

CompSci 4

Introduction to Programming

Animation and Virtual Worlds

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What is Computer Science?

- Computer science is no more about computers than astronomy is about telescopes. - Edsger Dijkstra



- Computer science is not as old as physics; it lags by a couple hundred years. However this does not mean that there is significantly less on the computer scientist's plate than on the physicist's: younger it may be, but it has had a far more intense upbringing! - Richard Feynman



Computer Science is a young discipline

- First computer science department formed in 1962



1962



Samuel D. Conte
Professor emeritus of computer science and mathematics was the founding department head of the nation's first computer science program. October 1962.

What is Computer Science?

- Artificial Intelligence



Mars Rover



Roomba



CMU's Sandstorm

What is Computer Science?

- Animation



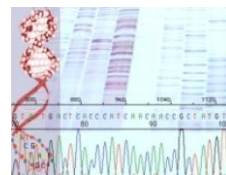
What is Computer Science?

- The Organization of Data, and Searching



What is Computer Science?

- Medicine, Genomics



What is Computer Science?

- Devices



Computer Science and Programming

- Computer Science is more than programming
 - Called *Informatics* in many countries
 - Elements of both science and engineering
 - Elements of math, physics, cognitive science, music, art, and many other fields
- To some programming is an art, to others a science, to others an engineering discipline.

What Will We Do in CompSci 4?

- Web pages/html (one week)
- Learn to program with Alice (mostly)
- Research study
- Java (2-3 weeks at the end)
- Logistics
 - Bring laptop or use class laptops
 - Textbook

How CompSci 4 Will Work

- In Class
 - Lecture/demos
 - Tutorials
 - Classwork (in pairs) (REQUIRED ATTENDANCE)
- Outside of class
 - Complete work not finished in class
 - Reading
 - Assignments

What Is Alice?



- A modern programming tool
 - 3-D graphics
 - 3-D models of objects
- Animation
 - Objects can be made to move around virtual world (a simulation or video game)

What does Alice run on?

- Alice is written in Java – should run on many systems
 - supports Mac and PC

Fast Start Up

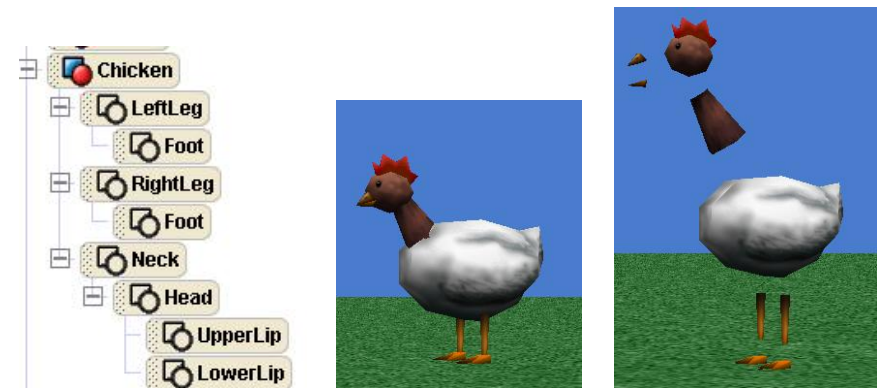
- Can quickly learn to create
 - A simple animation in a few minutes
 - A non-trivial animation in a few class periods
- Can learn to use the Alice interface after a few more class periods

The Power of Alice

- Automatically keeps track of 3-D objects
 - What objects are in the virtual world
 - Types of objects
 - Positions of objects in the world

Objects Have Multiple Parts that are moveable

- Objects already exist in libraries



Program an Object

The image shows a Scratch script editor window. At the top, a yellow bar contains a blue circle icon and the text "World.my first method". Below this, the text "World.my first method" is followed by "No parameters" in a lighter font. Underneath, it says "No variables". The main area contains a series of action blocks for a "Chicken" object. The first block is "Chicken.Neck.Head" with a "turn" action, "right" direction, and "0.25 revolutions". The second block is "Chicken" with a "move" action, "up" direction, and "0.5 meters". The third block is "Chicken.Neck.Head" with a "turn" action, "left" direction, and "0.25 revolutions". The fourth block is "Chicken" with a "roll" action, "right" direction, and "2 revolutions". Below these is a "Do together" block, which is a purple block with a small icon on the left. It contains two sub-blocks: "Chicken" with a "say" action, the text "CompSci 4 is going to be fun!", and a "duration" of "4 seconds"; and "Chicken" with a "move" action, "down" direction, and "0.5 meters". The final block is "Chicken" with a "move" action, "forward" direction, "10 meters", and a "style" of "abruptly". Each block has a "more..." button on the right.

Class Today

- Demo of Alice
 - Simple world
 - Projects from last semester
- Go over syllabus, web page
- A simple web page
- Assignment