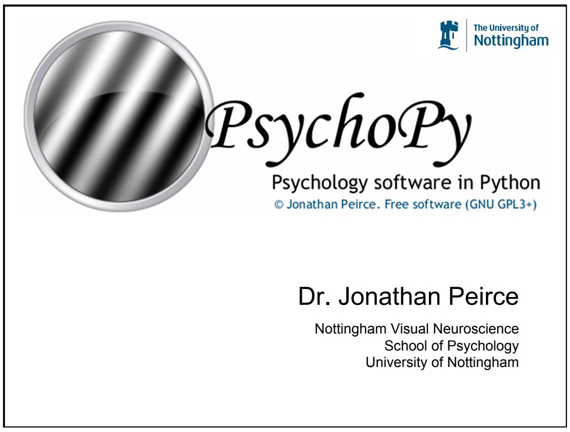

PsychoPy

Psychology software in Python

© Jonathan Peirce. Free software (GNU GPL3+)

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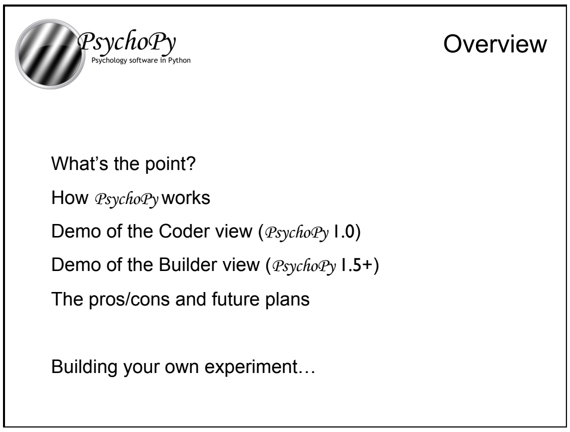
School of Psychology
University of Nottingham



PsychoPy
Psychology software in Python

Overview

What's the point?

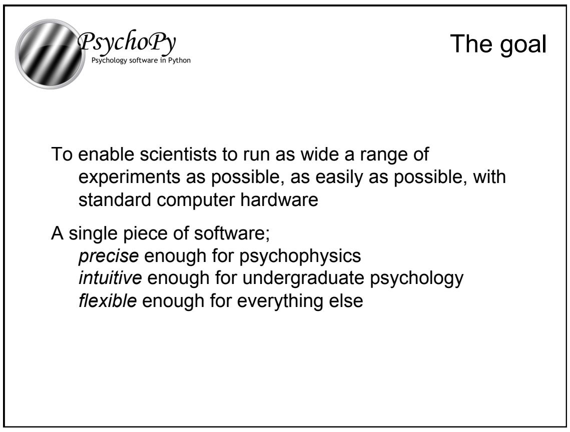
How PsychoPy works

Demo of the Coder view (PsychoPy 1.0)

Demo of the Builder view (PsychoPy 1.5+)

The pros/cons and future plans

Building your own experiment…

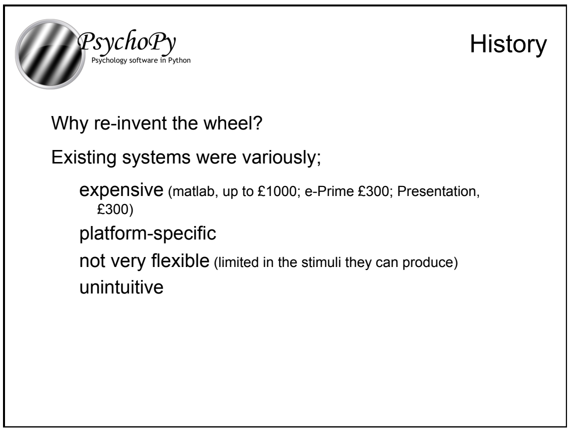


PsychoPy
Psychology software in Python

The goal

To enable scientists to run as wide a range of experiments as possible, as easily as possible, with standard computer hardware

A single piece of software;
- *precise* enough for psychophysics
- *intuitive* enough for undergraduate psychology
- *flexible* enough for everything else

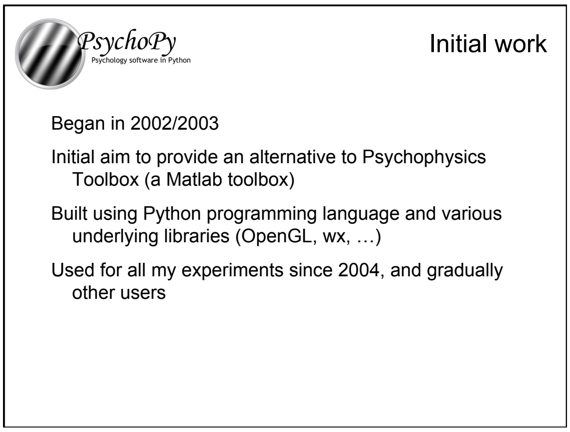


PsychoPy
Psychology software in Python

History

Why re-invent the wheel?

Existing systems were variously;
- expensive (matlab, up to £1000; e-Prime £300; Presentation, £300)
- platform-specific
- not very flexible (limited in the stimuli they can produce)
- unintuitive



PsychoPy
Psychology software in Python

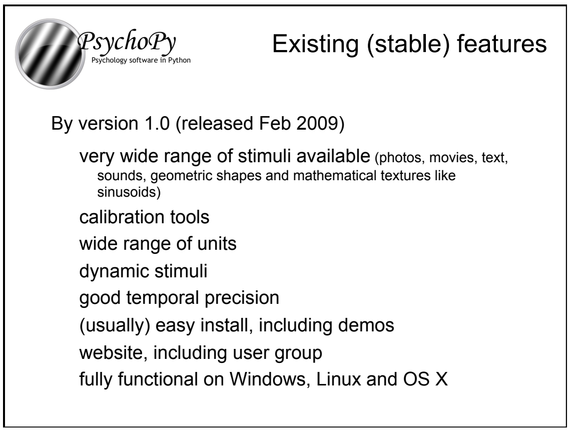
Initial work

Began in 2002/2003

Initial aim to provide an alternative to Psychophysics Toolbox (a Matlab toolbox)

Built using Python programming language and various underlying libraries (OpenGL, wx, …)

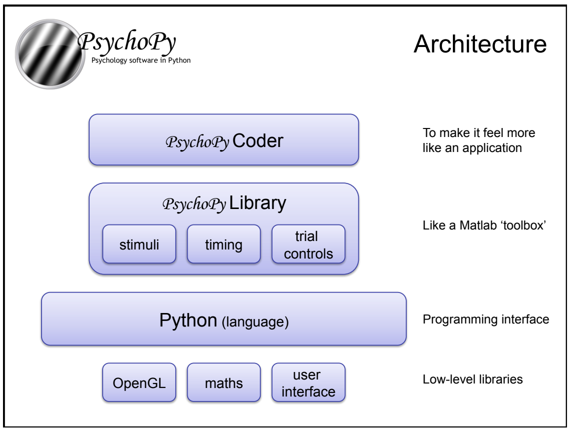
Used for all my experiments since 2004, and gradually other users



PsychoPy
Psychology software in Python

Existing (stable) features

By version 1.0 (released Feb 2009)
- very wide range of stimuli available (photos, movies, text, sounds, geometric shapes and mathematical textures like sinusoids)
- calibration tools
- wide range of units
- dynamic stimuli
- good temporal precision
- (usually) easy install, including demos
- website, including user group
- fully functional on Windows, Linux and OS X



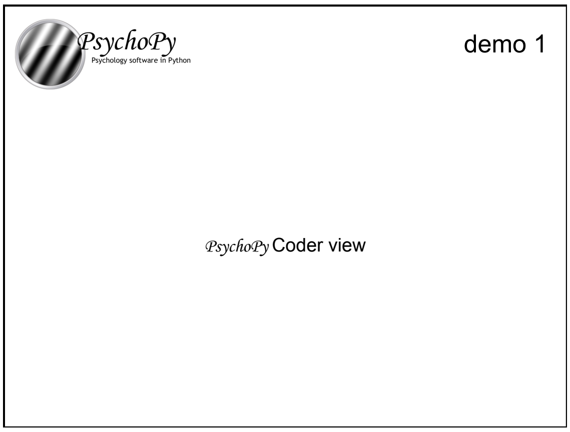
Architecture

PsychoPy Coder — To make it feel more like an application

PsychoPy Library: stimuli, timing, trial controls — Like a Matlab 'toolbox'

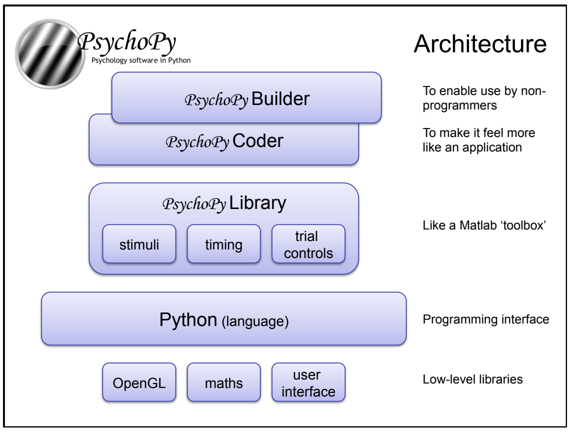
Python (language) — Programming interface

OpenGL, maths, user interface — Low-level libraries



demo 1

PsychoPy Coder view



Architecture

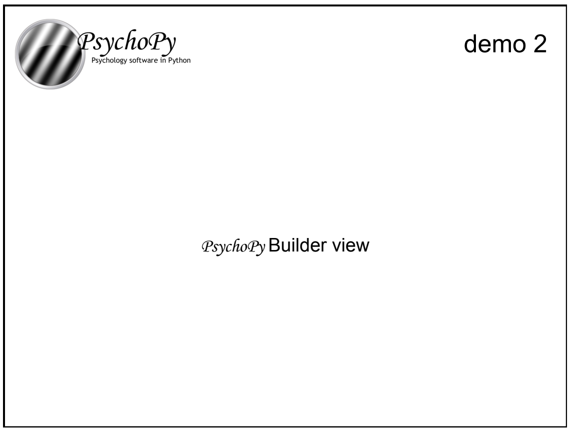
PsychoPy Builder — To enable use by non-programmers

PsychoPy Coder — To make it feel more like an application

PsychoPy Library: stimuli, timing, trial controls — Like a Matlab 'toolbox'

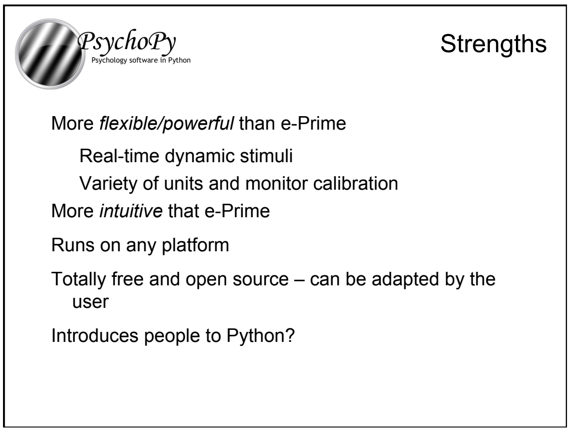
Python (language) — Programming interface

OpenGL, maths, user interface — Low-level libraries



demo 2

PsychoPy Builder view



Strengths

More *flexible/powerful* than e-Prime

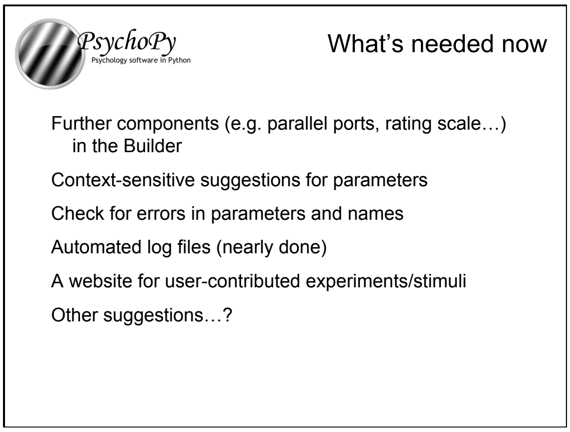
- Real-time dynamic stimuli
- Variety of units and monitor calibration

More *intuitive* that e-Prime

Runs on any platform

Totally free and open source – can be adapted by the user

Introduces people to Python?



What's needed now

Further components (e.g. parallel ports, rating scale…) in the Builder

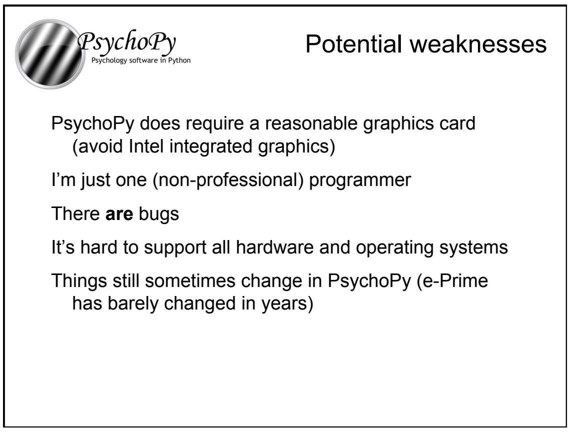
Context-sensitive suggestions for parameters

Check for errors in parameters and names

Automated log files (nearly done)

A website for user-contributed experiments/stimuli

Other suggestions…?



Potential weaknesses

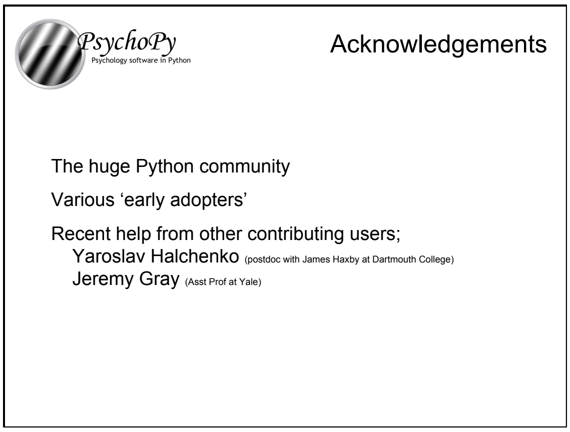
PsychoPy does require a reasonable graphics card (avoid Intel integrated graphics)

I'm just one (non-professional) programmer

There **are** bugs

It's hard to support all hardware and operating systems

Things still sometimes change in PsychoPy (e-Prime has barely changed in years)

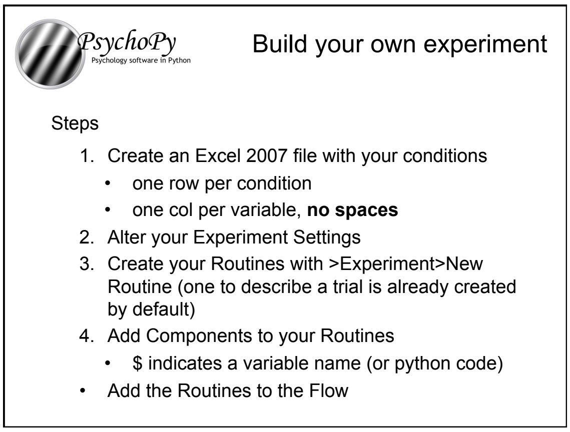


Acknowledgements

The huge Python community

Various 'early adopters'

Recent help from other contributing users;
Yaroslav Halchenko (postdoc with James Haxby at Dartmouth College)
Jeremy Gray (Asst Prof at Yale)

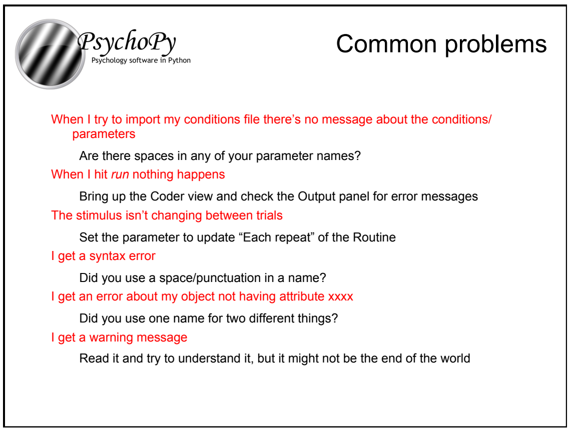


Build your own experiment

Steps

1. Create an Excel 2007 file with your conditions
   - one row per condition
   - one col per variable, **no spaces**
2. Alter your Experiment Settings
3. Create your Routines with >Experiment>New Routine (one to describe a trial is already created by default)
4. Add Components to your Routines
   - $ indicates a variable name (or python code)

- Add the Routines to the Flow



Common problems

When I try to import my conditions file there's no message about the conditions/ parameters

Are there spaces in any of your parameter names?

When I hit *run* nothing happens

Bring up the Coder view and check the Output panel for error messages

The stimulus isn't changing between trials

Set the parameter to update "Each repeat" of the Routine

I get a syntax error

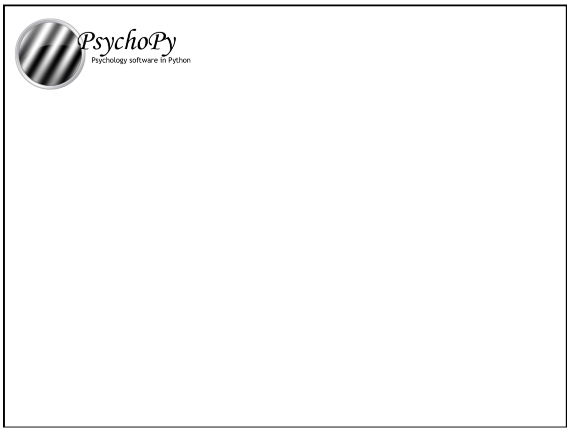
Did you use a space/punctuation in a name?

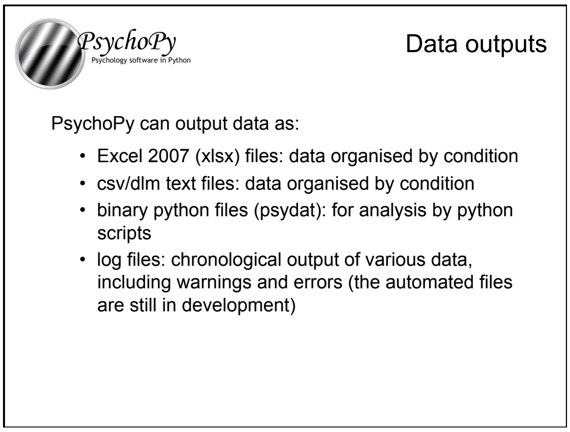
I get an error about my object not having attribute xxxx

Did you use one name for two different things?

I get a warning message

Read it and try to understand it, but it might not be the end of the world



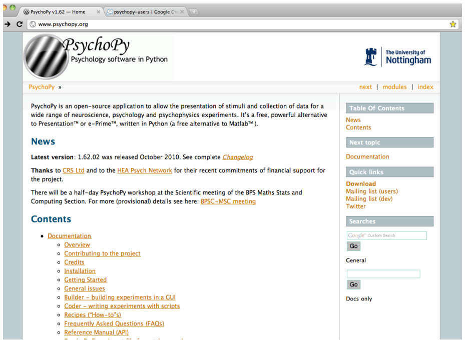


Data outputs

PsychoPy can output data as:

- Excel 2007 (xlsx) files: data organised by condition
- csv/dlm text files: data organised by condition
- binary python files (psydat): for analysis by python scripts
- log files: chronological output of various data, including warnings and errors (the automated files are still in development)

Web page and user mailing list



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The University of Nottingham

PsychoPy »

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PsychoPy is an open-source application to allow the presentation of stimuli and collection of data for a wide range of neuroscience, psychology and psychophysics experiments. It's a free, powerful alternative to Presentation™ or e-Prime™, written in Python (a free alternative to Matlab™).

News

Latest version: 1.62.02 was released October 2010. See complete *Changelog*

Thanks to CRS Ltd and to the HEA Psych Network for their recent commitments of financial support for the project.

There will be a half-day PsychoPy workshop at the Scientific meeting of the BPS Maths Stats and Computing Section. For more (provisional) details see here: BPSC-MSC meeting

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