

RoboCup@Home Education

ONLINE CHALLENGE 2020

Online Classroom Standard Platform

06 Advanced Programming

RoboCup@Home Education | 2020.05.21

RoboCup@Home
EDUCATION

 **SoftBank**
Robotics

Online Challenge 2020: Online Classroom SP

06 Advanced Programming

Speakers: Luca locchi, Jeffrey Tan, SoftBank Robotics

Time: **May 21, 2020 (Thu) 19:00 - 20:00 (GMT+8)**

Zoom: <https://cernet.zoom.com.cn/j/64580114300> (ID: 645 8011 4300)

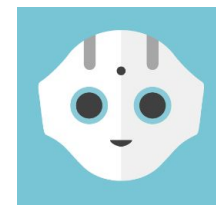
PW: robocup

Online Classroom:

<https://www.robocupathomeedu.org/learn/online-classroom/online-challenge-2020>

** Privacy reminder: Video will be recorded and published online.

@HomeEDU Online Challenge 2020 Certificates and Awards

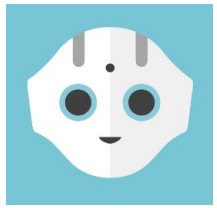


- **Participation Certificates:** Registered teams who submitted a reasonable project (i.e., some extension and integration of the parts provided).
- **Awards and Certificates by SoftBank Robotics**



*Win a Pepper Figurine
for your team!*

*And goodies for all
members...*



Competition Time Schedule

Online Classroom

- 6 classes: April 16 ~ May 21, 2020

Robot Development Support

- Team development: May 21 ~ June 1, 2020
- Submission of review materials: **June 1, 2020**
- Robot and video support: June 1 ~ June 10, 2020

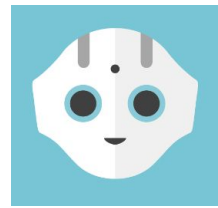
Technical Video Challenge

- Submission: **June 10, 2020**
- Review: June 10 ~ 15, 2020

Online Challenge 2020 (Finals)

- RoboCup week: June 24 ~ 28, 2020
- Meeting+FAQ+Setup (one day) + Finals (one day)

Technical Video Challenge



Submission: **June 10, 2020**

Format: Submission of Video Challenge Materials to oc@robocupathomeedu.org

- **Technical Video:** Video showing the best robot performance.
- **Video Description Paper:** Technical description and photo of the robot system and operation in the video.
 - ** Video Description Paper: Free format, maximum A4 size 4 pages.
 - ** Please host the video online and submit only the link.
 - ** The email subject should be: [@HomeEDUOnline2020-Video] (Your Team Name)

Challenge:

- Technical Video and Documentation: Presentation and Demonstration
- Themes:
 - Solving the competition tasks in the Rules 2020.
 - Open scenario based on the Finals in the Rules 2020.
 - Robot applications to address the current **COVID-19** pandemic situation.



Robot Development Support (Especially for Teams Without Robot)

- Team development: May 21 ~ June 1, 2020
- Submission of review materials: **June 1, 2020**
- Robot and video support: June 1 ~ June 10, 2020

Review materials

- Project files - Push to GitHub and submit the link
- Project files description - To explain the contents and execution procedures
- Submit to oc@robocupathomeedu.org
- The email subject should be: [@HomeEDUOnline2020-Pepper2.9] (Your Team Name)



Action creation and execution

Create actions

```
say1Action = SayBuilder.with(qiContext) // Create the builder  
    .withText("Hello.") // Set the text to say.  
    .build(); // Build the say action.
```

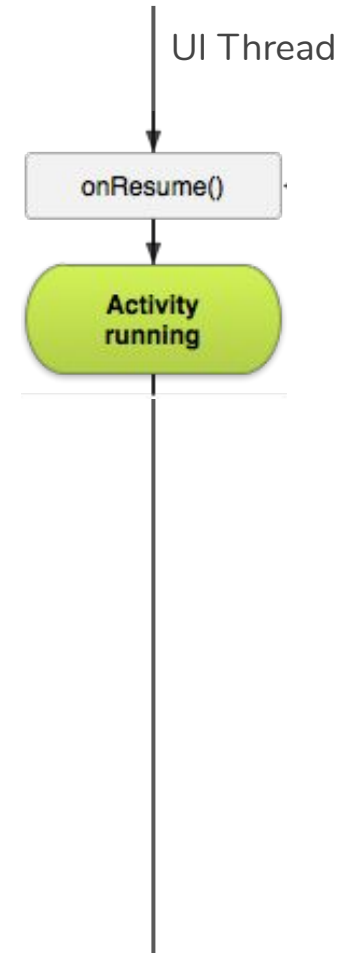
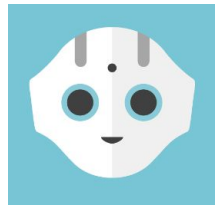
```
gorillaAction = AnimateBuilder.with(qiContext) // Create the builder  
    .withAnimation(animation) // Set the animation.  
    .build(); // Build the animate action.
```

Run actions

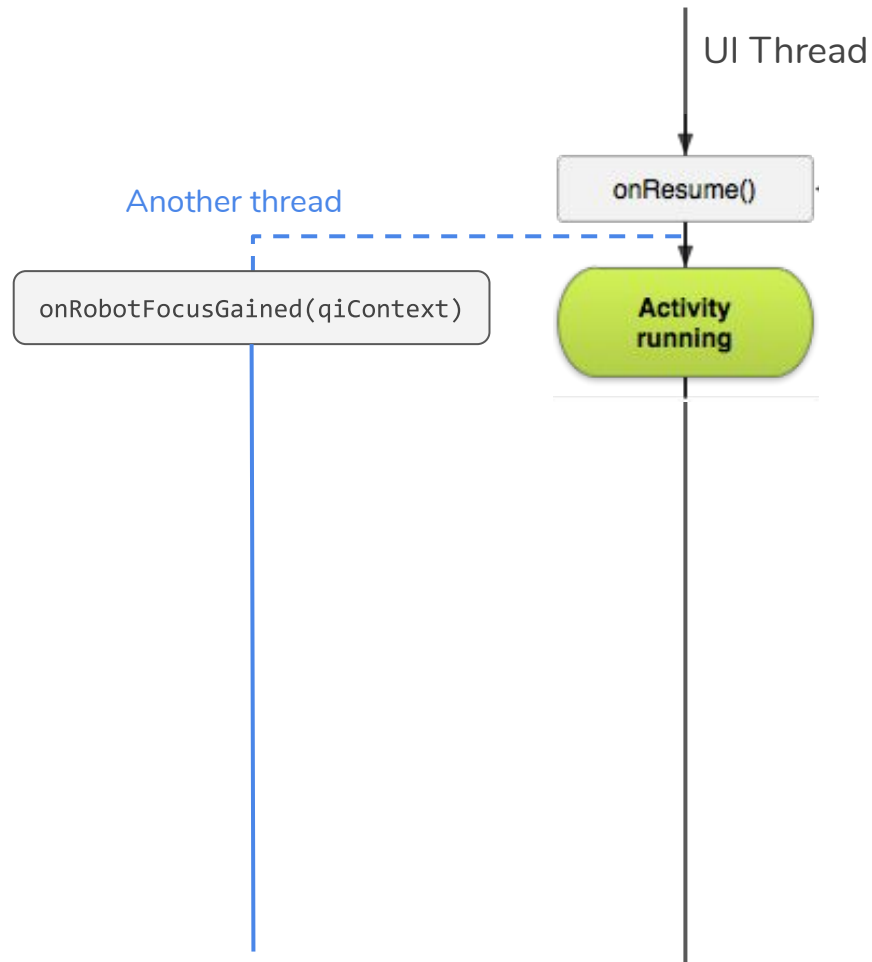
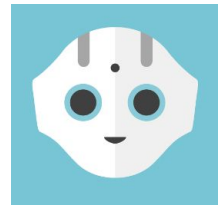
```
say1Action.run() // Blocking (do not run on UI thread)
```

```
gorillaAction.async().run() // Non-blocking
```

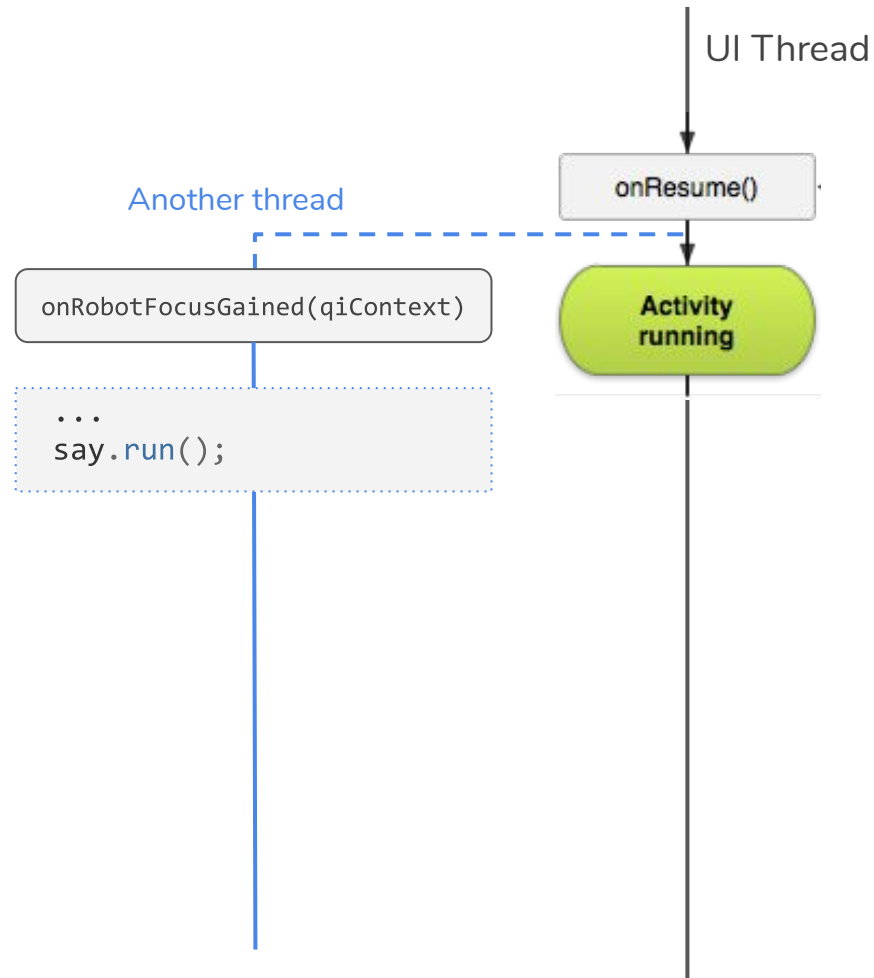
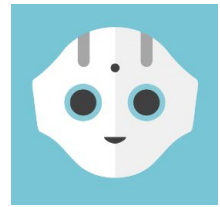
Action Synchronization



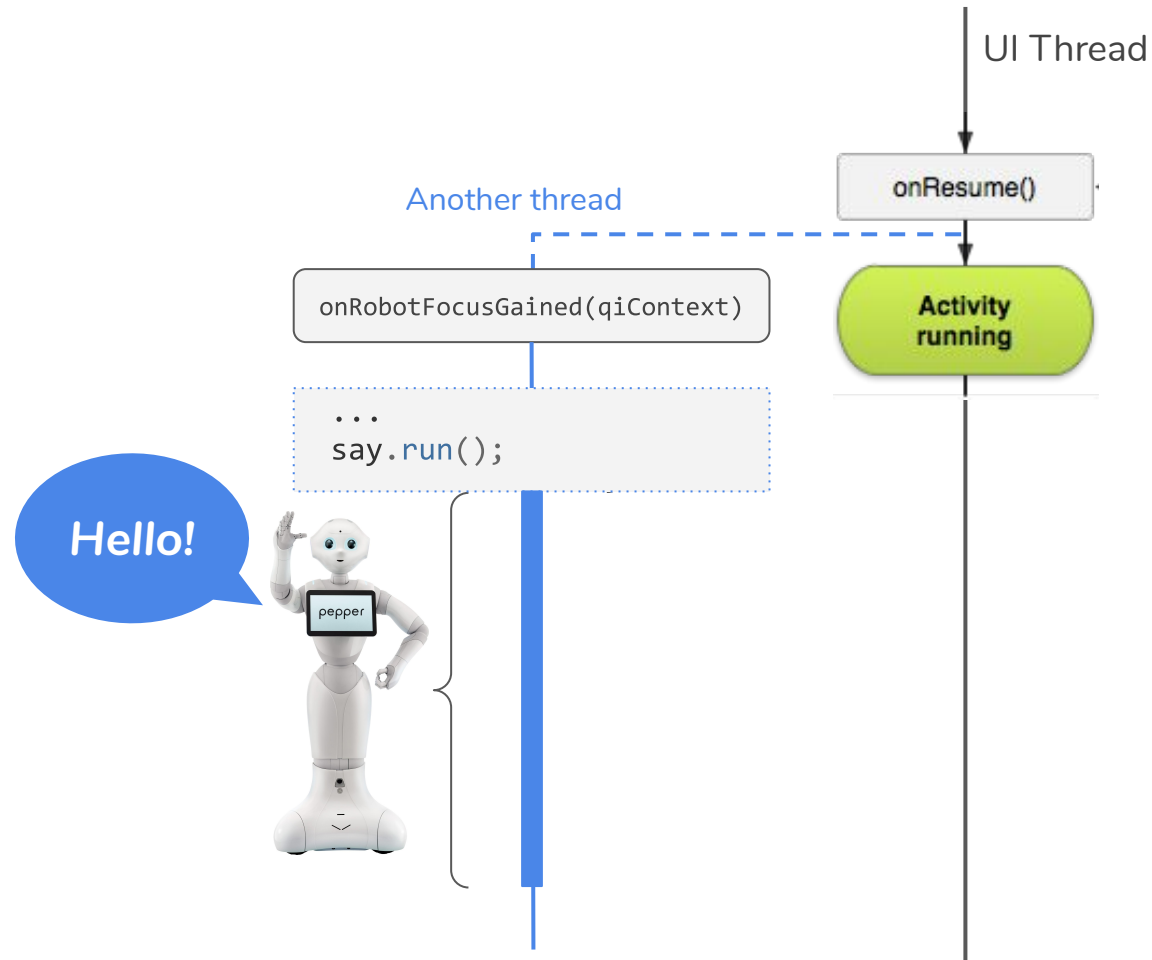
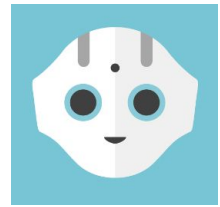
Action Synchronization



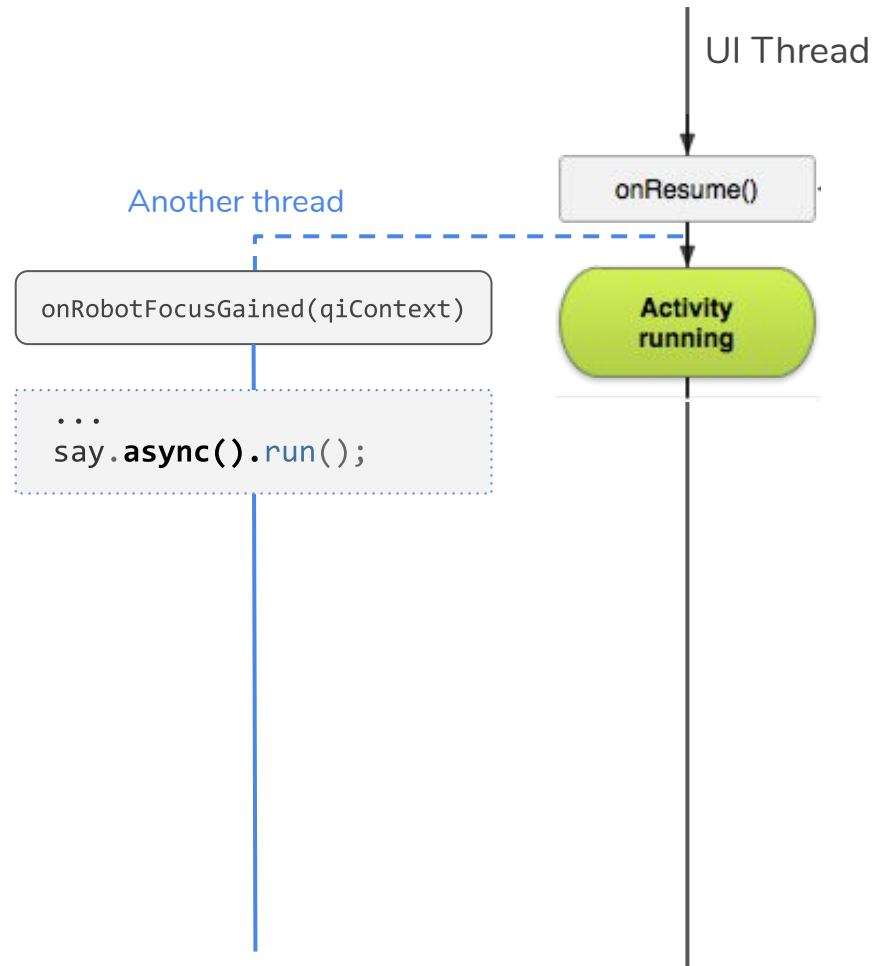
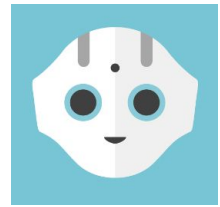
Action Synchronization



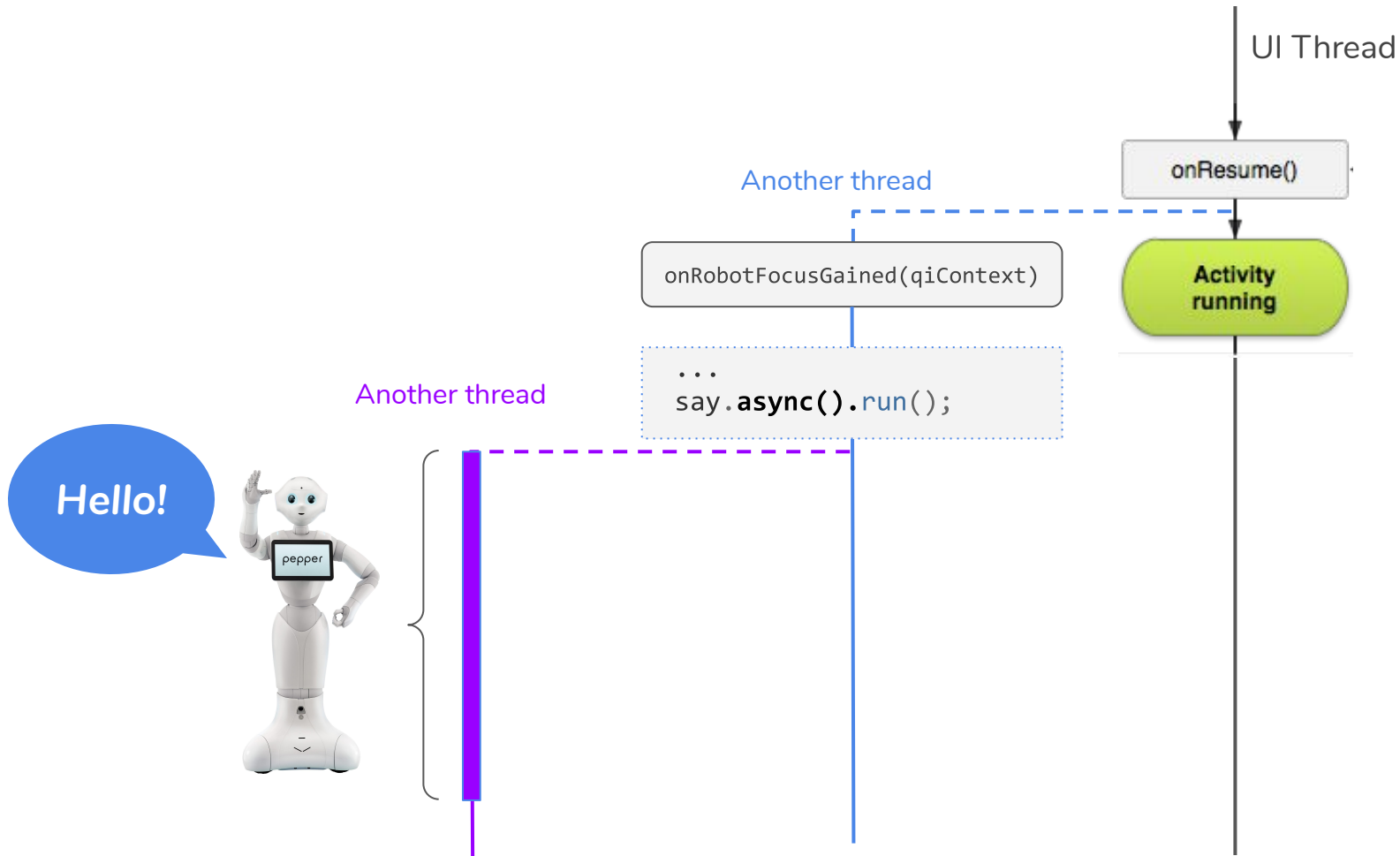
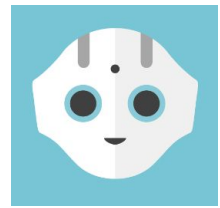
Action Synchronization



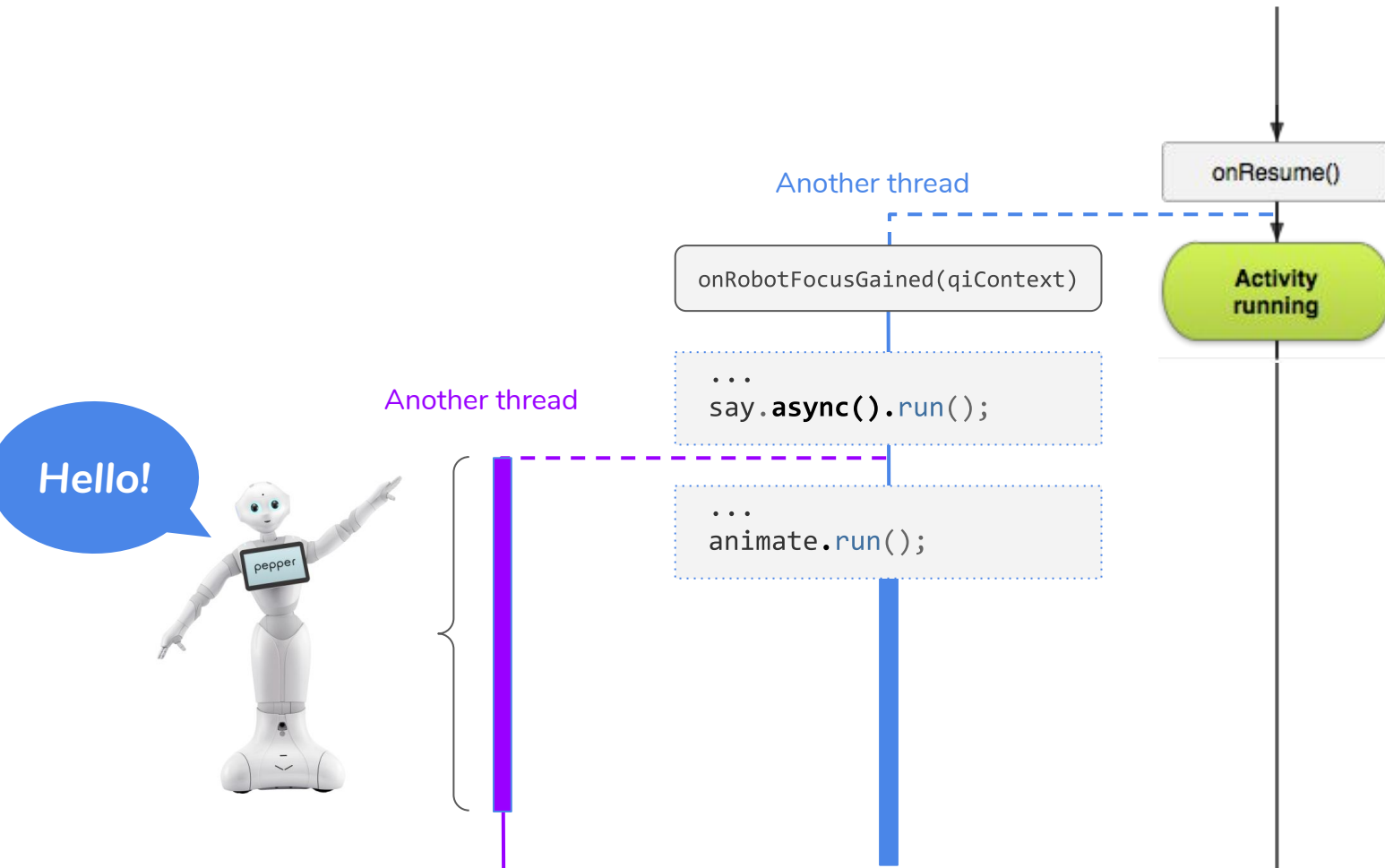
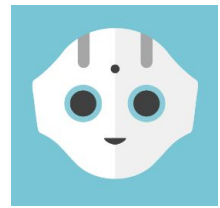
Action Synchronization



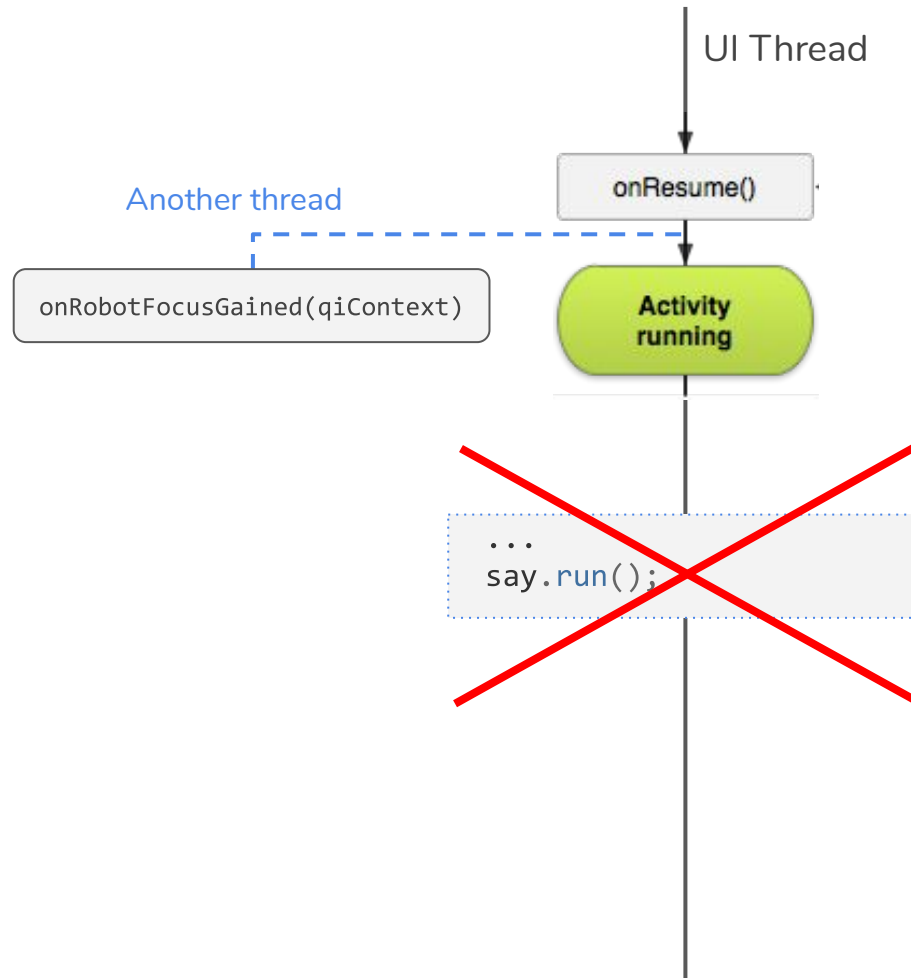
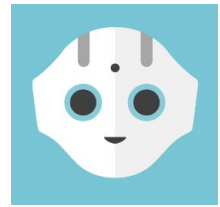
Action Synchronization



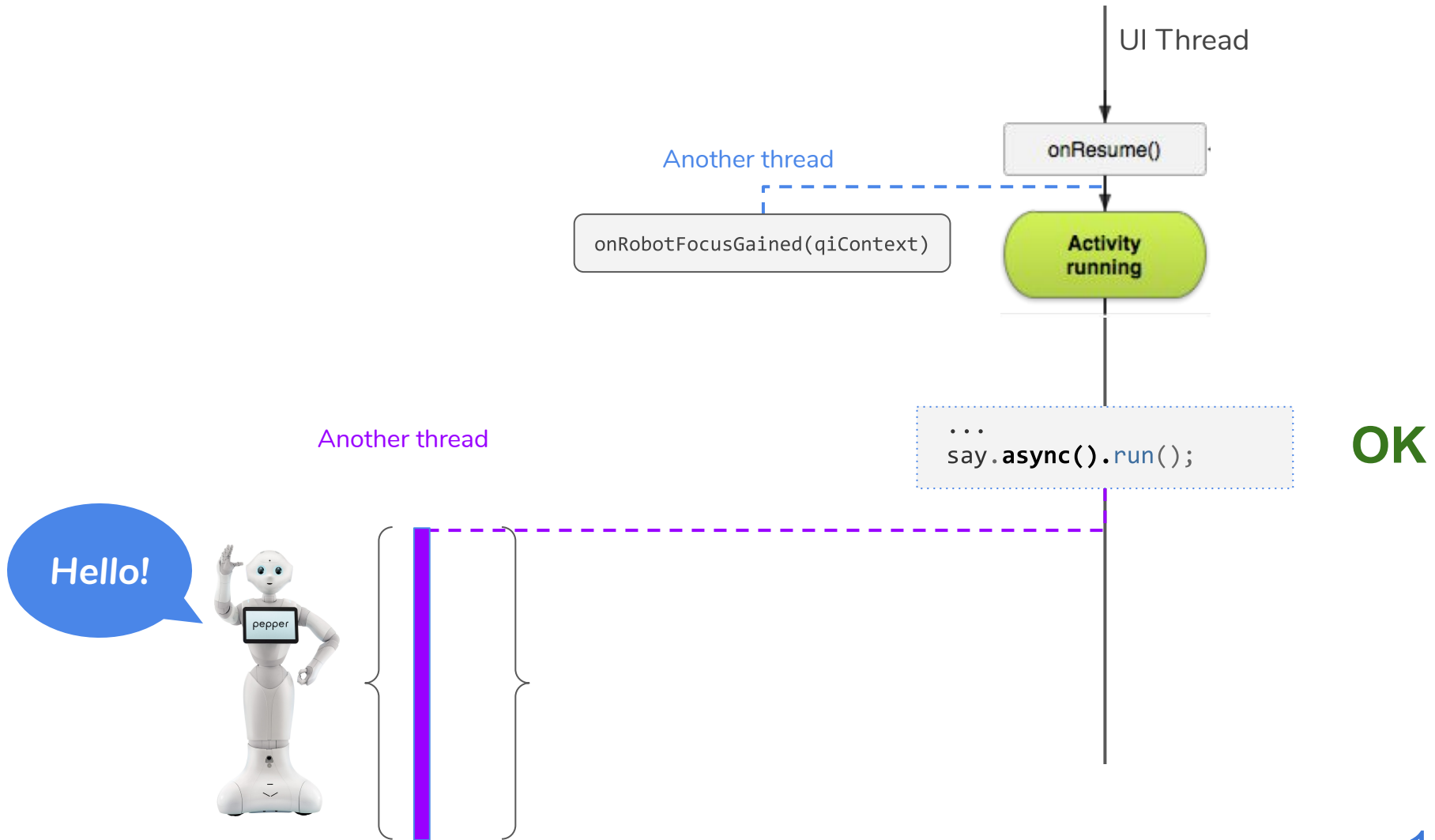
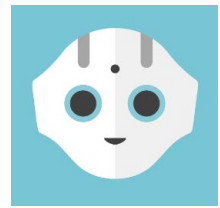
Action Synchronization



Action Synchronization

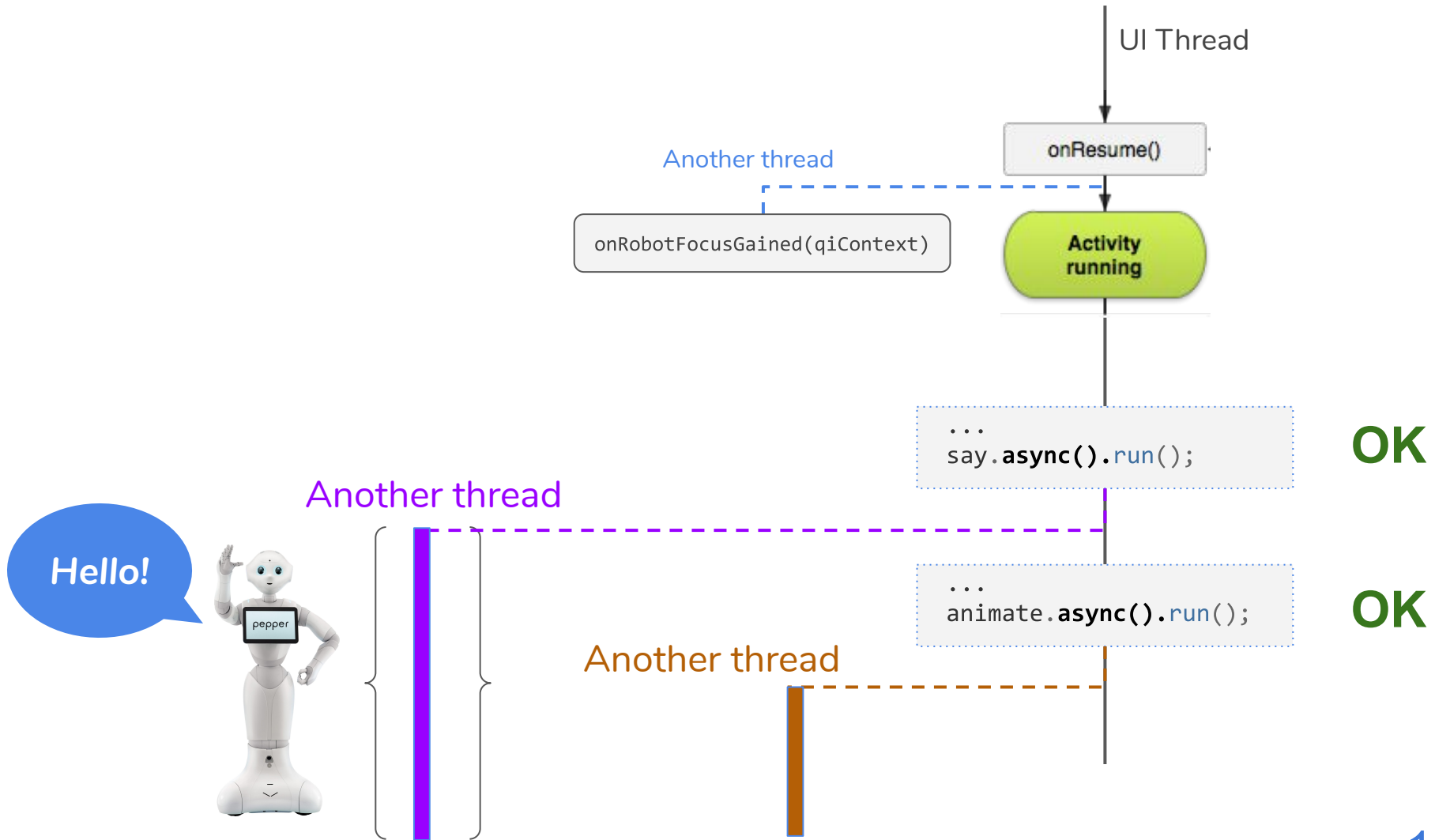
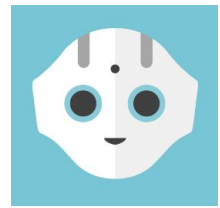


Action Synchronization

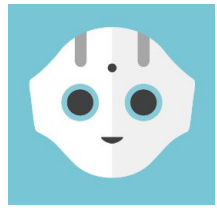


OK

Action Synchronization



Action Synchronization



Future objects: reference to running tasks that will return a value in the future

```
Future<Void> execFuture = say1Action.async().run();
```

```
execFuture.andThenCompose( ... );
```

```
execFuture.requestCancellation();
```



Action Synchronization

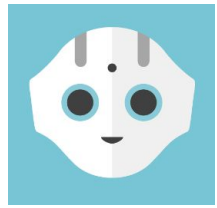
Future objects can be composed to define complex monitoring of action execution

Example: sequence of action execution

```
execFuture.andThenCompose( ... )  
    .andThenCompose( ... )  
    .andThenCompose( ... );
```

Next action is started after the previous one is correctly terminated.

Action Synchronization



Future objects can be used to monitor the action execution, for example to request the action to be canceled

```
execFuture.requestCancellation();
```

Current action (and all the next ones when using `andThenCompose`) are stopped.



Example: Action App

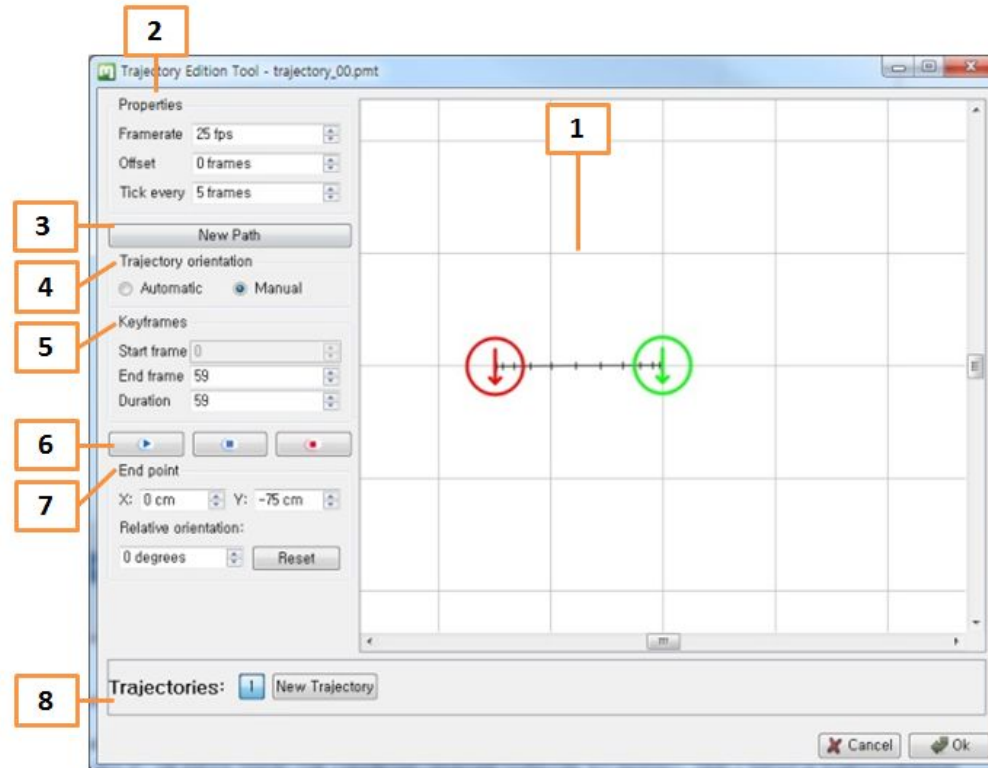
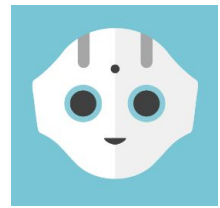
In this example we will define and run 3 kinds of actions

- Say
- Animation
- Trajectory

https://github.com/robocupathomeedu/rc-home-edu-learn-pepper/blob/master/test_activities/

Note: **Chat** is also an action (integrate it in this example as an exercise)

Trajectory editor



https://qisdsk.softbankrobotics.com/sdk/doc/pepper-sdk/ch3_tools/trajectory_editor.html



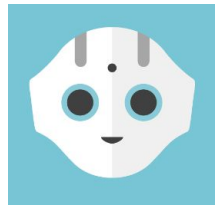
Action sequence

The main behavior of the robot is the sequence of 5 actions

```
execFuture = say1Action.async().run()  
    .andThenCompose( v -> gorillaAction.async().run())  
    .andThenCompose( v -> trajAction.async().run())  
    .andThenCompose( v -> gorillaAction.async().run())  
    .andThenCompose( v -> say2Action.async().run());
```

This behavior is started when we push the **START** button on Pepper tablet

Action sequence cancelation



The behavior of the robot is stopped (all the actions are cancelled) when we push the **STOP** button on Pepper tablet

```
execFuture.requestCancellation();
```

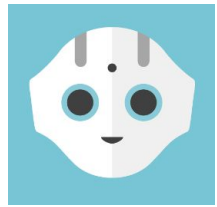

More documentation on Async



<https://developer.softbankrobotics.com/pepper-qisdsk/principles/synchronous-or-asynchronous>

<https://developer.softbankrobotics.com/pepper-qisdsk/principles/chaining-operations>

Sample code repositories



<https://github.com/robocupathomeedu/rc-home-edu-learn-pepper>

RoboCup@Home Education teaching material for Pepper 2.9 Android SDK course

<https://github.com/aldebaran/qisdk-tutorials>

QiSDK Tutorials is an Android application for Pepper the robot.

Developed using the QiSDK <https://developer.softbankrobotics.com/pepper-qisdk/>

This application provides an easy access to the tutorial sample codes.

How to deliver



Push on github

How to to use github from android studio example

<https://medium.com/code-yoga/how-to-link-android-studio-with-github-312037a13b99>



Summary

01 Introduction

02 Pepper and Software Installation

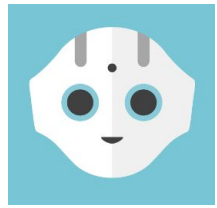
03 Apps Programming

04 Dialogues

05 Examples

06 Advanced Programming

Assignment

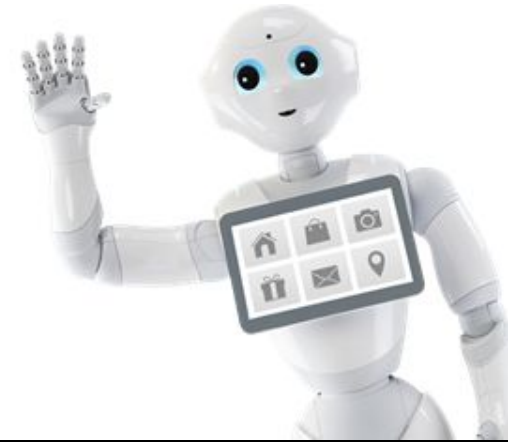
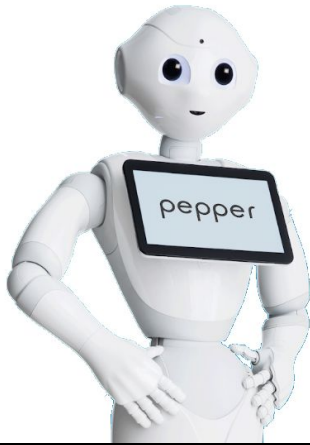


Join RoboCup@Home Education Online Challenge 2020!

- Online Entry Form: <https://forms.gle/UBREeC1xTCVQ9wr78>
- Online Entry Form (backup): <https://www.wjx.cn/jq/72082120.aspx>

Important Dates

- Entry Application: April 1 ~ June 10, 2020
- Online Classroom: April 16 ~ May 21, 2020
- Submission of review materials for video support: June 1, 2020
- Due of Technical Video Challenge Materials Submission: June 10, 2020
- Technical Video Challenge Review: June 10 ~ 15, 2020
- Online Challenge: June 24 ~ 28, 2020



RoboCup@Home Education

ONLINE CHALLENGE 2020

Online Classroom Standard Platform

Web: <https://www.robocupathomeedu.org/challenges/robocuphome-education-online-challenge-2020>

Online Classroom: <https://www.robocupathomeedu.org/learn/online-classroom/online-challenge-2020>

Online Entry Form: <https://forms.gle/UBREeC1xTCVQ9wr78>

Online Entry Form (backup): <https://www.wjx.cn/jq/72082120.aspx>

Contact: oc@robocupathomeedu.org

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