

# The Deduction Engine: Adapting the Holmesian Method into a Computer Game

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## Extended Abstract

### Introduction

The purpose of the paper is to propose an innovative method for adapting the Holmesian method of deduction into a video game. When reading or watching Sherlock Holmes stories, and other similar fiction, the reader or viewer follows passively along with Holmes' deductive process. In an interactive computer game, however, where the player is the detective, the player must actively detect themselves. But, how to design a game that allows for the player to follow the Holmesian method?

The game and game design proposed in the paper is an attempt to provide an entertaining adventure, but with a serious purpose. The proposed game would stimulate in the player critical thinking and logic skills and help a player gain new knowledge relevant to the crime being investigated. The design of the game draws upon relevant scholarly literature in adaptation and philosophy of logic to offer an innovative technique for implementing a Holmesian detection engine.

The game (or interactive fiction) is in an early stage of development, but a part of the game is playable and enough of the deduction engine concepts are developed to be able to discuss and evaluate progress so far. The part of the game completed serves as a test, a proof of concept.

### Adaptation Literature

The present game design discussed in the paper is framed as an adaptation problem. *Adaptation* is the study of how stories change when moving from one medium to another. For example, how were the Holmesian stories changed when they were moved into the recent action movies starring Robert Downey, Jr. or when they were moved into the modern day in the BBC series, *Sherlock*? How and why are they changed? Most of the past adaptation literature focused on the adaptation of novels to film. However, more recently there has been some attention put to other types of adaptations (e.g., novels to video games or video games to film) (Hutcheon, 2006; Leitch, 2009).

The paper and game is an attempt, in part, to add to this area of study. How do stories change when moving from the more passive novel or film to the interactive video game? When adapting into a video game, some parts of the process are easier than others. It is relatively easy to move names and descriptions of characters and locations, but how do you simulate the actions and thought processes of the characters in an interactive environment?

The paper includes discussion of the general adaptation literature and relevant video game related adaptations concepts including Hutcheon's *heterocosm* (2006).

## Holmesian Method

While the Holmesian method of detection an integral, perhaps the most important, part of the stories, relatively little is written about it. The paper includes discussion of Arthur Conan Doyle's description of the Holmesian method along with other descriptions of the methods. The author of the Sherlock stories, Doyle, does give it some attention within the stories. In the stories Sherlock speaks of his "science of deduction" and the two key components: observation and deduction. He often reminds his colleague, Dr. Watson, and the reader of the power of the method. Early in the four novels and 56 short stories, Watson is surprised by how, on their first meeting, Holmes knew Watson was an army doctor just back from Afghanistan. Watson thinks Holmes was told, but Holmes explains:

Nothing of the sort. I knew you came from Afghanistan. From long habit the train of thoughts ran so swiftly through my mind that I arrived at the conclusion without being conscious of intermediate steps. There were such steps, however. The train of reasoning ran, 'Here is a gentleman of a medical type, but with the air of a military man. Clearly an army doctor, then. He has just come from the tropics, for his face is dark, and that is not the natural tint of his skin, for his wrists are fair. He has undergone hardship and sickness, as his haggard face says clearly. His left arm has been injured. He holds it in a stiff and unnatural manner. Where in the tropics could an English army doctor have seen much hardship and got his arm wounded? Clearly in Afghanistan.' The whole train of thought did not occupy a second. I then remarked that you came from Afghanistan, and you were astonished. (Doyle, 1887)

It is this series of deductions, this train of thought, that needs to be simulated when moving Holmes into a video game. From what is presented by Doyle, the character-player needs to be able to observe and deduce. However, as Bayard (2007) notes, there is a middle step. The character-player needs to be able to observe things in the environment, and then find meaning in the clues based on a specialized knowledge and then, from there, deduce the facts of the case. The vast and specialized knowledge that Holmes has makes the process work in a novel or film, but not so much in an interactive video game. In a video game, it is relatively easy to have a player observe or examine something, but the player will most likely not have the specialized knowledge needed to make sense of what they observe. That is a key difficulty when adapting Holmes to a video game.

## Abductive Reasoning

While the scholarly study of the Holmesian method is limited, one key source, *The Sign of Three*, edited by Eco and Sebeok (1983), stands out. The paper focuses on this key source, but does include discussion of other relevant work, as well. *The Sign of Three*, using the work of logician Charles Peirce, provides an in-depth of study of Holmes' science of deduction. One key point made in the book is that what Holmes is doing is not deduction, but what Peirce calls abduction. Peirce identified three key logical processes: deduction, induction and abduction.

As a means of explaining the distinction among deduction, induction and abduction, Pierce (1878) put forth the beanbag examples:

Deduction

Rule: All the beans from this bag are white.

Case: These beans are from this bag.

Therefore, Result: These beans are white.

Induction

Case: These beans are from this bag.

Result: These beans are white.

Therefore, Rule: All the beans from this bag are white.

Abduction

Rule: All the beans from this bag are white.

Result: These beans are white.

Therefore, Case: These beans are from this bag.

With the above formulation, deductions follow logically from the rule and the case and would be necessarily be true, while abduction is a form of a best guess inference. A person may know the rule that all beans from a certain bag are white and then seeing some white beans near the bag assume that the beans came from the bag, but it may be that the beans came from some other source. It is a good, best guess, a reasonable assumption. In the case of Holmes' conclusions about Watson, Holmes starts with some rules from his vast knowledge, makes observations ("results"), then infers a good, best guess, Watson just returned from Afghanistan.

Holmesian Video Games

The paper includes analysis of past and current Sherlock Holmes video games and a few similar games from the *CSI* and *NCIS* series. One of the earliest Holmesian computer games was a text-based adventure from the early 1980s called simply *Sherlock*. In the late 1980s and early 1990s ICOM released a group of Holmes games, most notably the *Consulting Detective* series which included with full-motion video. Over the last decade, Frogwares has released several games available on a variety of gaming platforms (PC, DS, X360, etc.). Frogwares will soon release their newest Holmesian games, *The Testament of Sherlock Holmes*. The relevant video games range from hidden-object puzzle games to more complex games with what is called "deduction boards." Frogwares 2010 *Sherlock Holmes and the Hound of the Baskervilles*, for example, is primarily a hidden-object puzzle game. The "deduction board" games allow players to explore an environment and gather clues or evidence. The games then guide the player step-by-step through the process of coming to the proper conclusion about who committed the crime. The clues and conclusions are shown on the screen on the deduction board, a visual representation of the reasoning process.

## The Game

The game discussed in the paper was developed using Inform 7, an interactive fiction programming language and environment (Reed, 2007). Interactive fiction (IF) is “a computer-based form of interactive storytelling that uses text to describe a story world, which a player explores by entering imperative commands [e.g. look, take]” (Reed, 2007). Text-based IF was the first form of computer games, a precursor to the *video game*. The paper discusses the relevant aspects of Inform 7 and also the relevant history of interactive fiction (Montfort, 2005).

The game designed in conjunction with the paper is a web-based game or interactive fiction which integrates web searches into the game play to supplement the knowledge of the player. As mentioned previously, the specialized knowledge that the player probably does not have is the key difficulty when adapting Holmes to a video game. The game also takes a more open approach to allowing the player form their conclusions about what they observe instead of the more closed, step-by-step guiding done in most of the “deduction-board” games.

## Conclusion

The paper concludes with a summary and evaluation of the game including discussion of how the game stimulates critical thinking and logic skills and helps a player gain new knowledge. Limitations of the game and game design, featuring web searches and a more open reasoning process, is discussed with some suggestions for future research and game design.

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