psychopy_ext: A framework for streamlining research workflow in neuroscience and psychology
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### Streamlining research

**Goals:**
- Automate as much of workflow as possible
- Improve project organization and reproducibility

**Implemented as a Python package that wraps:**
- PsychoPy
- pandas
- matplotlib / seaborn
- pynnpy42

[Image: RESEARCH WORKFLOW]

[Image: Free as in Freedom]

### Features

**Object-oriented**
Many experiments share a common structure. Why not start from a template (a class) that you can reuse? Many useful routines are built-in: experiment loop, automatic testing, data and log handling...

**Simple interface**
A GUI is generated on the fly based on your project. Run and reproduce everything with ease! Command-line ninjas get their interface too.

**Neat project organization**
All project materials have a clear organization and naming conventions. No more mess.

**Simple descriptive statistics**
Compute accuracy across participants and plot in various formats with a couple of lines only. Nice formatting done for you by default.

**Pretty plots**

### Architecture

**Project**
- Study
- Simulation
- Experiment
- Analysis
- FMRI analysis

**Task**
- Event
- Trial
- Block
- Task

**Participant**
- ROI

### The Experiment class

**Experiment:**
- setup
  - get relative info
  - set seed
  - set_logging
  - create_win
  - before_exp
  - after_exp
  - register or push output

**Task:**
- setup_task
  - create_trial
  - create_exp_plan
  - get block
  - before_task
  - for block in self.blocks:
    - self.getBlock
    - self.block
    - after_task
    - register or push output

**Block:**
- set clock
  - before_block
  - for trial in self:
    - self.trial
    - after_block

**Trial:**
- before_trial
  - for event in self.trial:
  - run_trial
  - post_trial
  - write to datfile

**Event:**
- execute event function

### Limitations
- Presumably steeper learning curve because of object-oriented approach
- Not every experiment is possible in this framework
- fMRI analysis still in development

### Future directions
- Automatic analysis report generation
- Project management tool
- GUI for experiment creation and data analysis (similar to Excel's PivotChart)
- Bayesian statistics

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