

ACTSim: A Composition Tool for Authoring Adaptive Online Soft Skill Simulations

1. INTRODUCTION

Online training simulations are a very effective and efficient method of instruction [1]. They bridge the gap between theory and practice by providing a safe and convenient environment for learners to practice the skills they are being taught. Online simulations can however become rather repetitive and flat as the learner is presented with the same identical content through each iteration of the simulation. One solution to this problem is the use of adaptivity to provide more engaging experiences for the learner. The introduction of adaptivity not only creates a more interesting simulation for the learner but more importantly improves the educational effectiveness of the simulation. The key impediment with integrating adaptive online simulations into educational programs is the complexity and cost involved in their composition [2]. This paper presents ACTSim, a unique composition tool which incorporates a new approach to authoring adaptive online simulations.

This research is particularly focused on soft skill simulations [3]. These are simulations which teach skills based on interpersonal relationships such as interviewing, sales or telecommunications skills. These simulations typically consist of a series of interconnected video clips through which a learner navigates using hyperlinks.

2. APPROACH TO ADAPTIVITY

The first step in the design of ACTSim was to examine existing applications used to author adaptive soft skill simulations. Although an extensive search was completed no composition tools with these specifications were located. While some software companies do incorporate adaptivity in their online simulations they not supply composition tools for their development but author the simulations in-house. The adaptive simulations that are available typically combine the simulation content and adaptivity so the two are hard coded together. This results in adaptivity which is inextensible and content which is difficult to reuse. The manner in which adaptivity is incorporated also tends to be rather unsophisticated as it is often based on broadly categorising learners into predetermined skill or experience levels. The new and unique approach developed in this research and incorporated into the ACTSim composition tool is to separate the content and adaptivity of the simulation. This allows the adaptivity to be altered and the content to be reused. This innovative approach also supports an intuitive composition methodology for authors as content becomes less complex to manage. Content is initially developed and adaptivity is placed across the content insuring the two remain separate.

3. ACTSim DESIGN

As no adaptive soft skill simulation composition tools could be located for a state of the art survey the search was broadened to examine standard soft skill simulation composition tools. Through a detailed analysis of the different classes of composition tools there were several key composition requirements identified,

these included dialogue representation, complexity, and scalability along with adaptivity [4].

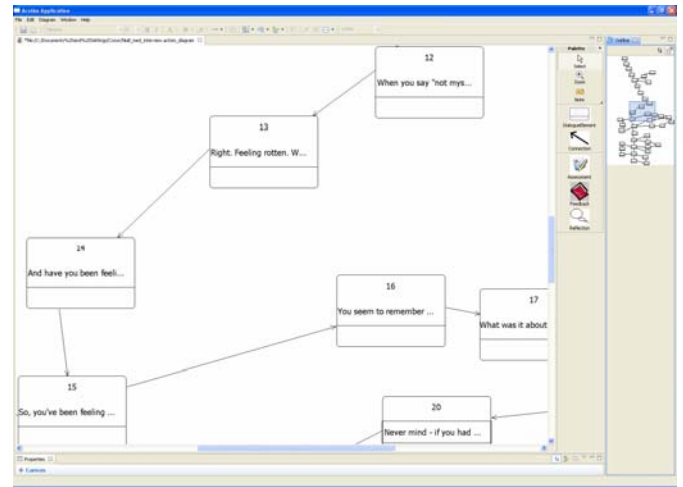


Figure 1: ACTSim Composition Tool

Soft skill simulations operate upon the dialogue which occurs within the simulation. The development of these dialogue models and the manner in which they are represented is central to authoring soft skill simulations. The most appropriate approach to dialogue representation was identified as a graph representation. This involves the dialogue being decomposed into smaller components (nodes) which are connected with arrows (edges) to form a graph, as seen in Figure 1. Each node represents a short video clip that the learner is presented in the simulation and the edges represent the hyperlinks that the learner can choose from within the simulation. This approach to dialogue representation benefits the author by allowing them intuitively create and connect the different elements of the dialogue. It does however require an authoring process to alleviate the complexity of composing the simulations. This authoring process not only needs a methodology for creating the models but also incorporated a pedagogical frame work so support educationally sound simulations. Further to an authoring process, navigational aids were also required by the composition tool to assist the author moving across the dialogue model. These are particularly useful if the simulation becomes large and complex. Navigational aids include a map of the dialogue model, zoom functionality and an arrange feature.

The final requirement to be incorporated into the ACTSim composition tool is adaptivity. The primary goal of adaptivity is to create a more effective educational experience. This is accomplished in two ways. The first of these is to produce a personalised dialogue for each of the learners. This is achieved by generating a dialogue from the dialogue composed by the author so it is relevant to the authors needs. This could be based upon the role the learner takes on within the simulation, certain relevant subjects that they are required to be taught or learning outcomes they are to achieve.

The second approach to creating an adapted learning experience for the learner was to include teaching principals such as assessment, feedback and reflection. These differ from the previous type of adaptivity as they are adaptive triggered events that occur within the simulation based on actions that learner takes within the simulation.

4. EVALUATION AND RESULTS

As ACTSim is a user based application an iterative process of design, implementation and evaluation is particularly important. The goal of the initial evaluation was to examine the requirements for authoring standard soft skill simulations. The results for this were evaluation were very positive with authors describing the composition tool as “*intuitive*” and “*user friendly*”. With another iteration of design and implementation completed the next evaluation will examine adaptivity. A preliminary study for this evaluation is presently underway and is the full evaluation is scheduled to be finished this month.

5. REFERENCES

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