

Python在实验程序编写中的应用

以PsychoPy为例

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/01 Why Python?



为什么选择Python

1

应用广泛

Web开发，科学计算，网络爬虫，数据分析，人工智能.....

2

简洁易用

解释型语言，大量现成的库



3

支持性好

使用者众多，资料齐全，迭代快速

4

技能储备

作为一种面向未来的工具性技能储备

/02 Why PsychoPy?



为什么选择PsychoPy



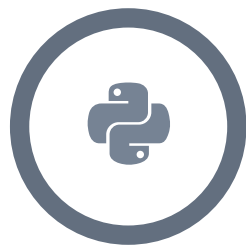
Psychtoolbox-3

Presentation

DMDX

他们的问题?

为什么选择PsychoPy



基于Python语言



开源，免费



兼顾图形化和纯代码



数据简洁



支持在线实验！

/03 What is PsychoPy?



PsychoPy是什么



独立的软件

psychopy.exe

——简洁快速的实验



Python的库

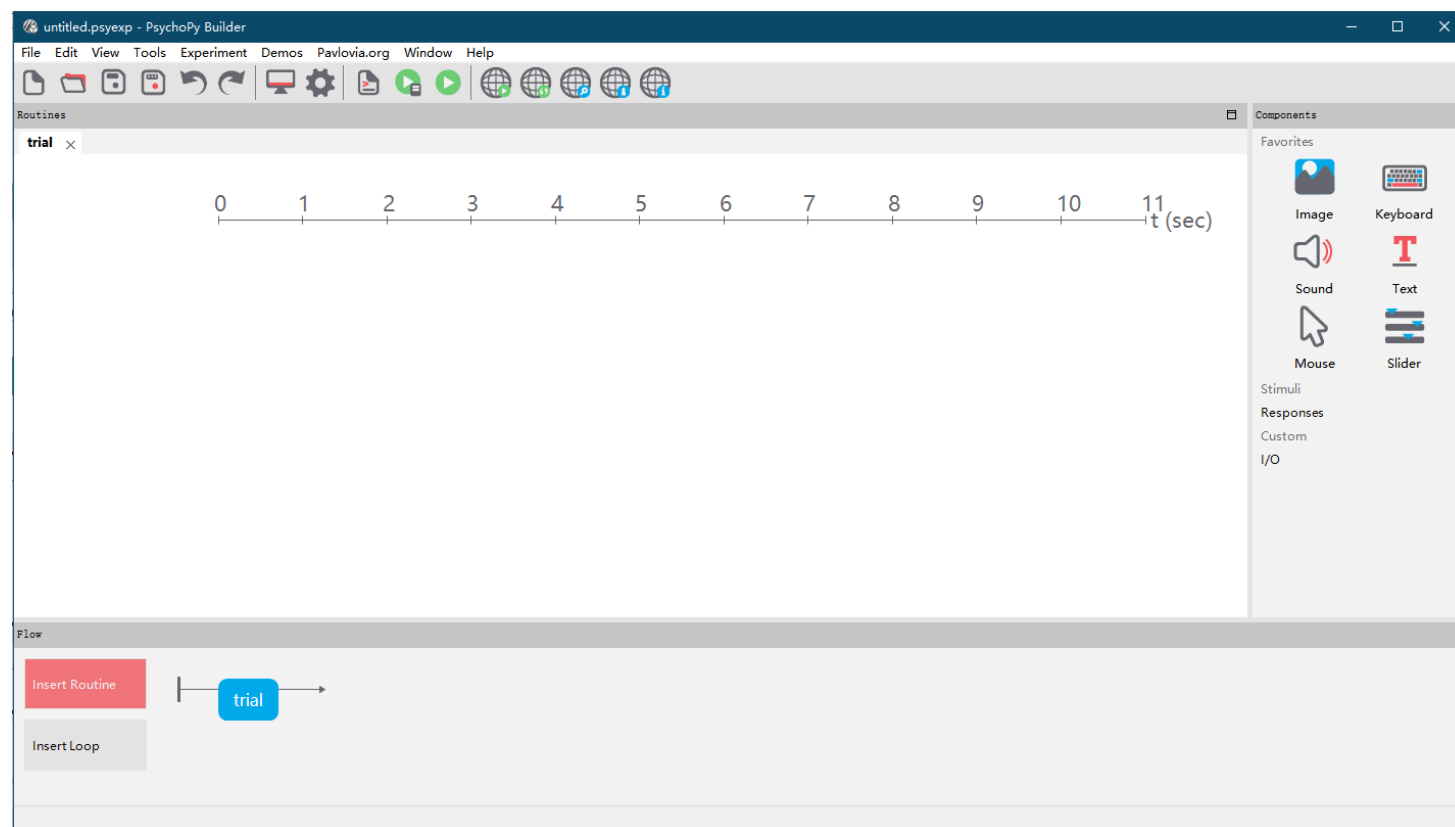
Import psychopy

——复杂& “诡异” 的设计

PsychoPy的使用

psychopy.exe

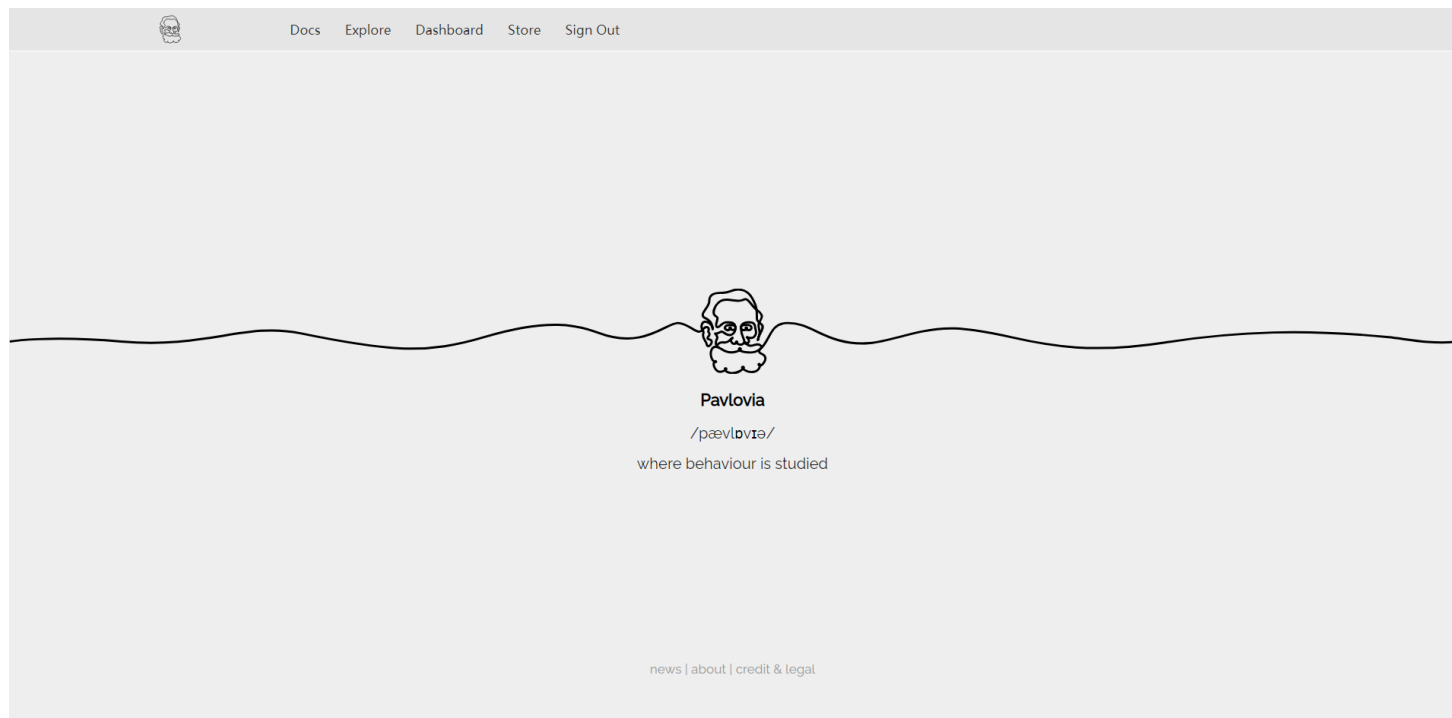
图形化界面，简洁直观，使用控件



PsychoPy的使用

通过Python to JavaScript, 生成H5页面

可发布到在线实验平台[Pavlovia](https://pavlovia.org)上, 实现远程数据采集

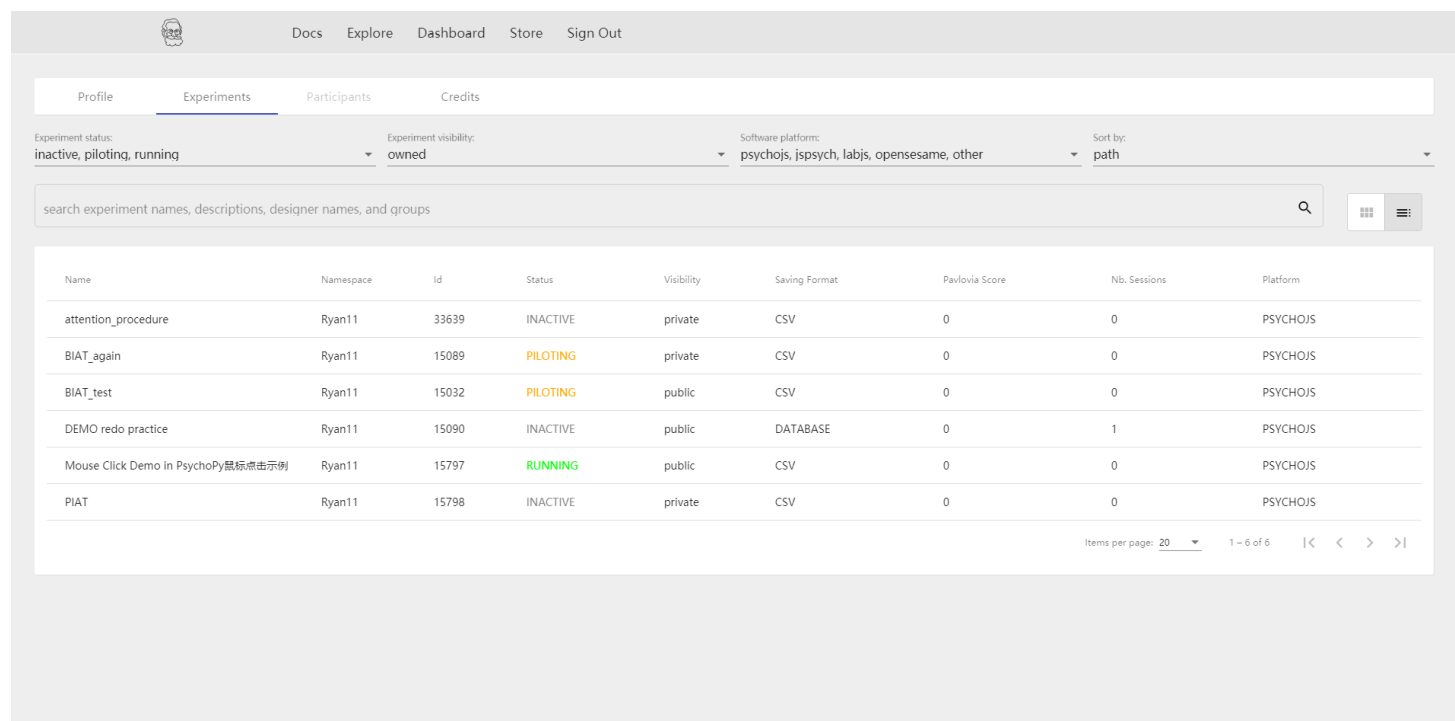


PsychoPy的使用

实为一个Git仓库

支持通过PsychoPy Builder, [OpenSesame](#), [lab.js](#), [jsPsych](#)编写的实验程序

在Explore中, 有大量他人编写的开放的程序文件, 可以克隆学习



The screenshot shows the PsychoPy Explore interface. At the top, there are navigation links: Docs, Explore, Dashboard, Store, and Sign Out. Below this is a header with tabs: Profile, Experiments (selected), Participants, and Credits. Under the Experiments tab, there are filters for Experiment status (inactive, piloting, running), Experiment visibility (owned), Software platform (psychojs, jspsych, labjs, opensesame, other), and Sort by (path). A search bar is present with the placeholder text "search experiment names, descriptions, designer names, and groups". Below the filters is a table listing experiments.

Name	Namespace	Id	Status	Visibility	Saving Format	Pavlov Score	Nb. Sessions	Platform
attention_procedure	Ryan11	33639	INACTIVE	private	CSV	0	0	PSYCHOJS
BIAT_again	Ryan11	15089	PILOTING	private	CSV	0	0	PSYCHOJS
BIAT_test	Ryan11	15032	PILOTING	public	CSV	0	0	PSYCHOJS
DEMO redo practice	Ryan11	15090	INACTIVE	public	DATABASE	0	1	PSYCHOJS
Mouse Click Demo in PsychoPy鼠标点击示例	Ryan11	15797	RUNNING	public	CSV	0	0	PSYCHOJS
PIAT	Ryan11	15798	INACTIVE	private	CSV	0	0	PSYCHOJS

At the bottom right of the table, there is a pagination control showing "Items per page: 20" and "1 - 6 of 6".

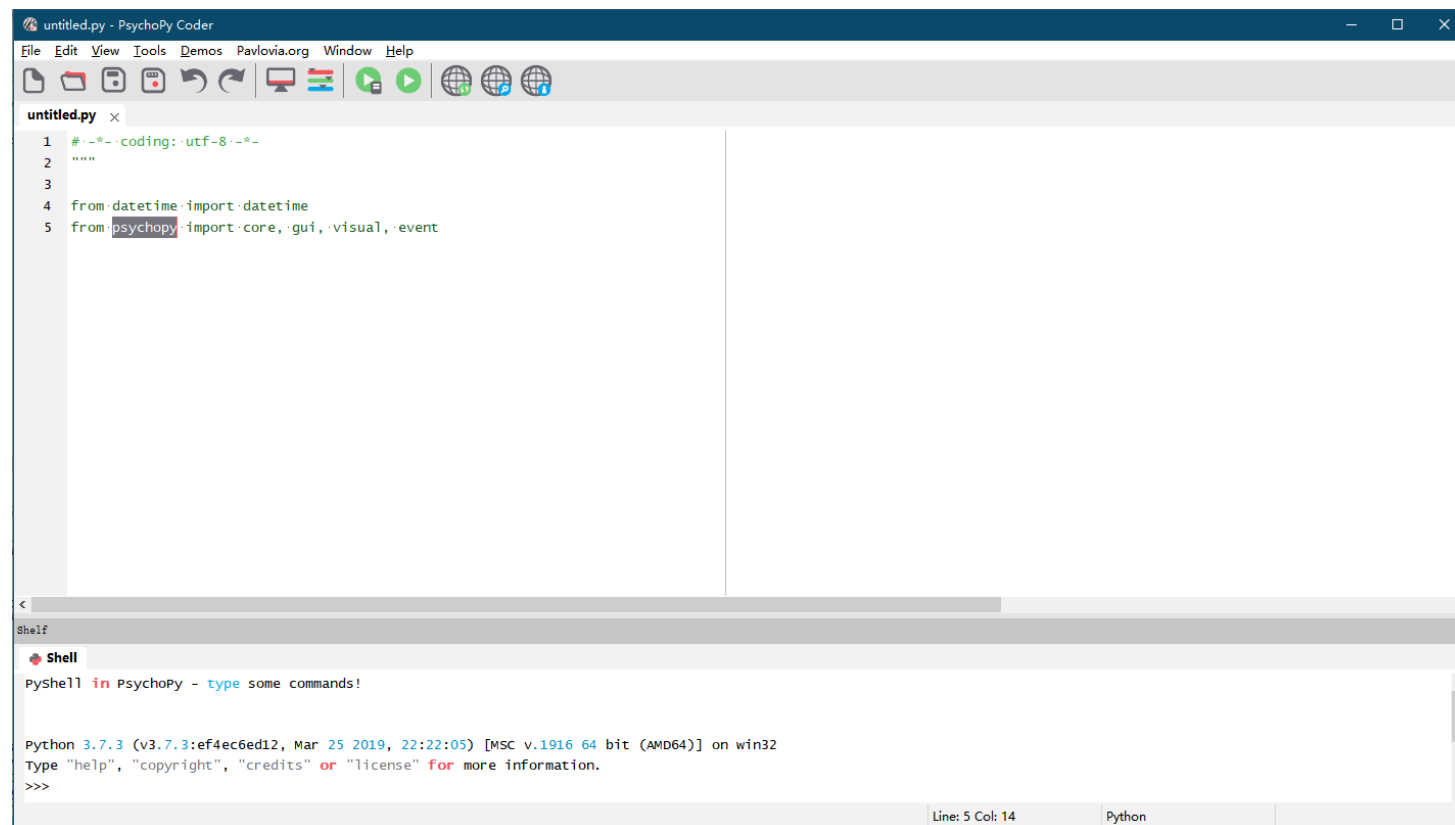
如何使用Pavlovio



PsychoPy的使用

Import psychopy

通过封装好的psychopy库（core, event, visual.....），也可引入其它Python的库，写代码实现功能



The screenshot shows the PsychoPy Code Editor interface. The main window is titled 'untitled.py - PsychoPy Code Editor'. The menu bar includes File, Edit, View, Tools, Demos, Pavlovia.org, Window, and Help. The toolbar contains icons for file operations, running, and help. The code editor shows the following Python code:

```
1 # -*- coding: utf-8 -*-
2 """
3
4 from datetime import datetime
5 from psychopy import core, gui, visual, event
```

Below the code editor is a Shell window. It contains the text: 'PyShell in PsychoPy - type some commands!'. At the bottom of the Shell window, it displays: 'Python 3.7.3 (v3.7.3:ef4ec6ed12, Mar 25 2019, 22:22:05) [MSC v.1916 64 bit (AMD64)] on win32'. It also includes instructions: 'Type "help", "copyright", "credits" or "license" for more information.' and a prompt '>>>>'.

/04

Neuroscience in using PsychoPy



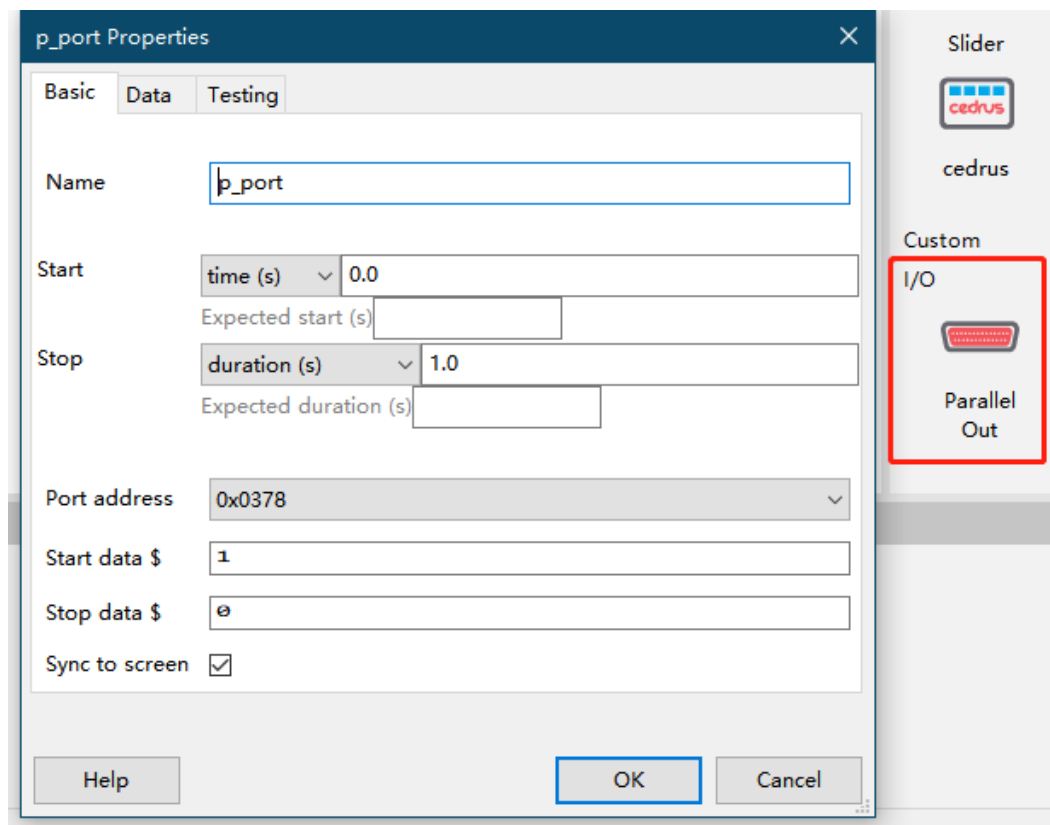
PsychoPy与EEG

如何用E-prime完成EEG实验，即可以用同样的方式用PsychoPy完成

串口

```
import serial
ser = serial.Serial('COM3', 4800)
ser.write(b'a')
ser.write(b'b')
ser.write(b'a')
ser.close
```

并口/LabJack



PsychoPy与fMRI

取决于实验室fMRI设备的扫描方式 & 通信方式，一般有完整的解决方案

并口/LabJack

通过额外的代码搜索扫描仪传输的trigger pulse

```
if In_scanner:
    import ynicstim.parallel_compat
    import ynicstim.trigger
    port = '/dev/parport0'
    p = ynicstim.parallel_compat.getParallelPort(port)
    ts = ynicstim.trigger.ParallelInterruptTriggerSource(port=p)
    trig_collector = ynicstim.trigger.TriggerCollector(triggersource=ts, slicespervol=slices_per_vol)
else:
    trig_collector = None
```

额外的信号转换设备

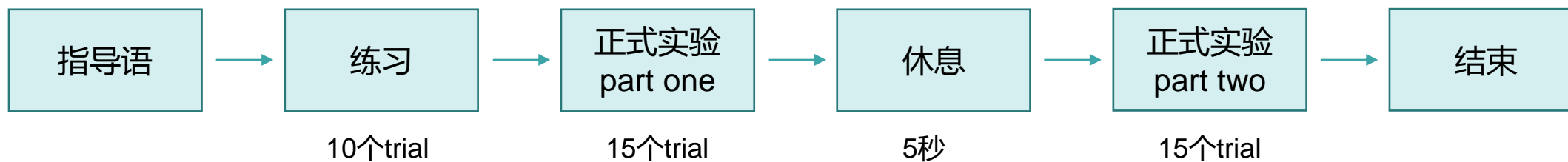
使用TriggerBox将扫描仪传输的trigger pulse转换为模拟的键盘事件，通过设置waitTrigger程序来读取该键盘事件

/05 Tutorial: Go-Nogo Task

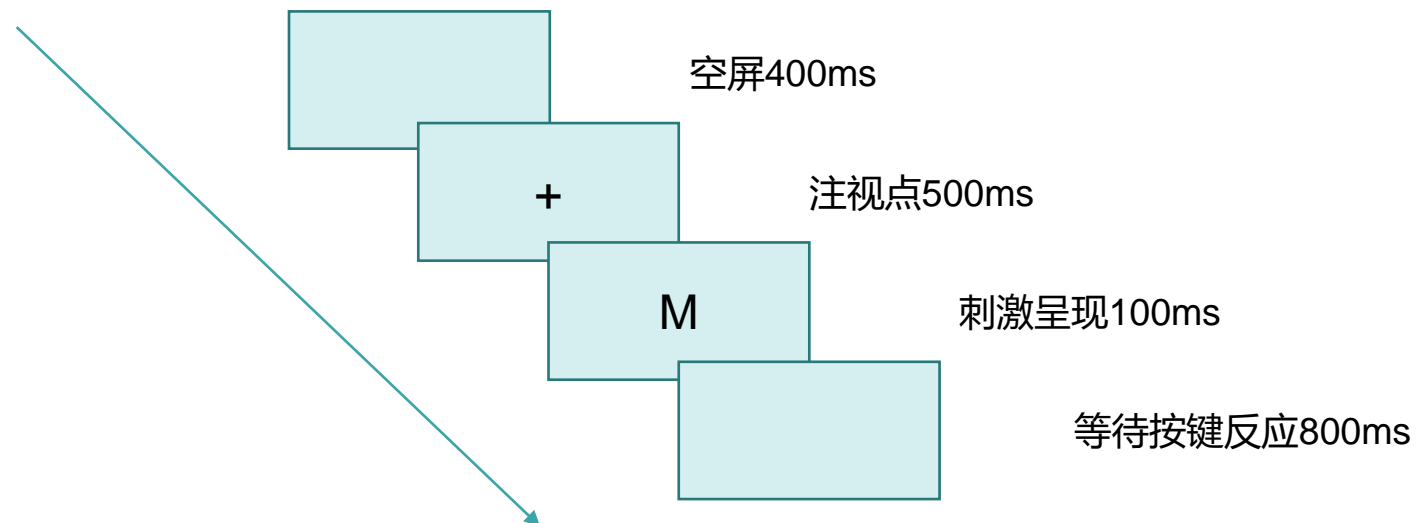


以Go-Nogo实验的编写为例

实验主流程



单个trial流程

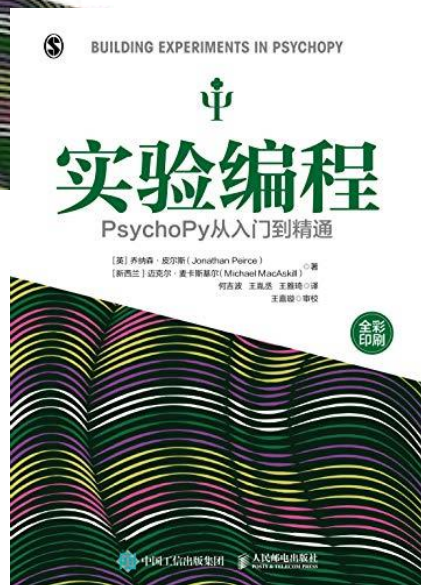
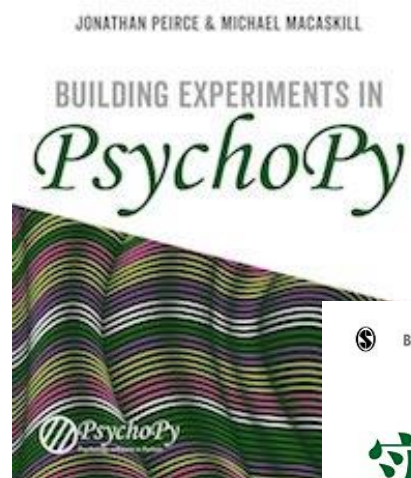


/06 Forum



PsychoPy的学习与交流

书



网络

官方网站: www.psychopy.org

官方论坛: discourse.psychopy.org

在线实验平台: <https://pavlovia.org/explore?sort=DEFAULT>

微信交流群:



PsychoPy学习交流讨论②群



该二维码7天内(11月27日前)有效, 重新进入将更新

An aerial, high-angle photograph of a dense urban skyline, likely New York City, featuring numerous skyscrapers and buildings. The image is faded and serves as a background for the slide.

Thanks!

To make psychological research easier.

Ryan