Squeak and Croquet

- Please note:
  - The following are just screenshots from the demo made with Squeak
  - For the real experience: Download the demo image from: http://squeak-ev.de/21c3

Squeak and Croquet

Marcus Denker - denker@acm.org

full screen on

full screen off

Overview

Part I:

The Squeak Project

Part II:

Squeak for Kids (Small Hackers)

Squeak for older Hackers

Part III: Beyond Squeak: Croquet

Part I: The Squeak Project

- What is Squeak ?
  -> Examples

- History
  -> Alan Kay's Dynabook

What is Squeak?

1 Multimedia Authoring

2. Programming for Children

3. Operating System?

4. Development Environment

5. A Community

Computers, Networks and Education

Globally networked, easy-to-use computers can enhance learning, but only within an educational environment that encourages students to question "facts" and seek challenges

by Alan C. Kay

The physicist Murray Gell-Mann has remarked that education in the 20th century is like being taken to the world's greatest restaurant and being fed the menu. He meant that represent- ations of ideas have replaced the ideas themselves; students are taught super- ficially about great discoveries instead of being helped to learn deeply for them- selves.

In the near future, all the representations that human beings have invented will be instantly accessible anywhere in the world on intimate, notebook-size compu- ters. But will we be able to get from the menu to the food? Or will we no longer understand the difference between the two? Worse, will we lose even the ability to read the menu and be satisfied just to recognize that it is one?

There has always been confusion between carriers and contents. Pianists know that music is not in the piano. It begins inside human beings as special urges to commun- icate feelings. But many children are forced to "take piano" before their musical impulses develop; then they turn away from music for life. The piano at its best can only be an amplifier of existing feelings, bringing forth multiple notes in harmony and polyphony that the unaided voice cannot produce.

The computer is the greatest "piano" ever invented, for it is the master carrier of representations of every kind. Now there is a rush to have people, especially school- children, "take computer." Computers can amplify yearnings in ways even more profound than can musical instruments. But if teachers do not nourish the romance of learning and expressing, any external mandate for a new "literacy" becomes as much a crushing burden as being forced to perform Beethoven's sonatas while having no sense of their beauty. Instant access to the world's information will prob- ably have an effect opposite to what is hoped: students will become numb instead of enlightened.

In addition to the notion that the mere presence of computers will improve learning, several other misconceptions about learning often hinder modern education. Stronger ideas need to replace

STUDENTS at the Open School: Center for Individualization, in Los Angeles, are creating a dynamic simulation of ocean life (right) and doing math (above) with the help of Macintosh computers, which are set unobtrusively into the desks. In the Open School, which already had a strong curriculum before it obtained computers, the machines do not substitute for teachers. There are thought of as "just another material", like books, paints and clay, that can support the

ALAN C. KAY has been a Fellow of Apple Computer Inc. since 1984. Before joining Apple, he was a founder and fellow of the Xerox Palo Alto Research Center and, later, chief scientist of Atari. One of the pioneers of personal computing, he is the original designer of the overlapping-window user interface and Smalltalk, the first completely object-oriented language.

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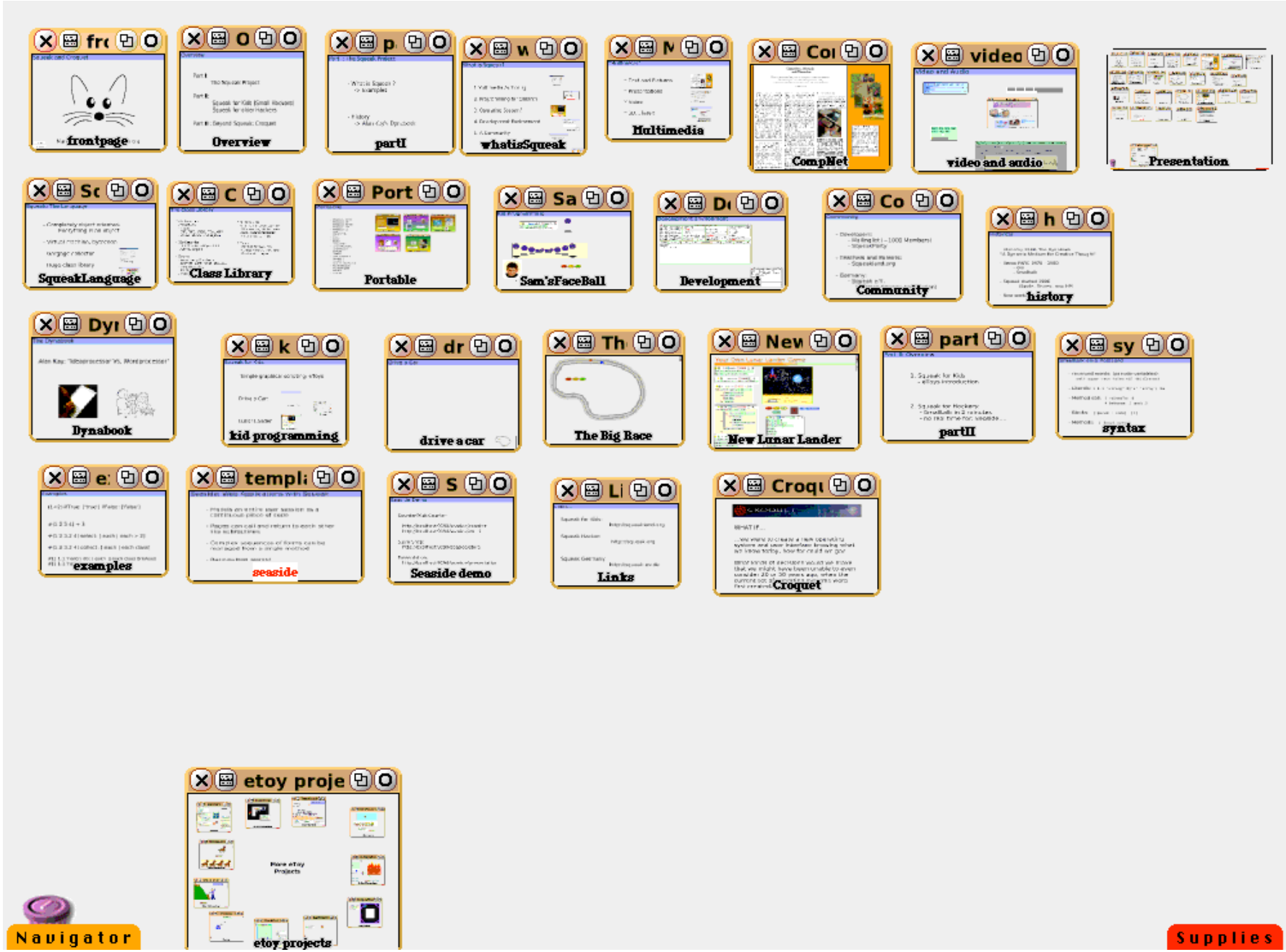
frontpage
Overview
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whatisSqueak
Multimedia
CompNet
video and audio
Presentation
SqueakLanguage
Class Library
Portable
Sam'sFaceBall
Development
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history
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kid programming
drive a car
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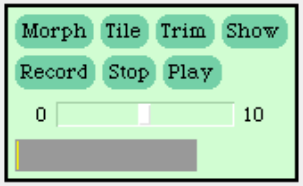
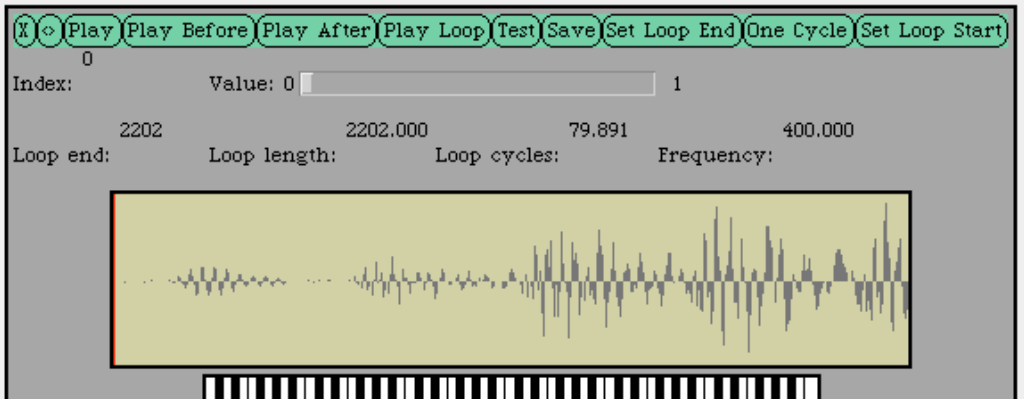
etoy projects
Navigator
Supplies

Video and Audio





Squeakers

A documentary film about Alan Kay, computers, and kids.

Dr. Alan Kay, known as "the Father of the Personal Computer," has devoted his life to the subject of computers and early childhood education. Thirty years of computer innovation and a deep understanding of how children learn is behind his Squeak programming language - and the new math and science projects shown here with fourth to sixth graders.

A 44-minute Hi Def film of interest to parents, educators, and anyone concerned about how children learn, SQUEAKERS features Alan Kay, Jerome Bruner, Seymour Papert, and a special appearance by Quincy Jones.

http:squeakersfilm.org

What is Squeak?

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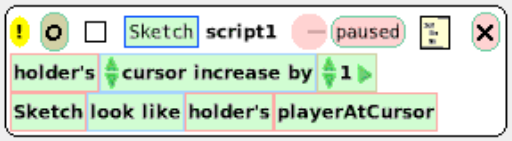
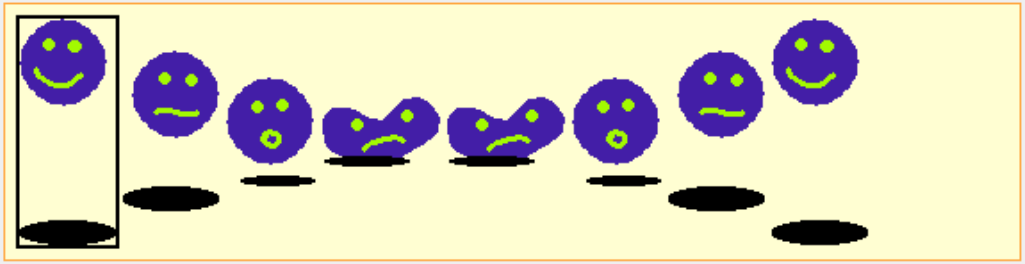
Kid Programming





Sam L.

What is Squeak?

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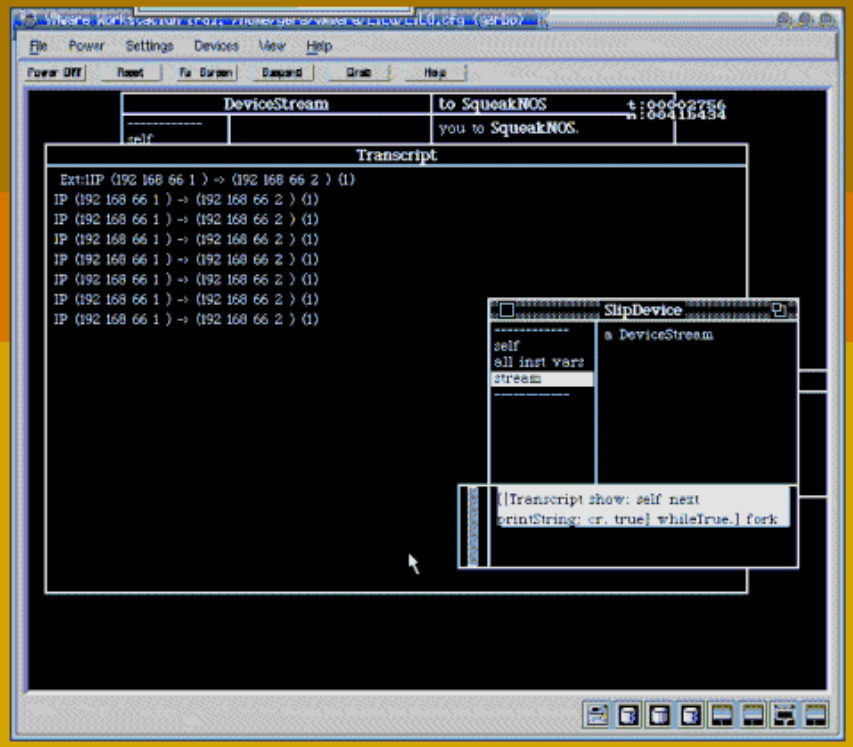
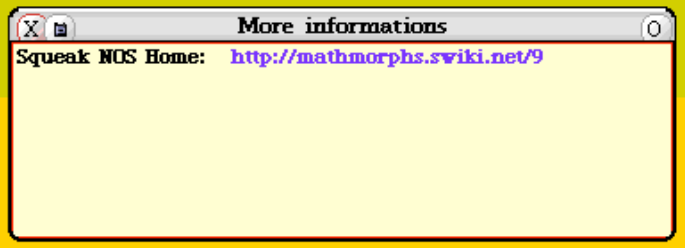
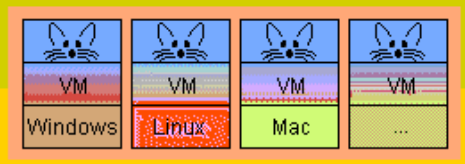
Squeak NOS

Squeak NOS (No operating system) project is trying to get rid of the OS under Squeak. All needed functionality is implemented in Smalltalk. The idea is to write a really tiny kernel to boot Squeak







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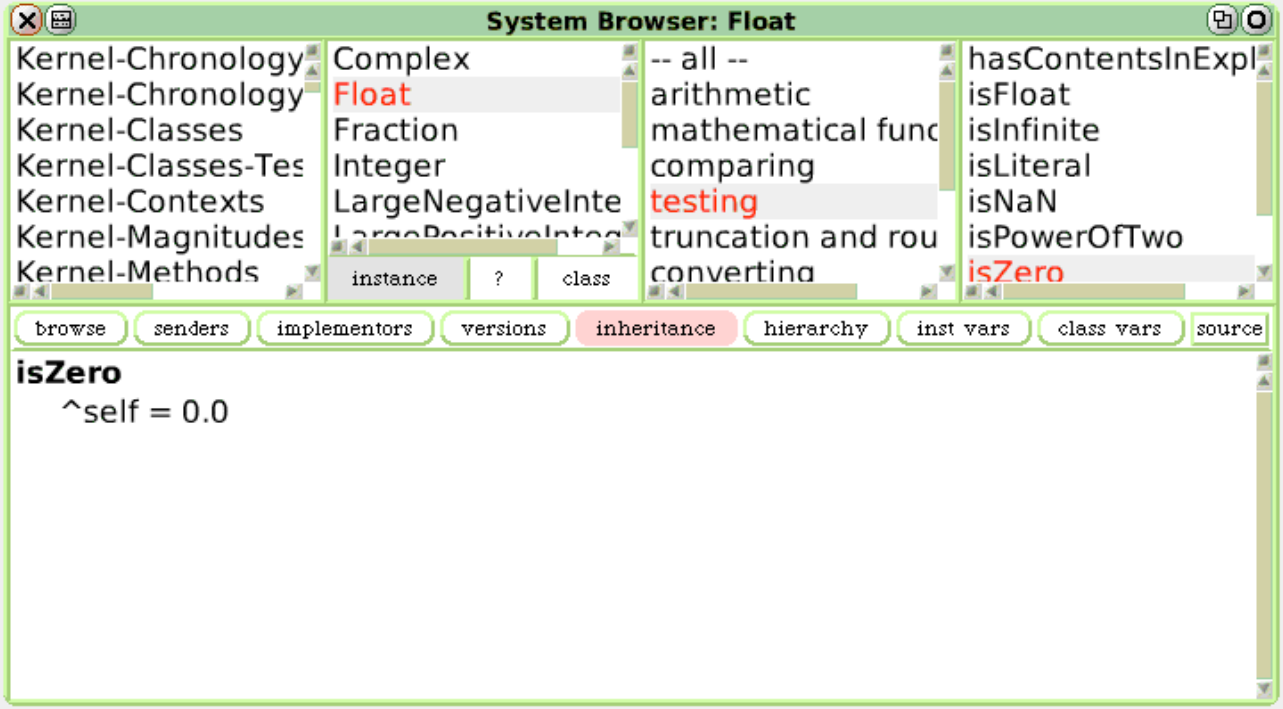
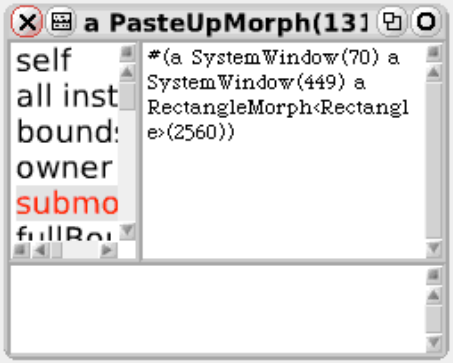
Development Environment





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Community

- Developers:
  - Mailinglist (~1000 Members)
  - SqueakParty
- Teachers and Parents:
  - Squeakland.org
- Germany:
  - Squeak e.V.
    (German Squeak Association)

Part I: The Squeak Project

- What is Squeak ?
  -> Examples

- History
  -> Alan Kay's Dynabook

Historical

- Alan Kay 1968: The Dynabook
"A Dynamic Medium for Creative Thought"

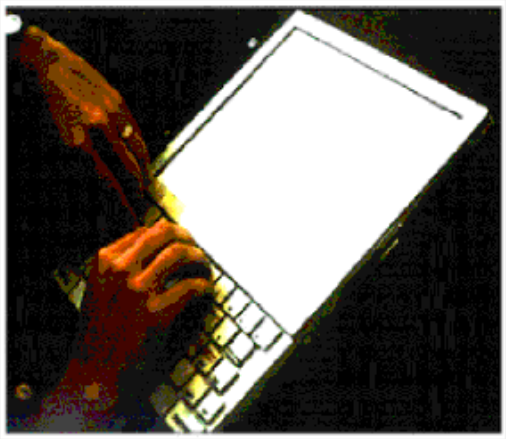
- Xerox PARC 1970 - 1980
    - GUI
    - Smalltalk

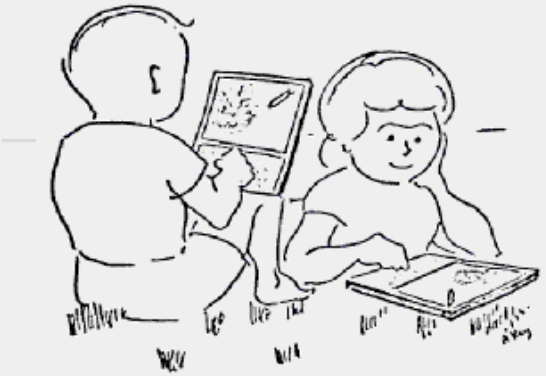
- Squeak started 1996
    (Apple, Disney, now HP)

- Now working on Croquet

The Dynabook

Alan Kay: "Ideaprocessor Vs. Wordprocessor"





Part II: Overview

1. Squeak for Kids
   - eToys introduction

2. Squeak for Hackers:
   - Smalltalk in 2 minutes
   - no real time for: Seaside....

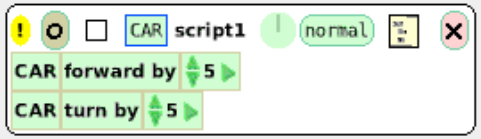
Squeak for Kids

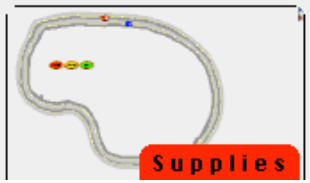
Simple graphical scripting: eToys

Drive a Car:

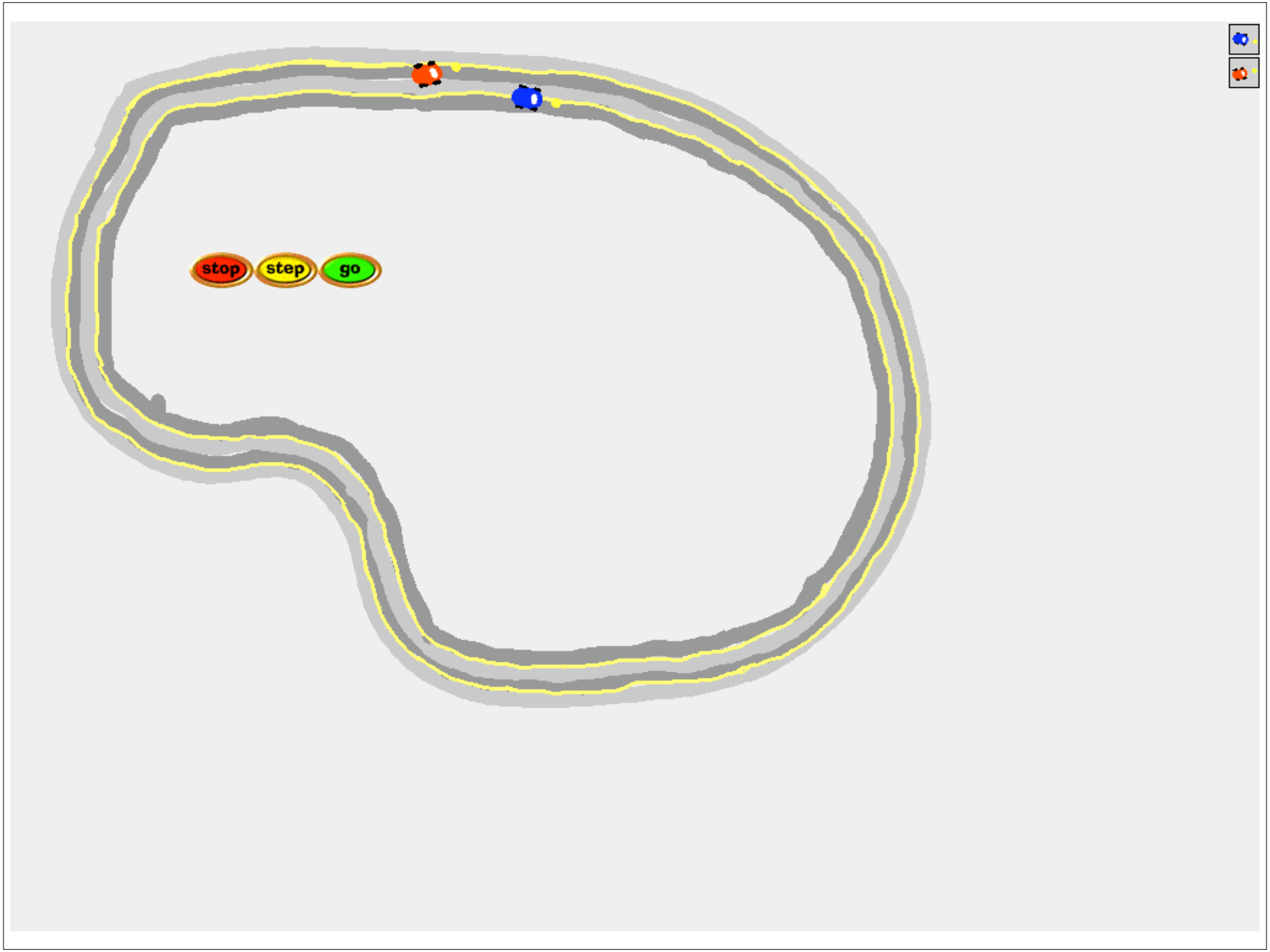
Lunar Lander

Drive a Car

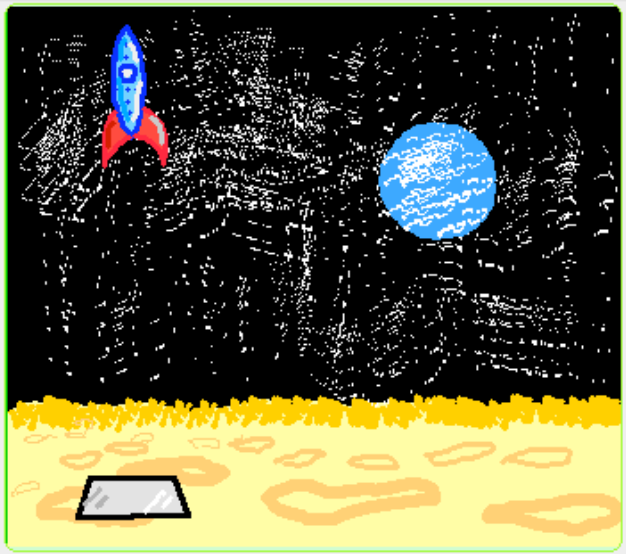




Navigator


stop
step
go

Your Own Lunar Lander Game



ship's ySpeed = 0.0

stop step go

ship reset

```
ship gravity paused
ship's ySpeed increase by -1
ship's y increase by ship's ySpeed
```

```
ship motor paused
ship's ySpeed increase by Joystick2's upDown
```

```
flame on paused
Test Joystick2's upDown > 0
  Yes flame's x ← ship's x
      flame's y ← ship's y
      flame show
  No  flame hide
```

```
ship land paused
Test ship's color sees color
  Yes Test ship's ySpeed > -8
        Yes flame hide
            ship hide
        No  ship make sound splash
            crash show
      ship allProcessespause
  No
```

```
ship allProcessespause normal
ship pause script gravity
ship pause script motor
ship pause script land
```

```
ship reset normal
ship's x ← 70
ship's y ← 260
ship's ySpeed ← 0
ship show
flame hide
crash hide
```

```
ship reveal normal
crash show
flame show
```

Squeak: The Language

- Completely object oriented:
  Everything is an object

- Virtual machine, bytecode

- Gargage collector

- Huge class library

  100 factorial

The Class Library

* 2D-Graphics
  - TrueType
  - Flash
  - GIF, PNG, JPEG, PCX, XBM
  - Video: MPEG und MJPEG

* 3D-Graphics
  - 3D-Graphics (OpenGL)
  - VRML import

* Sound:
  - Recording, Playback
  - ADPCM, AIFF, GSM, MuLaw,
  - MP3 decoding
  - FM-Synthesis
  - MIDI

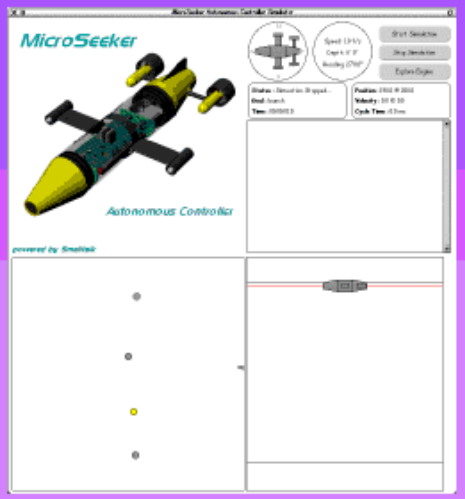
* Networking:
  - HTTP, FTP, POP, SMTP
  - Mailreader, Webserver
  - Groupware-features:
  - Chat (voice, text)

* Misc:
  - Digital Signatures
  - Compression: ZIP, gzip
  - Postscript export

Portable

- Windows 2000
- Windows NT
- Windows 95/98
- Windows XP
- Windows CE
- DOS
- Macintosh
- OS/2
- Acorn
- BeOS
- Linux/i386
- Linux/PowerPC
- Linux/Sparc
- SunOS
- Solaris
- SCO System V
- MacOS 9
- MacOS X
- DigitalUnix/Alpha
- NetBSD/Sparc
- NetBSD/i386
- Psion 5
- Zaurus

Autonomous Controller for Microseeker built with Squeak



More informations

HUV is a small, privately-owned research & development company that focuses on very small autonomous underwater vehicles (AUVs), and the software that runs them.

HUV is currently involved in the design and construction of MicroSeeker, a simple, small, proof-of-concept AUV. There are two distinct systems in MicroSeeker. The first is the low-level, real-time data acquisition and control system. This is run by a network of PIC microcontrollers that run PIC/Smalltalk. The second is the high-level autonomous control system. That level will be running on a PDA device called a Helio, and it will be written in Squeak.
There is also a simulator written in Squeak.

More Infos: **http://www.huv.com/**

Smalltalk on a Postcard

- reserved words: (pseudo-variables):

```
self super true false nil thisContext
```

- Literals: `1 1.1 'string' #('a' 'array') $a`

- Method call:

```
3 raisedTo: 4
4 between: 3 and: 5
```

- Blocks: `[:param | code]  [1]`

- Methods:

```
| local vars |
^return
```

Examples

```
(1<2) ifTrue: ['true'] ifFalse: ['false']


#(1 2 3 4) + 3

#(1 2 3.2 4) select: [:each | each > 2]

#(1 2 3.2 4) collect: [:each | each class]

#(1 1.1 'hallo') do: [:each  | each class browse]
#(1 1.1 'hallo')
```

Seaside: Web Applications with Squeak

- Models an entire user session as a continuous piece of code

- Pages can call and return to each other like subroutines

- Complex sequences of forms can be managed from a single method

- Back-button works!

Seaside Demo

Counter/MultiCounter:

http://localhost:9090/seaside/counter
http://localhost:9090/seaside/multi

Sushi Shop:
http://localhost:9090/seaside/store

Presentation:
http://localhost:9090/seaside/presentation

Links....

Squeak for Kids:

http://squeakland.org

Squeak Hacker:

http://squeak.org

Squeak Germany:

http://squeak-ev.de

WHAT IF...

...we were to create a new operating system and user interface knowing what we know today, how far could we go?

What kinds of decisions would we make that we might have been unable to even consider 20 or 30 years ago, when the current set of operating systems were first created?