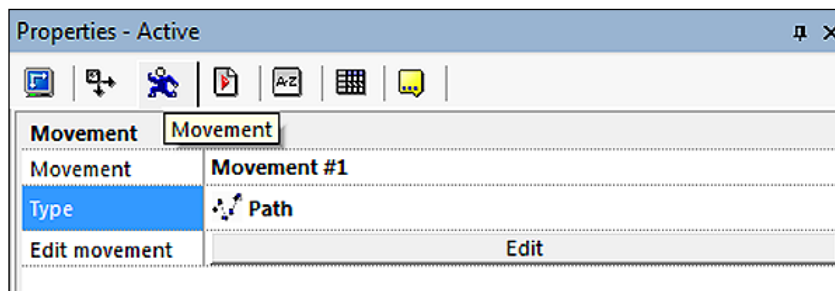
## The objects

Objects are dropped in a frame. They are the different *actors* of your application. Fusion contains a lot of different objects to suit different tasks. For example, an **Active** object can be used as a character in a game; a **String** object can display some text, such as a score; the **Accelerometer** object reads useable data from the gyro sensor of a mobile phone; and so on. Objects are dropped on the frame in the frame editor. Each object can also have a number of conditions, actions, and expressions to control and define how they act while the application is running. The following screenshot shows different types of objects:



## The properties

All objects are defined by their set of properties found in the properties toolbar. Properties consist of adjustable values (texts, options, colors, fonts, and so on) that precisely define your objects' behavior. Just like every object, frames also have customizable properties that define how your application will act when run. The following screenshot shows the **Properties** toolbar:



## The events

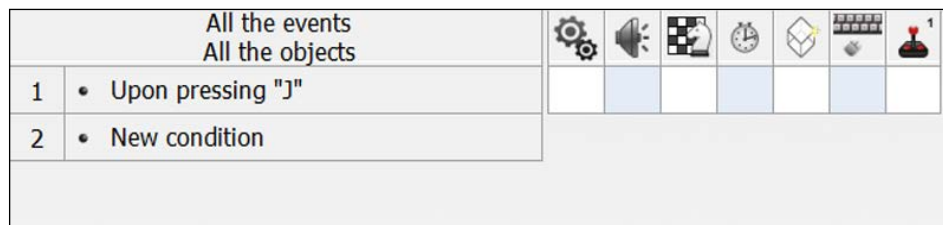
The logic of your application is defined with events. Events will control everything about your objects, such as whether your object should move, play an animation, perform calculations, or be destroyed. You can call the events (and the event editor) "The heart of Fusion"; sounds very epic, doesn't it?

Events – and this is the important part – are the way to program any and all applications in Fusion! You enter and edit the events in the event editor. Events are made of **conditions** and **actions**.

## Conditions and actions

Conditions are simple questions that can be true or false.

**Upon pressing "J"** is be a condition, as you can see in the following screenshot:

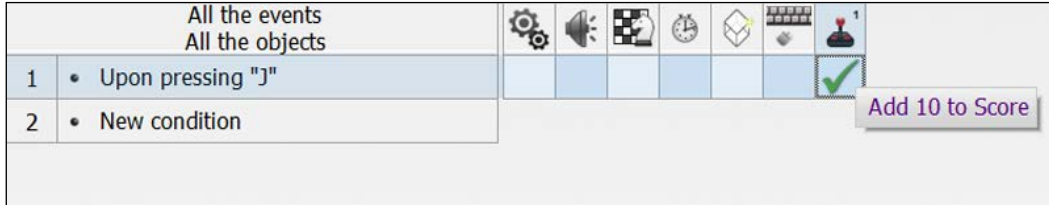


This condition will be set to true if the player presses the key *J* while the application is running. An event can contain more than one condition, each listed after the other. If the first condition is met, Fusion immediately checks to see whether the next conditions are met in descending order. For the event to be considered true, all of the events must be true at the same time. When the conditions of an event are true, the actions of the event are executed.

An action is a task to perform when the conditions are true. *Add 10 to score of player 1* can be our action.

When this action is run, 10 points are added to the score of player 1. An event can also contain more than one action; in that case, they will be executed one after the other.

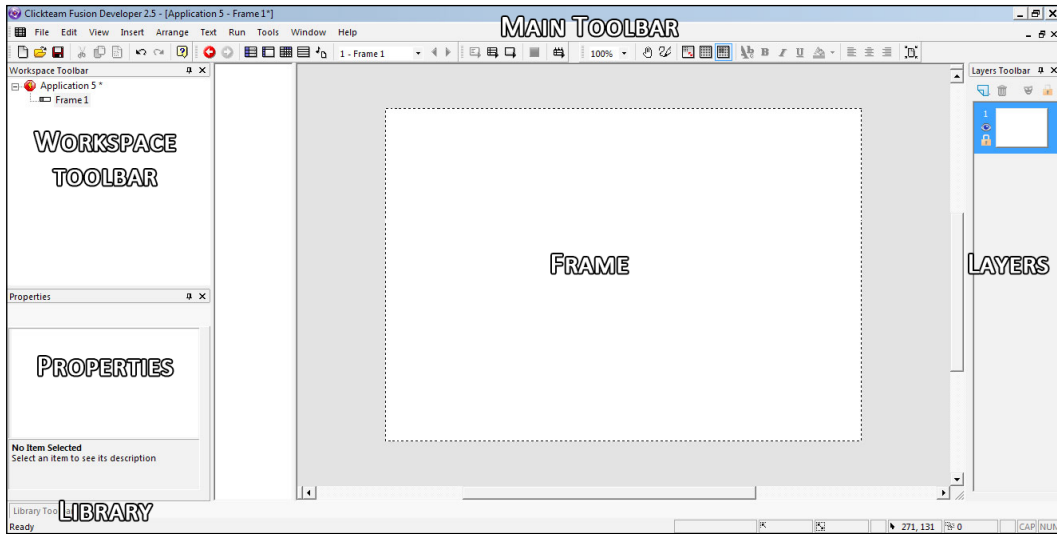
Combine the condition with the action and you get your first event as **Upon pressing "J"** – add 10 to score of player 1:



It's as simple as that! You will work with a lot of those **If... then** events during your development process.

## The basics of the Fusion user interface

As you will see, the interface of every editor in Fusion is built in a similar, very intuitive way. Too many toolbars would be confusing. Fusion reduces the number to a minimum:



## The top section

The main toolbar lets you navigate through Fusion and its editors. Of course, it also includes the standard application elements (new, save, load, and so on), and it also has some options to help with your workspace management. But I really think you will find out about all the options by yourself with time.

## The left section

The **Workspace Toolbar** includes your opened applications (games) and all its frames. This is your main window to manage the frames of your game and switch from scene to scene!

The **Properties** window will show all the properties depending on which object or frame is selected.

## The center section

The frame is where all the action takes place. This is where all your little characters, spaceships, and squirrels (yes, squirrels!) will play around. It's the stage for your protagonists.

## The right section

Add and edit your layers on the right-hand side of the screen. Arrange all your objects on different layers and use layer-specific effects such as parallax scrolling.



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