Alice
The 3D Object-Oriented Programming Environment

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What is Alice?

- Alice is a freely available, innovative way of teaching OOP concepts to students through storytelling.
- The user acts like the director of movie in a 3D world, where all actions are controlled with object-oriented methods.
- The user can make the world interactive, with objects that respond to keyboard input or mouse clicks, or behave according to decision making logic or even randomly.
- The result is like a "visual program".
More About Alice

• Created at CMU by team lead by Randy Pausch.
• Written in java, graphics done with Java 3D API.
• Write programs with a “drag-and-drop” interface (you can’t make typos or forget semicolons)
• Lots of resources online to help teachers create courses based on Alice: textbooks, tutorials, teacher workshops, example worlds.
• About 15% of U.S. colleges have courses that integrates Alice into the course material.
• Open source (but you have to buy the textbook).
Who Uses Alice?

• Middle & high school students
• Entry level CS students (no programming experience)
• Experienced CS students
Why Use Alice?

• Introduces programming concepts in a non-technical, and fairly intuitive level. Middle school students know how to tell / direct a story, even if they’re not familiar with boolean logic.

• There are VERY basic tutorials that hold the user’s hand and walk them through using parts of the Alice IDE.

• Alice has a smooth learning curve, and is used by students ranging from middle school to college level.

• More appealing to female students than traditional CS introduction. (publications and testimonials suggest so)
Know Your Audience…

Notes taken during an observation session of 90 students at a public school in Lynchburg, VA:

“Of the people who reported that ‘Destroy’ was their least favorite part of the experience, 75% of the respondents were female, all of whom mentioned that the destruction sounds were extremely violent sounding, which was made all the more disturbing by the fact that the operation was carried out on a small, pink bunny rabbit.

In reaction to this, I have developed a somewhat friendlier, less chilling destruction protocol that scales objects down to 0.0, makes a whimsical poofing sound and replaces the object with a cloud.

This new protocol has not been tested yet, but I have high hopes that it will be received well by both males and females.”
The Alice IDE

- World Window
- Object Tree
- Object Details area
- Editor area
- Events area
More Detailed Example
Moving Objects in the World
Alice’s Mission

• Get more young people interested in CS.  
  (visual interface appeals to kids)

• Make CS more appealing to women .  
  (story-telling vs. programming)

• Increase retention rate of college students entering CS.  
  (“At risk CS1 students average C grade, and 47% take CS2.  With Alice, at risk students average B grade, and 88% go on to CS2”)
Future of Alice

• Alice 3.0 (beta) allows user to manipulate world objects with actual java code. ("They’re forced to confront semicolons and braces")
• Better cross platform support.
• CMU is collaborating with Electronic Arts, who agreed to underwrite Alice 3.0
A Work in Progress

WARNING: Alice3 is not for the faint of heart.

Alice3 is currently under development. We are working very hard to make this dialog box obsolete. Thank you for your patience.
We welcome your feedback.

- resources: http://alice.kerai.com/
- bug reports: http://bugs.alice.org:3080/
- blog: http://blog.alice.org/
- community: http://www.alice.org/community/
Cool features

• Never need to find syntax errors.
• Allows users to progress from simple to advanced concepts such as recursion, although attempting to use recursion brings up an “are you sure?”
• No installation required, and Alice 2.0 fits on a 256MB USB key, so user can easily work with different computers.
• Emphasis on good support materials.
What’s Not to Like?

Alice introduces OOP concepts, but isn’t a complete OOP language (unless you use java).

- No Inheritance (not really)
- No polymorphism
- Limited by choices offered by IDE (can’t directly make a list of lists; only singletons)
- Drag-and-drop paradigm inhibits some tasks (like copy-paste, or deleting part of a line)
- Moving the camera in “add-objects” view…
What else isn’t to like?
Demo time!

• 1\textsuperscript{st} Demo: Moon-Mummy
  
  Script using multiple objects and showing some of the things they can do. Shows how objects and instructions are organized.

• 2\textsuperscript{nd} Demo: Whack-a-Mole!
  
  Interactive game with some more programming elements.
Resources

- http://www.alice.org/
- http://www.alice.org/community/
- http://www.aliceprogramming.net/
- http://www.java3d.org/

Storytelling Alice (for middle school)