

# Python In Education Potpourri

Wesley J. Chun  
wescpy@gmail.com & @wescpy  
<http://cyberwebconsulting.com>  
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## Speaker Teaching Background

- Came to Python in 1997 from C, Unix, networking, etc.
- Teaching since 1983
  - 1983, 1988-1991
    - Taught BASIC programming (children ages 6-18)
  - 1993-1998
    - Taught UNIX and C programming (professionals)
  - 1998-present
    - Teaching Python programming (professionals)
- Past/present faculty of Univ. of California, Foothill College
- Corporate training for Google, Cisco, Hitachi, VMware, etc.

# Python in Education

- Low barrier of entry
  - Simple yet robust syntax
    - Some say Python easier than VB; opposite of Perl
    - Less complex & fewer lines of code than C++ & Java
    - Yet still as powerful as C++ & Java
  - Does not require Computer Science major to use
  - Extremely rapid prototyping and development
  - Code: easy-to-learn, easy-to-read, easy-to-maintain
- What levels should Python be employed?
  - 4 main languages used to teach children programming

## Real world vs. Teaching children programming

### What are programming languages?

Various dialects that let humans give instructions to computers



- Some are easier than others
- Some are special-purpose
- Adults: Java, C/C++, Python, Ruby, PHP
- Kids: Scratch, Alice, Python, BASIC



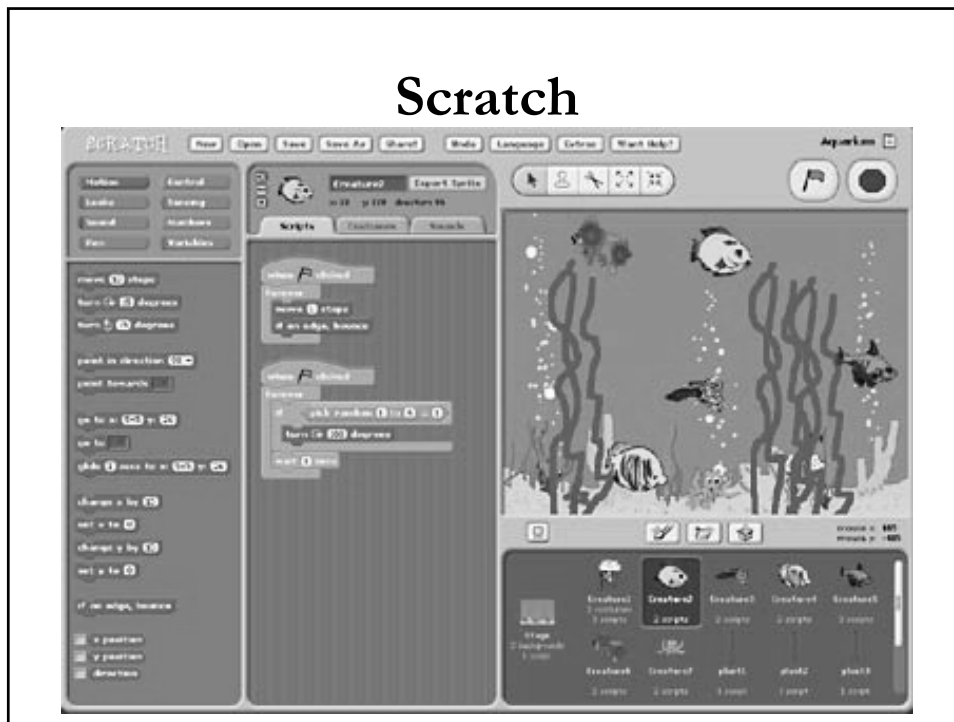
## Python suitable as 2nd language

- University level: definitely
- Secondary (ages 15-18): very good choice
- Primary (ages 6-14) level: good choice but other options
- Young Children
  - Python suitable as 1st or (better as) 2nd language
  - Scratch (MIT)
    - <http://scratch.mit.edu>
  - Alice (CMU)
    - <http://alice.org>
  - VB: no!

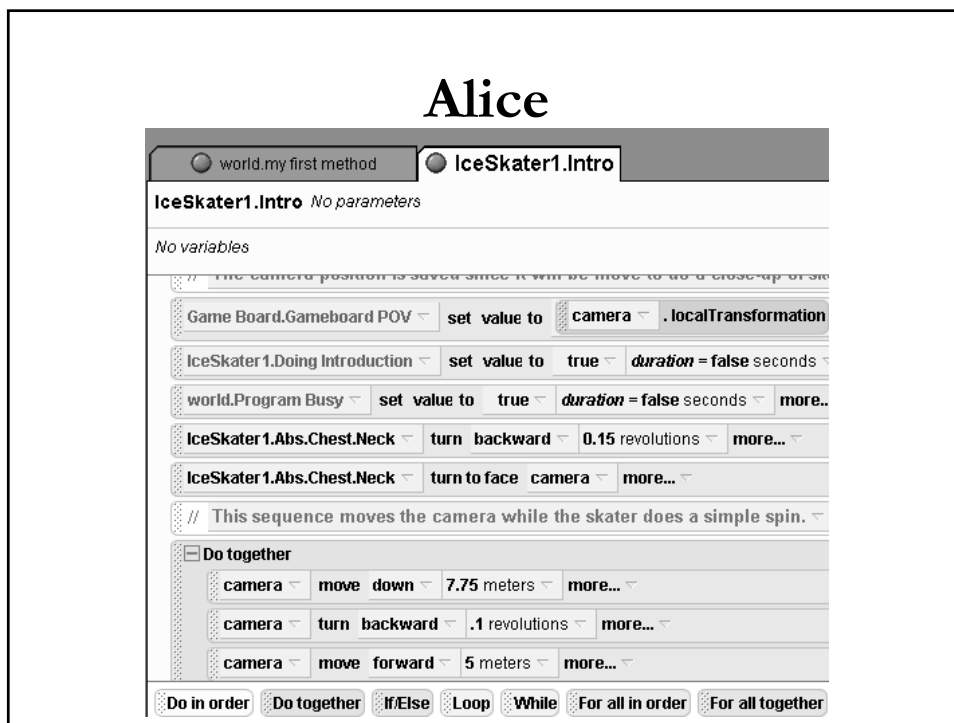
## Scratch



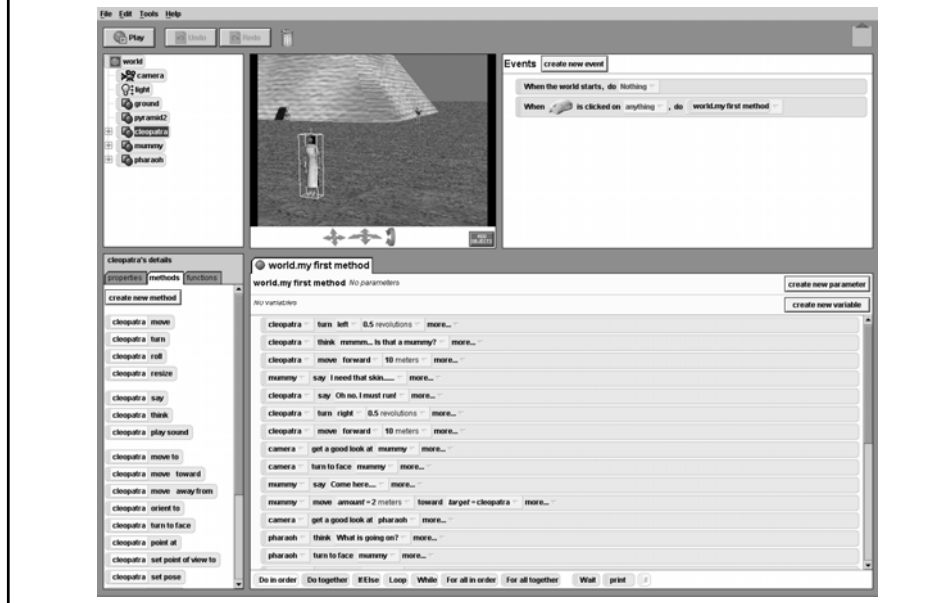
# Scratch



# Alice



# Alice



## MIT: Scheme to Python (2006)

- One of the most prestigious universities in the world
- First undergraduate series of CS courses
  - Switched from Scheme to Python around 2006
- Greater flexibility, better CS/EE dept integration, and better prepare students for graduate school or real-world
- Starting off with python makes an undergraduate's initial experiences maximally productive in the current environment
- <http://lambda-the-ultimate.org/node/1840>
- <http://danweinreb.org/blog/why-did-mit-switch-from-scheme-to-python>
- <http://muckandbrass.com/web/x/zAAq>
- <http://tech.mit.edu/V125/N65/coursevi.html>
- [http://www.mitadmissions.org/topics/learning/coursework/the\\_end\\_of\\_an\\_era\\_1.shtml](http://www.mitadmissions.org/topics/learning/coursework/the_end_of_an_era_1.shtml)

## PyCon/IPC Talks

- Jeff Elkner
  - Using Python in a High School Computer Science Program
  - <http://www.python.org/workshops/2000-01/proceedings/papers/elkner/pyYHS.html>
  - <http://www.elkner.net/jeff/pyYHS/year02/pyYHS2.html>
- Vern Ceder
  - Teaching Programming with Python and PyGame
  - <http://tech.canterburyschool.org/pycon/>

## Published Books for Children & Adults

- Hello World! Computer Programming for Kids & Other Beginners
  - Warren Sande & Carter Sande, 2009
  - <http://cp4k.blogspot.com>
- Python Programming for the Absolute Beginner
  - Michael Dawson, 2010 (3e)
- Learning with Python: How to Think Like a Computer Scientist
  - Allen Downey, Jeff Elkner, Meyers, 2002 (1e), 2010? (2e)
  - <http://openbookproject.net/thinkcs/python2e.php>

## **Published Books for University Students**

- Python Programming: An Intro to Computer Science (Zelle, 2003)
  - <http://mcs.wartburg.edu/zelle/python/>
- Intro to Computing and Programming in Python (Guzdial, 2004)
  - <http://phptr.com/title/0136060234>
- Core Python Programming (Chun, 2007)
  - <http://corepython.com>

## **Online books, tutorials, environments, etc.**

- How to Think Like a Computer Scientist (Downey, Elkner, Meyers)
- Learning to Program (Gauld)
- LiveWires Python course
- A Byte of Python (Swaroop)
- Instant Hacking: Learning to Program with Python (Hetland)
- Snake Wrangling for Kids (Briggs)
- Computer Programming is Fun! (Handy)
- Karel the Robot clones: Guido van Robot, RUR-PLE

## Diversity Conferences

- Grace Murray Hopper
  - Designed to bring the research & career interests of women in computing to the forefront
- Dare 2B Digital
  - Addressing the gender gap in careers in Computer Science
  - Young girls, ages 13-16
  - I delivered several 75-minute sessions there
    - <http://prezi.com/rtydlhz4ulls>
  - Excited, some issues, but in general satisfactory

## Diversity Organizations

- Girls In Tech
  - <http://girlsintech.net>
- Anita Borg Institute
  - <http://anitaborg.org/>
- Techbridge
  - <http://www.techbridgegirls.org/>
- GirlStart
  - <http://girlstart.org>
- International
  - <http://www.scwist.ca/>
  - <http://www.ukrc4setwomen.org/>
  - <http://www.witec-eu.net/>



## **Google Anita Borg Memorial Scholarship**

- Asia Pacific
  - <http://www.google.com/anitaborg/apac/>
- \$3500USD (~S\$4950)
- Invitation to Google's Engineering Center in Korea
- Female student enrolled in full-time university
  - kr, jp, sg, th, my, id, ph, vn
  - Studying CS, Software Eng, or a similar technical field
  - Maintain an excellent academic record

**FINIS**