Fluency with Alice

Workbook to Accompany Snyder's *Fluency with Information Technology, 4th Edition*

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Preface

"For the things we have to learn before we can do them, we learn by doing them." - The Nicomachean Ethics - Aristotle

This workbook is an introduction to Alice and the Alice development environment. Our approach is to introduce you to Alice by developing and exercising your talents for storytelling, creating and directing a movie or a play, and creating a video game. There are a number of textbooks that describe the details of Alice to teach about computers and computer programming. Our approach is different. We want you to learn about *using* Alice to tell animated stories, select characters for your stories, give action to your characters, and have them interact with each other. We provide suggestions and step-by-step guidance about how to set up a story and elaborate on the story by adding more material and details.

Our approach is to immerse you in doing things in Alice right away. It's like learning to ride a bicycle. No matter how much you read about how to ride a bike, including the physics involved, you really don't learn how until you get on and ride it yourself. In this Workbook, you will see lots of screen shots of *what* we'd like you to do. Plus, we've included lots of Flash videos showing you *how* to do things and the results of doing these things. Just click on the links you'll see to open these files in your web browser. You will be prompted if you need the latest Flash player. Here are two example videos for you to try out. {**Video demos**: Video 1-1 & Video 1-3}

> *Tech Talk* – we'll toss in these sidebar comments upon occasion to address technical issues or to use the right word ("*le mot juste"*). The first is "object." Alice worlds are objects. Characters and props in stories are objects in the world. Objects know things and know how to do things. Now that wasn't too technical, was it?

We also invite you to explore the Alice development environment on your own and to that end we provide suggestions about where you might look to find new and interesting things. We don't ignore technical issues and terms. When appropriate, we add *Tech Talk* boxes to explain how technical concepts relate to our approach.

Most of all, we want you to have fun. If you learn something about computers, computer programming, and object technology in the process, that's fine with us. We assume only that you have used a computer and have one available. We hope that you have as much fun using this Workbook as we had writing it.

Note: Alice software is free. Download and installation instructions are in Appendix A.

Introduction

Welcome to the world of the future. As you may have noticed, the world of computers is becoming more graphical with great 3D effects in games and dynamic web sites. You may also have noticed that computer generated graphics are becoming more prominent in movies, advertising and even education. We use Alice, a 3D virtual world environment, so you can explore virtual world-building visually. At the same time, we illustrate some of the skills, concepts and capabilities that underlie the control of all information technology and computer environments.

So, sharpen your creative genius. Put on your director's cap, get out your megaphone – you are about to create something different. In Chapters 1, 2, and 3, we approach Alice primarily as if we are creating a movie or a stage play. You have a stage to set, actors to cast, and of course you must direct them to convey the story you want to tell. The story is in two acts, Act 1 and Act 2. Take a look at the Act 1 animation you will create by the end of Chapter 2: **{Video demo:** Video 2-2}. In Chapter 4, we transition into the world of interactive computer games. Here is an example of a small part of what you will accomplish in this chapter: {**Video demo** (sound on): Video 4-1}.

There are two major differences between Alice world creation and movie making or staging a play. With human actors, you expect them to "act" and to add a dimension to the story without being told – our Alice actors are cartoon characters and you must direct every aspect of their performance. Second, the viewer of a movie is passive – they see the story as you choose to present it. In Alice, you can also give the viewer a participating role. You might give them the ability to control the camera view, put them inside of a character they control, or ask them for input that influences the sequence or even the outcome of the story. This is closer to a video game than a movie or a play. However, even in video games there is storytelling, graphic creation and the need for a director to give life to the world. You will create a video game in Chapter 4.

You will need access to a computer with the Alice software. Alice is free and was created by Carnegie-Mellon University with funding from the National Science Foundation. Appendix A provides you with instructions on how to download Alice and install it on your machine.

Alice comes with a set of tutorials. Feel free to use them to get ideas and to see how some other directors have put together their stories. Here, we do not assume you have explored these tutorials but recommend that you do so. You will get a lot more out of them when you have finished Chapter 4 in this Workbook.

You will want to have Alice running on your computer while you use this *Fluency with Alice* Workbook. If you are reading this Workbook on your computer, then placing two side-by-side windows on the screen may be a good way to proceed, depending on your screen size.

Alice will start off with an empty screen. Think of it as the blank movie screen before someone turns on the projector. Or, as a stage before the characters take their places. You will need to select the setting for your world, for example, green grass or frozen tundra. There are a wide variety of props and locations available – chairs, tables, trees, city-side, country-side, ocean-side, even an amusement park and much more. You can mix and match to taste. And of course there is the casting department where you have a diverse range of people, animals, humanoids, and even extinct creatures to pick from. You will find more of these at the Alice web site "Downloads/Object Gallery" at http://Alice.org. In theory you can create your own, but that is beyond the scope of this Workbook, and requires commercial software at this point in time.

You know the movie cliché: "lights – camera – action." But consider what happens before the lights go on. There is a story to create, characters to select, a stage to set, actors must be given their lines and stage directions. Each element is in your hands – it is your world. This Workbook shows you how to create a story world using Alice software and how to import pictures and sound into your world.

Each prop or character (both referred to as an **object**) has a list of "*methods*" (things it can do) and "properties" (such as color, size and transparency level). You direct your actors in terms of the things they already know how to do. You can have their actions depend upon external events or the actions of other characters. You can have your actors repeat actions multiple times or until some objective is accomplished. You can have multiple characters acting at the same time. You can define new capabilities for your characters constructed from the existing repertoire of directions.

Your actors have sub-parts you can control as well – hands attached to arms, or multipart tails you can have them twitch. Many of the defined methods are the same for each object giving you some unusual choices. Buildings can leap superman in a single bound, the trees can speak, and an actor's body parts can travel in different directions. How you use these diverse options to tell your story is your choice.

Experiment and enjoy!

Note to the Instructor

There are lots of ways to "teach" Alice to your students. One approach is to turn them loose with this Workbook. They will quickly become immersed in a 3D interactive world that they can design, implement and control. Another is to have structured labwork.

Depending upon your course schedule, you may find that you do not have enough time to cover all four chapters. That's ok. Covering Chapters 1, 2 and 4 will give students what they need to get a good feel for computer programming and will get them into creating interactive games using Alice.

Alice 2.2 downloads with four very nice tutorials. We recommend that students take these tutorials after they have finished with Chapter 4 in the Workbook.

There is some good research beginning to emerge that shows that working in pairs is an effective way to learn computer programming. You can find some of this research in journals such as the *Journal of Educational Computing Research*. We are very fond of group work and have incorporated some group oriented exercises into the Workbook chapters.

You may be using a computer lab with your classes. In which case, you will want your computer support people to make sure that the latest version of Alice 2.2 is installed in the lab. [This workbook does not cover Alice 3 which is significantly different than Alice 2.2.] Students can easily install Alice 2.2 on their own computers from http://alice.org. See Appendix A.

One thing you may want to emphasize to your students, and your computer support people, is that Alice does not install and uninstall like most other computer software. Alice downloads in a zip file containing two executable files: "Alice" (which most students will use) and "SlowAndSteadyAlice." The download file also contains a folder named "Required." The two executable files and the Required folder must always reside together in the same containing folder. We like placing them all in a folder named "Alice" on the computer desktop for easy access.

Alice program files have an *a2w* extension. They cannot be opened directly by double-clicking on their icon. They can only be opened from within the Alice program (i.e., File/Open World). Also, we have found that when we change the screen resolution of an open Alice window, Alice sometimes freezes. This will be most bothersome for those students who shuffle Alice between two monitors while doing their Alice work.

Also, it is possible to File/Open World over and over again. But, doing this more than a few times seems to slow things down and can cause other issues. We recommend exiting and then launching Alice again after three repeated file openings.

Other than these minor idiosyncratic traits, we find Alice 2.2 to be fairly stable. A big plus of Alice 2.2 over Alice 2.0 is that students can record videos of their animations for later viewing and/or posting to a web site. See Appendix A, Section A.3: Exporting your movies for QuickTime Videos & WebPages.

There are a number of good books that teach Alice programming in the standard way. Interested students may wish to further their learning through them. A web and library search will turn up quite a few books. Some of these books teach how to transition from Alice into Java.

Finally, at the end of each Workbook chapter is a summary that is a bit different from the type that you and your students might be used to. There, we relate the Workbook chapter contents to aspects of Snyder's *Fluency with Information Technology: Skills, Concepts, and Capabilities, e4*. Feel free to leverage what the students learn in the Workbook with what they are studying in the Snyder *Fluency* book, and visa versa.

As authors, we always appreciate your comments, corrections, innovative exercises, and ideas about the Workbook. Please feel free to share them with us at: AliceFluencyWorkbook@snhu.edu. This goes for your students, as well.

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