


CSE 3302 Programming Languages




Object-Oriented Programming

Chengkai Li
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Why Study Smalltalk



- Purest OO language
- Pioneered in many things
 - Graphical user interface (Window, Menu, Mouse)
 - Personal workstation
 - Push OO into success
 - I invented the term Object-Oriented, and I can tell you I did not have C++ in mind. -- Alan Kay
- Has an active community
- Could have deserved more popularity

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Key Features



- Very simple syntax
- Everything is object
 - Integer like 3, true, nil
 - Class is object
 - no control: if, loop are objects
- Dynamically typed:
 - Variable has no type.
 - The class hierarchy is the type system.
- The language is together with its interactive runtime system
 - Runtime written in the language itself
 - Can change the system on-the-fly
 - Debug system state (image), object, class hierarchy
- All data is private (protected), all methods are public.
- No manual memory management and pointers

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History



- 1967: Inspired by Simula67, the first OO language
- 1971: Started by Dynabook project (Alan Kay)
 - Hardware: GUI, pointing device, external storage, etc.
 - Later led to Alto ("laptop")
 - Software: targeted at Children
 - Became Smalltalk
 - Education

Is Dynabook realized? Kay doesn't think so:

- Squeak
- One Laptop Per Child project (Nicholas Negroponte, Alan Kay, ...)
 - <http://www.xogiving.org/>



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History (cont.)



- 1973: Xerox Alto Computer
 - First Smalltalk environment
 - The ALTO Computer 1974 - Video
 - <http://www.maniacworld.com/alto-computer-video.html>
- 1972: Smalltalk-72
- 1976: Smalltalk-76
- 1980: Smalltalk-80
- Major contributors of Smalltalk:
 - Alan Kay (2003 Turing Award), Adele Goldberg, Daniel Ingalls, et. Al.

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Smalltalk Today



- Squeak
 - Seaside: a dynamic web application development framework
 - Croquet: an open source platform for collaborative 3D multi-user online applications.
 - Sophie: a digital media assembly tool to create multimedia documents.
 - Scratch: a toolkit for children to write games, animated stories.
- Cincom VisualWorks, IBM VisualAge, GNU Smalltalk, Dolphin,

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Resources



- Implementations:
squeak (<http://www.squeak.org/>)
Cincom VisualWorks
- Books, Tutorials:
<http://www.iam.unibe.ch/~ducasse/FreeBooks.html>
<http://squeak.preeminent.org/tut2007/html/>
<http://www.iam.unibe.ch/~scg/SBE/>
<http://wiki.squeak.org/squeak/377>

What we use in class



Squeak:

- Download at <http://www.squeak.org/>
- Quick Tutorial:
A Development Example for Squeak 3.9
<http://squeak.preeminent.org/tut2007/html/>
- A Free Book:
Squeak by Example
<http://www.iam.unibe.ch/~scg/SBE/>

Now Alan Kay Talks



- <http://video.google.com/videoplay?docid=-2950949730059754521>
- <http://video.google.com/videoplay?docid=-9055536763288165825>

More Squeak



- http://www.youtube.com/watch?v=y_3l08tI5wQ