
pybpodgui-api Documentation

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Scientific Sofware Platform (CF)

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1 Examples	3
1.1 Create a new project	3
1.2 Access to data from a session	4
2 API Models	5
2.1 models.board	5
2.1.1 Overview	5
2.1.2 Implementation	5
2.2 models.experiment	7
2.2.1 Overview	7
2.2.2 Implementation	7
2.3 models.project	8
2.3.1 Overview	8
2.3.2 Implementation	8
2.4 models.session	10
2.4.1 Overview	10
2.4.2 Implementation	10
2.5 models.setup	12
2.5.1 models.board.board_task	12
2.5.1.1 Overview	12
2.5.1.2 Implementation	12
2.5.2 models.board.taskvariable	13
2.5.2.1 Overview	13
2.5.2.2 Implementation	13
2.5.3 Overview	13
2.5.4 Implementation	13
2.6 models.subject	15
2.6.1 Overview	15
2.6.2 Implementation	15
2.7 models.task	16
2.7.1 Overview	16
2.7.2 Implementation	16
3 Project Info	19
3.1 The SWP Team	19
3.2 PyBpod project	19
3.3 License	19

3.4	Maintenance team	20
Index		21

This **API** makes available a set of functions and properties to allow the manipulation of a [PyBpod GUI](#) project using code.

Check the [*Examples*](#) section to learn how to use the API.

CHAPTER 1

Examples

1.1 Create a new project

Create a new project programmatically. The resulting project can be opened with the PyBpod GUI.

```
from pybpodgui_api.models.project import Project

# create the project
proj = Project()
proj.name = 'First project'

# add an experiment to the project
exp = proj.create_experiment()
exp.name = 'First experiment'

# add a setup to the project
stp = exp.create_setup()
stp.name = 'First setup'

# add a board to the project
board = proj.create_board()
board.name = 'First board'
board.serial_port = 'COM3'

# add a subject to the project
subj = proj.create_subject()
subj.name = 'First animal'

# add a new task\protocol to the project
task = proj.create_task()
task.name = 'First task'

exp.task = task # set the task\protocol to the experiment
stp.board = board # set the board to the setup
```

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```
stp += subj # add a subject to the setup  
  
proj.save('my-project-folder')  
  
task.code = 'print("My first protocol")'  
  
proj.save(proj.path)
```

1.2 Access to data from a session

The next examples shows how to access the messages in a pybpod session.

```
from pybpodgui_api.models.project import Project  
  
# create the project  
proj = Project()  
proj.load('my-project-folder')  
  
exp = proj.experiments[0]  
stp = exp.setups[0]  
  
for session in stp.sessions:  
  
    for msg in session.messages_history:  
  
        if msg.check_type('INFO'):  
            pass  
            #Do something  
  
        elif msg.check_type('stderr'):  
            pass  
            #Do something
```

CHAPTER 2

API Models

2.1 models.board

2.1.1 Overview

Enumerates Bpod board supported operations.

2.1.2 Implementation

```
class pybpodgui_api.models.board.Board(project)

    end_run_task_handler()

    freegui()
        Function used to release the processing to update the GUI events

    kill_task()

    load(path)
        Load board data from filesystem

    Variables
        • board_path (str) – Path of the board
        • data (dict) – data object that contains all board info

    log2board(data)
        Function used to update the board log

    pause_trial()

    remove()

    resume_trial()
```

```
run_task_handler(flag=True)
save()
Save experiment data on filesystem.

Variables parent_path (dict) – Project path.

Returns Dictionary containing the board info to save. If None is returned, it means that ther was
a failure.

Return type dict

start_run_task_handler()

stop_task()
stop_thread()
stop_trial()

INFO_BOARD_NAME = 'BOARD-NAME'
INFO_BPODGUI_VERSION = 'BPOD-GUI-VERSION'
INFO_CREATOR_NAME = 'CREATOR-NAME'
INFO_EXPERIMENT_NAME = 'EXPERIMENT-NAME'
INFO_PROJECT_NAME = 'PROJECT-NAME'
INFO_SETUP_NAME = 'SETUP-NAME'
INFO SUBJECT_NAME = 'SUBJECT-NAME'

enabled_behaviorports
Get and set the experiment name

Return type list(Boolean)

enabled_bncports
Get and set enabled bncports

Return type list(Boolean)

enabled_wiredports
Get and set the enabled wired ports

Return type list(Boolean)

name
Get and set the board name

Return type str

net_port
Get and set the experiment name

Return type list(Boolean)

path
Get and set the board path

Return type str

project
Get and set the board project

Return type str
```

serial_port

Get and set the board serial port

Return type str

status

Get and set the board status

Return type str

2.2 models.experiment

2.2.1 Overview

Enumerates Bpod experiment supported operations.

2.2.2 Implementation

```
class pybpodgui_api.models.experiment.Experiment(project)
```

create_setup()

Create new instance of setup

Return type Setup

load(path)

Load experiment data from filesystem

Variables

- **experiment_path** (str) – Path of the experiment
- **data** (dict) – data object that contains all experiment info

Returns Dictionary with loaded experiment info.

remove()

Remove experiment

save()

Save experiment data on filesystem.

Variables parent_path (dict) – Project path.

Returns Dictionary containing the experiment info to save.

Return type dict

name

Get and set the experiment name

Return type str

path

Get and set the experiment files path

Return type str

project

Get and set the experiment project

Return type *Project*

setups

Get the experiment setups

Return type *list(Setup)*

task

Get and set the experiment task

Return type *Task*

2.3 models.project

2.3.1 Overview

Enumerates Bpod project supported operations.

2.3.2 Implementation

```
class pybpodgui_api.models.project.Project
```

create_board()

Add an board to the project, and return it.

Return type *Board*

create_experiment()

Add an experiment to the project, and return it.

Return type *Experiment*

create_subject()

Add an subject to the project, and return it.

Return type *Subject*

create_task()

Add an task to the project, and return it.

Return type *Task*

create_user()

Add a user bject to the project, and return it.

Return type *User*

find_board(name)

Find a board by the name

Variables *name (str)* – Name of the board to find.

Return type *Board*

find_session(uuid4)

find_setup_by_id(uuid4)

Find a setup by the id

Variables *uuid4 (str)* – UUID4 of the setup to find.

Return type *Setup*

find_subject (*name*)

Find a subject by the name

Variables *name* (*str*) – Name of the subject to find.

Return type *Subject*

find_subject_by_id (*uuid4*)

Find a subject by the name

Variables *name* (*str*) – Name of the subject to find.

Return type *Subject*

find_task (*name*)

Find a task by the name

Variables *name* (*str*) – Name of the task to find.

Return type *Task*

find_user (*username*)

import_task (*filepath*, *importdir=False*)

is_saved()

Verifies if project has changes by doing a recursive checksum on all entities

Return type *bool*

load (*project_path*)

Load project from a folder.

Variables *project_path* (*str*) – Full path of the project to load.

remove_non_existing_repositories (*path*, *names*)

save (*project_path*)

Save project data on file :param str project_path: path to project :return: project data saved on settings file

boards

Get the list of boards in the project

Return type *list(Board)*

experiments

Get the list of experiments in the project

Return type *list(Experiment)*

name

Get and set the project name

Return type *str*

path

Get and set the project path

Return type *str*

subjects

Get the list of subjects in the project

Return type *list(Subject)*

tasks

Get the list of tasks in the project

Return type `list(Task)`

users

Get the list of users in the project

Return type `list(User)`

2.4 `models.session`

2.4.1 Overview

Enumerates Bpod session supported operations.

2.4.2 Implementation

```
class pybpodgui_api.models.session.Session(setup)
```

load(*path*)

Parameters

- **session_path** –
- **data** –

Returns

load_contents(*init_func=None*, *update_func=None*, *end_func=None*)

Parses session history file, line by line and populates the history message on memory.

load_info()

remove()

Remove the session from the project

save()

Parameters `parent_path` –

Returns

`STATUS_READY = 0`

`STATUS_SESSION_RUNNING = 1`

board_name

Get and set board name

Return type `str`

board_serial_port

Get and set board serial port

Return type `str`

ended

Get and set the end datetime of the session

Return type `datetime.datetime`

filepath
is_running
messages_history
Get and set the history of messages

Return type `list(BaseMessage)`

name
Get and set session name

Return type `str`

path
Get and set path name

Return type `str`

project
Get the session Project

Return type `Project`

setup
Get and set the setup

Return type `Setup`

setup_name
Get and set setup name

Return type `str`

started
Get and set the start datetime of the session

Return type `datetime.datetime`

status
Get and set the session status

Return type `str`

subjects
Get and set session name

Return type

task
Get the session Task

Return type `Task`

task_name
Get and set the task name

Return type `str`

variables

2.5 models.setup

2.5.1 models.board.board_task

2.5.1.1 Overview

Enumerates Bpod BoardTask supported operations.

2.5.1.2 Implementation

class pybpodgui_api.models.setup.board_task.**BoardTask** (*setup*)

Represents the association between one board and one task

Variables **setup** (*Setup*) – Setup to which the BoardTask belongs to

create_variable (*name=None*, *value=None*, *datatype='string'*)

Create a variable

Return type *TaskVariable*

load (*data*)

Load setup data from filesystem

Variables

- **setup_path** (*str*) – Path of the setup

- **data** (*dict*) – data object that contains all setup info

save ()

Save board task data on filesystem.

Variables **setup_path** (*str*) – Setup path.

Returns Dictionary containing the board task info to save.

Return type *dict*

board

Get and set the board

Return type *Board*

task

Get and set the Task

Return type *Task*

update_variables

Get and set a flag that indicates if the variables should be updated at the end of the session

Return type *bool*

variables

Get and set list of variables

Return type *list(TaskVariable)*

2.5.2 models.board.taskvariable

2.5.2.1 Overview

Enumerates Bpod task variable supported operations.

2.5.2.2 Implementation

```
class pybpodgui_api.models.setup.task_variable.TaskVariable(board_task,
                                                               name=None,
                                                               value=None,
                                                               datatype='string')
```

load(*data*)

Load variable data from filesystem

Variables

- **setup_path** (*str*) – Path of the setup
- **data** (*dict*) – data object that contains all setup info

save()

Save variable data on filesystem.

Variables **setup_path** (*str*) – Setup path.

Returns Dictionary containing the variable info to save.

Return type *dict*

datatype

Get and set variable data type. It can be from type ‘number’ or ‘string’

Return type *str*

name

Get and set variable name

Return type *str*

value

Get and set variable value

Return type *str*

2.5.3 Overview

Enumerates Bpod setup supported operations.

2.5.4 Implementation

```
class pybpodgui_api.models.setup.Setup(experiment)
```

can_run_task()

clear_subjects()

create_board_task()
Create a new BoardTask object

Return type *BoardTask*

create_session()
Create a new Session object

Return type *Session*

kill_task()

load(path)
Load setup data from filesystem

Variables

- **setup_path** (*str*) – Path of the setup
- **data** (*dict*) – data object that contains all setup info

pause_trial()

remove()
Remove the setup from the project

resume_trial()

save()
Save setup data on filesystem.

Variables **parent_path** (*str*) – Experiment path.

Returns Dictionary containing the setup info to save.

Return type *dict*

stop_task()

stop_trial()

board

Get and set setup board

Return type *Board*

detached

experiment

Get and set the experiment

Return type *Experiment*

last_session

Get last created session

Return type *Session*

name

Get and set setup name

Return type *str*

net_port

path

Get and set setup path

Return type `str`

project
Get project

Return type `Project`

sessions
Get the list of sessions

Return type `list(Session)`

status

subjects
Get list of subjects

Return type `list(Subject)`

task
Get and set task

Return type `Task`

update_variables

2.6 models.subject

2.6.1 Overview

Enumerates Bpod Subject supported operations.

2.6.2 Implementation

```
class pybpodgui_api.models.subject.Subject(project)

    can_run_task()

    get_sessions()
        Get all subject sessions

        Return type list(Session)

    load(path)
        Load subject data from filesystem

        Variables
            • subject_path(str) – Path of the subject
            • data(dict) – data object that contains all subject info

    post_load()

    remove()
        Remove the subject from the project

    run_task()

    save()
        Save subject data on filesystem.
```

Variables `project_path` (`str`) – Project path.
Returns Dictionary containing the setup info to save.
Return type `dict`

toJSON()

name
Get and set setup name
Return type `str`

path
Get and set the path
Return type `str`

project
Get and set project
Return type `str`

setup
Get and set project
Return type `str`

2.7 `models.task`

2.7.1 Overview

Enumerates Bpod Task supported operations.

2.7.2 Implementation

class `pybpodgui_api.models.task.Task` (`project=None`)

create_execcmd()
create_scriptcmd()
load(path)
Load setup data from filesystem

Variables

- `task_path` (`str`) – Path of the task
- `data` (`dict`) – data object that contains all task info

make_emptyfile()
Creates the task folder if does not exists and an empty code file

make_path()
Creates the task folder

remove()
Remove the task from the project.

save()

Save setup data on filesystem.

Variables

- **project_path** (*str*) – Project path.
- **data** (*dict*) – Dictionary where to save the data to.

Returns Dictionary containing the task info to save.

Return type *dict*

commands

Get commands

Return type *list(TaskCommand)*

filepath

Get and set task file path

Return type *str*

name

Get and set task name

Return type *str*

path

Get and set task path

Return type *str*

project

Get and set project

Return type *Project*

trigger_softcodes

Get net port

Return type *int*

CHAPTER 3

Project Info

3.1 The SWP Team



Scientific Software Platform (Champalimaud Foundation)

The Scientific Software Platform (SWP) from the Champalimaud Foundation provides technical know-how in software engineering and high quality software support for the Neuroscience and Cancer research community at the Champalimaud Foundation.

We typical work on computer vision / tracking, behavioral experiments, image registration and database management.

3.2 PyBpod project

PyBpod is a python port of the [Bpod Matlab project](#).

All examples and Bpod's state machine and communication logic were based on the original version made available by [Josh Sanders \(Sanworks\)](#).

3.3 License

This is Open Source software with a MIT license.

3.4 Maintenance team

The current and past members of the **pybpodgui-api** team.

- [@cajomferro](#) Carlos Mão de Ferro
- [@JBauto](#) João Baúto
- [@UmSenhorQualquer](#) Ricardo Ribeiro
- [@MicBoucinha](#) Luís Teixeira

Index

B

Board (class in `pybpodgui_api.models.board`), 5
board (`pybpodgui_api.models.setup.board_task.BoardTask` attribute), 12
board (`pybpodgui_api.models.setup.Setup` attribute), 14
board_name (`pybpodgui_api.models.session.Session` attribute), 10
board_serial_port (`pybpodgui_api.models.session.Session` attribute), 10
boards (`pybpodgui_api.models.project.Project` attribute), 9
BoardTask (class in `pybpodgui_api.models.setup.board_task`), 12

C

can_run_task () (`pybpodgui_api.models.setup.Setup` method), 13
can_run_task () (`pybpodgui_api.models.subject.Subject` method), 15
clear_subjects () (`pybpodgui_api.models.setup.Setup` method), 13
commands (`pybpodgui_api.models.task.Task` attribute), 17
create_board () (`pybpodgui_api.models.project.Project` method), 8
create_board_task () (`pybpodgui_api.models.setup.Setup` method), 13
create_execcmd () (`pybpodgui_api.models.task.Task` method), 16
create_experiment () (`pybpodgui_api.models.project.Project` method), 8
create_scriptcmd () (`pybpodgui_api.models.task.Task` method), 16
create_session () (`pybpodgui_api.models.setup.Setup`

method), 14

create_setup () (`pybpodgui_api.models.experiment.Experiment` method), 7
create_subject () (`pybpodgui_api.models.project.Project` method), 8
create_task () (`pybpodgui_api.models.project.Project` method), 8
create_user () (`pybpodgui_api.models.project.Project` method), 8
create_variable () (`pybpodgui_api.models.setup.board_task.BoardTask` method), 12

D

datatype (`pybpodgui_api.models.setup.task_variable.TaskVariable` attribute), 13
detached (`pybpodgui_api.models.setup.Setup` attribute), 14

E

enabled_behaviorports (`pybpodgui_api.models.board.Board` attribute), 6
enabled_bncports (`pybpodgui_api.models.board.Board` attribute), 6
enabled_wiredports (`pybpodgui_api.models.board.Board` attribute), 6
end_run_task_handler () (`pybpodgui_api.models.board.Board` method), 5
ended (`pybpodgui_api.models.session.Session` attribute), 10
Experiment (class in `pybpodgui_api.models.experiment`), 7
experiment (`pybpodgui_api.models.setup.Setup` attribute), 14
experiments (`pybpodgui_api.models.project.Project` attribute), 9

F

```
filepath (pybpodgui_api.models.session.Session attribute), 11
filepath (pybpodgui_api.models.task.Task attribute), 17
find_board() (pybpodgui_api.models.project.Project method), 8
find_session() (pybpodgui_api.models.project.Project method), 8
find_setup_by_id()
    (pybpodgui_api.models.project.Project method), 8
find_subject() (pybpodgui_api.models.project.Project method), 9
find_subject_by_id()
    (pybpodgui_api.models.project.Project method), 9
find_task() (pybpodgui_api.models.project.Project method), 9
find_user() (pybpodgui_api.models.project.Project method), 9
freegui() (pybpodgui_api.models.board.Board method), 5
```

G

```
get_sessions() (pybpodgui_api.models.subject.Subject method), 15
```

I

```
import_task() (pybpodgui_api.models.project.Project method), 9
```

```
INFO_BOARD_NAME (pybpodgui_api.models.board.Board attribute), 6
```

```
INFO_BPODGUI_VERSION
    (pybpodgui_api.models.board.Board attribute), 6
```

```
INFO_CREATOR_NAME
    (pybpodgui_api.models.board.Board attribute), 6
```

```
INFO_EXPERIMENT_NAME
    (pybpodgui_api.models.board.Board attribute), 6
```

```
INFO_PROJECT_NAME
    (pybpodgui_api.models.board.Board attribute), 6
```

```
INFO_SETUP_NAME (pybpodgui_api.models.board.Board attribute), 6
```

```
INFO SUBJECT_NAME
    (pybpodgui_api.models.board.Board attribute), 6
```

```
is_running (pybpodgui_api.models.session.Session attribute), 11
```

```
is_saved() (pybpodgui_api.models.project.Project method), 9
```

K

```
kill_task() (pybpodgui_api.models.board.Board method), 5
kill_task() (pybpodgui_api.models.setup.Setup method), 14
```

L

```
last_session (pybpodgui_api.models.setup.Setup attribute), 14
load() (pybpodgui_api.models.board.Board method), 5
load() (pybpodgui_api.models.experiment.Experiment method), 7
load()
    (pybpodgui_api.models.project.Project method), 9
load()
    (pybpodgui_api.models.session.Session method), 10
load() (pybpodgui_api.models.setup.board_task.BoardTask method), 12
load() (pybpodgui_api.models.setup.Setup method), 14
load() (pybpodgui_api.models.setup.task_variable.TaskVariable method), 13
load()
    (pybpodgui_api.models.subject.Subject method), 15
```

```
load() (pybpodgui_api.models.task.Task method), 16
load_contents() (pybpodgui_api.models.session.Session method), 10
load_info() (pybpodgui_api.models.session.Session method), 10
```

```
log2board() (pybpodgui_api.models.board.Board method), 5
```

M

```
make_emptyfile() (pybpodgui_api.models.task.Task method), 16
```

```
make_path() (pybpodgui_api.models.task.Task method), 16
```

```
messages_history (pybpodgui_api.models.session.Session attribute), 11
```

N

```
name (pybpodgui_api.models.board.Board attribute), 6
name (pybpodgui_api.models.experiment.Experiment attribute), 7
```

```
name (pybpodgui_api.models.project.Project attribute), 9
```

```
name (pybpodgui_api.models.session.Session attribute), 11
```

```
name (pybpodgui_api.models.setup.Setup attribute), 14
```

```
name (pybpodgui_api.models.setup.task_variable.TaskVariable attribute), 13
```

```
name (pybpodgui_api.models.subject.Subject attribute), 16
```

```
name (pybpodgui_api.models.task.Task attribute), 17
```

```

net_port (pybpodgui_api.models.board.Board attribute), 6
net_port (pybpodgui_api.models.setup.Setup attribute), 14

P
path (pybpodgui_api.models.board.Board attribute), 6
path (pybpodgui_api.models.experiment.Experiment attribute), 7
path (pybpodgui_api.models.project.Project attribute), 9
path (pybpodgui_api.models.session.Session attribute), 11
path (pybpodgui_api.models.setup.Setup attribute), 14
path (pybpodgui_api.models.subject.Subject attribute), 16
path (pybpodgui_api.models.task.Task attribute), 17
pause_trial() (pybpodgui_api.models.board.Board method), 5
pause_trial() (pybpodgui_api.models.setup.Setup method), 14
post_load() (pybpodgui_api.models.subject.Subject method), 15
Project (class in pybpodgui_api.models.project), 8
project (pybpodgui_api.models.board.Board attribute), 6
project (pybpodgui_api.models.experiment.Experiment attribute), 7
project (pybpodgui_api.models.session.Session attribute), 11
project (pybpodgui_api.models.setup.Setup attribute), 15
project (pybpodgui_api.models.subject.Subject attribute), 16
project (pybpodgui_api.models.task.Task attribute), 17

R
remove() (pybpodgui_api.models.board.Board method), 5
remove() (pybpodgui_api.models.experiment.Experiment method), 7
remove() (pybpodgui_api.models.session.Session method), 10
remove() (pybpodgui_api.models.setup.Setup method), 14
remove() (pybpodgui_api.models.subject.Subject method), 15
remove() (pybpodgui_api.models.task.Task method), 16
remove_non_existing_repositories() (pybpodgui_api.models.project.Project method), 9

resume_trial() (pybpodgui_api.models.board.Board method), 5
resume_trial() (pybpodgui_api.models.setup.Setup method), 14
run_task() (pybpodgui_api.models.subject.Subject method), 15
run_task_handler() (pybpodgui_api.models.board.Board method), 5

S
save() (pybpodgui_api.models.board.Board method), 6
save() (pybpodgui_api.models.experiment.Experiment method), 7
save() (pybpodgui_api.models.project.Project method), 9
save() (pybpodgui_api.models.session.Session method), 10
save() (pybpodgui_api.models.setup.board_task.BoardTask method), 12
save() (pybpodgui_api.models.setup.Setup method), 14
save() (pybpodgui_api.models.setup.task_variable.TaskVariable method), 13
save() (pybpodgui_api.models.subject.Subject method), 15
save() (pybpodgui_api.models.task.Task method), 16
serial_port (pybpodgui_api.models.board.Board attribute), 6
Session (class in pybpodgui_api.models.session), 10
sessions (pybpodgui_api.models.setup.Setup attribute), 15
Setup (class in pybpodgui_api.models.setup), 13
setup (pybpodgui_api.models.session.Session attribute), 11
setup (pybpodgui_api.models.subject.Subject attribute), 16
setup_name (pybpodgui_api.models.session.Session attribute), 11
setups (pybpodgui_api.models.experiment.Experiment attribute), 8
start_run_task_handler() (pybpodgui_api.models.board.Board method), 6
started (pybpodgui_api.models.session.Session attribute), 11
status (pybpodgui_api.models.board.Board attribute), 7
status (pybpodgui_api.models.session.Session attribute), 11
status (pybpodgui_api.models.setup.Setup attribute), 15
STATUS_READY (pybpodgui_api.models.session.Session attribute), 10
STATUS_SESSION_RUNNING

```

```
(pybpodgui_api.models.session.Session      at-  variables (pybpodgui_api.models.setup.board_task.BoardTask
tribute), 10                                attribute), 12
stop_task ()      (pybpodgui_api.models.board.Board
                   method), 6
stop_task ()      (pybpodgui_api.models.setup.Setup
                   method), 14
stop_thread ()    (pybpodgui_api.models.board.Board
                   method), 6
stop_trial ()     (pybpodgui_api.models.board.Board
                   method), 6
stop_trial ()     (pybpodgui_api.models.setup.Setup
                   method), 14
Subject (class in pybpodgui_api.models.subject), 15
subjects (pybpodgui_api.models.project.Project  at-
          tribute), 9
subjects (pybpodgui_api.models.session.Session  at-
          tribute), 11
subjects (pybpodgui_api.models.setup.Setup      at-
          tribute), 15
```

T

```
Task (class in pybpodgui_api.models.task), 16
task (pybpodgui_api.models.experiment.Experiment at-
      tribute), 8
task (pybpodgui_api.models.session.Session attribute),
      11
task (pybpodgui_api.models.setup.board_task.BoardTask
      attribute), 12
task (pybpodgui_api.models.setup.Setup attribute), 15
task_name (pybpodgui_api.models.session.Session at-
          tribute), 11
tasks (pybpodgui_api.models.project.Project      at-
       tribute), 9
TaskVariable           (class           in
                      pybpodgui_api.models.setup.task_variable), 13
toJSON ()      (pybpodgui_api.models.subject.Subject
                  method), 16
trigger_softcodes
                  (pybpodgui_api.models.task.Task attribute), 17
```

U

```
update_variables (pybpodgui_api.models.setup.board_task.BoardTask
                  attribute), 12
update_variables (pybpodgui_api.models.setup.Setup
                  attribute), 15
users (pybpodgui_api.models.project.Project      at-
       tribute), 10
```

V

```
value (pybpodgui_api.models.setup.task_variable.TaskVariable
       attribute), 13
variables (pybpodgui_api.models.session.Session at-
          tribute), 11
```