THE MAERSK MC-KINNEY MOLLER INSTITUTE

Mandatory Exercise 2 and LUA

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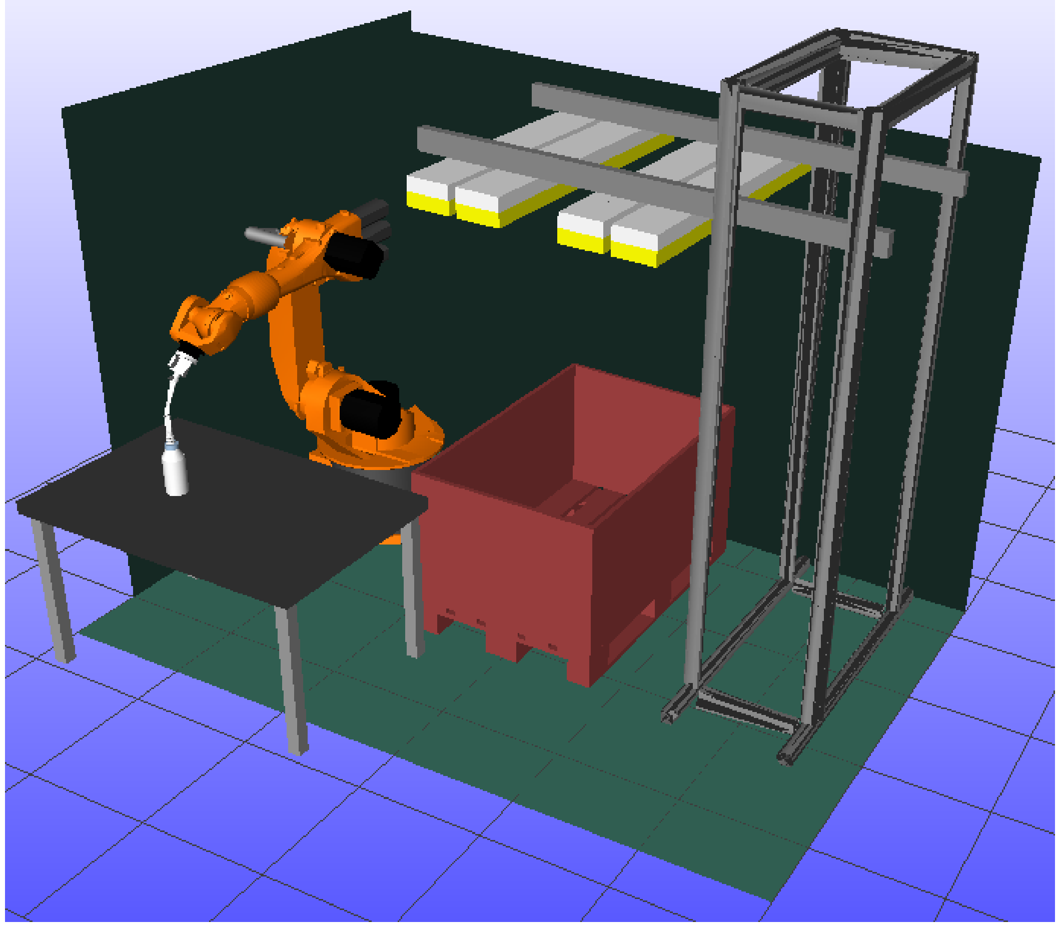
Pathplanning



- To solve the exercise:
  - Make path planning and calculate statistics
  - Extend the *pathplanning.cpp* file
  - Use the workcell *Kr16WallWorkCell.*
  - Create a function which exports the configuration path (QPath) to LUA
  - Run the LUA script in RobWorkStudio to visualize the path

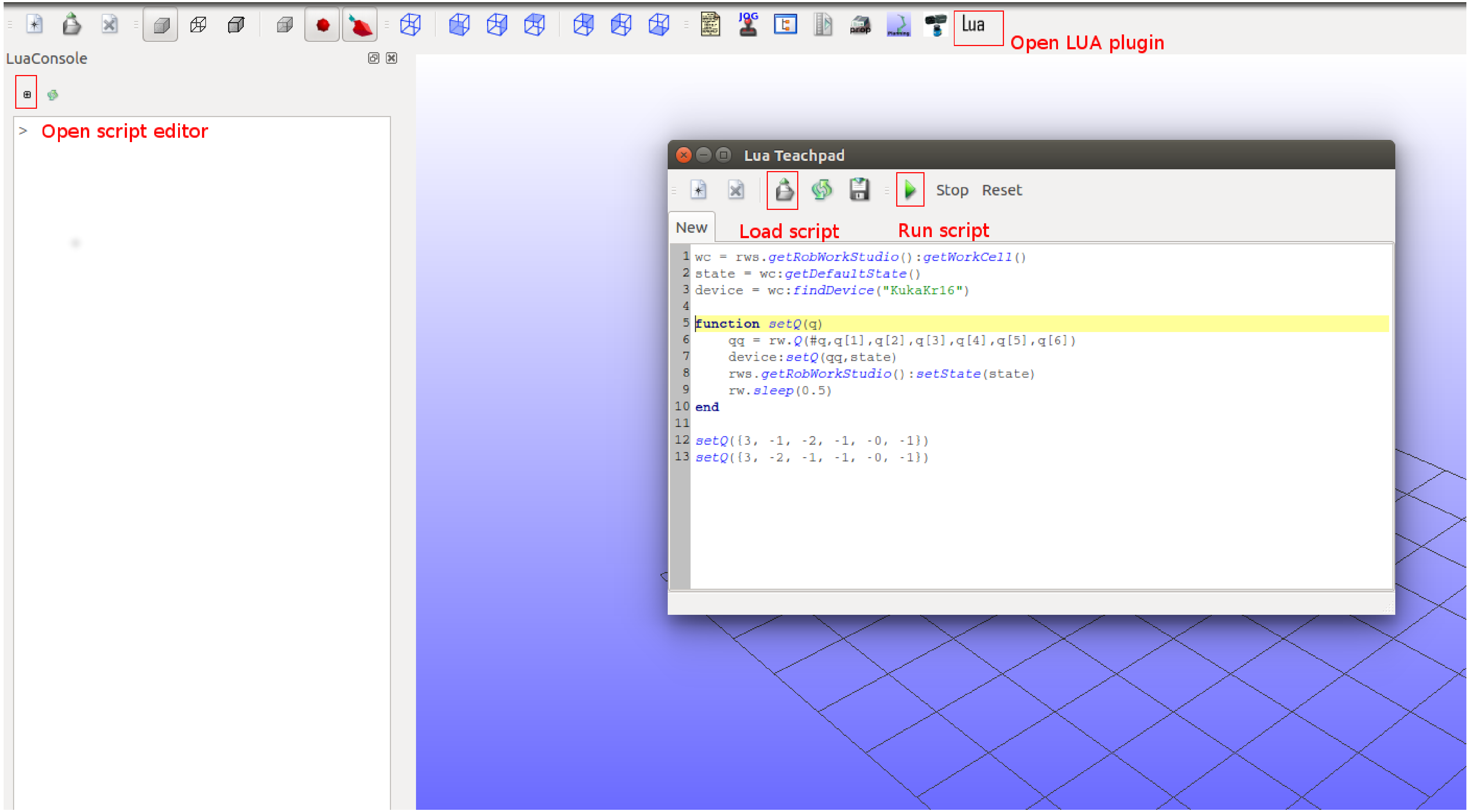
LUA

- LUA is a scripting language used in RobWorkStudio to visualize movement

- You can attach objects to robot frames.

- Kinematic movements (discrete path)

Using LUA



Open LUA plugin

Open script editor

Load script

Run script

```
wc = rws.getRobWorkStudio():getWorkCell()
state = wc:getDefaultState()
device = wc:findDevice("KukaKr16")

function setQ(q)
    qq = rw.Q(#q,q[1],q[2],q[3],q[4],q[5],q[6])
    device:setQ(qq,state)
    rws.getRobWorkStudio():setState(state)
    rw.sleep(0.5)
end

setQ({3, -1, -2, -1, -0, -1})
setQ({3, -2, -1, -1, -0, -1})
```

Basic Script

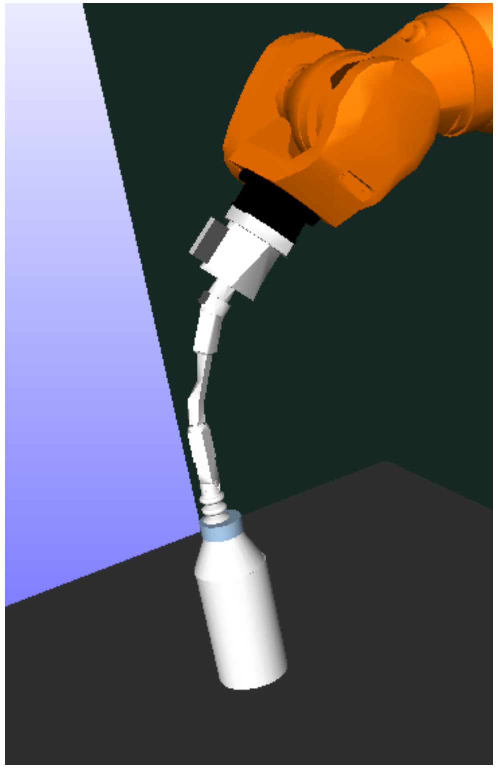
-
  ```
  wc = rws.getRobWorkStudio():getWorkCell()
  state = wc:getDefaultState()
  device = wc:findDevice("KukaKr16")

  function setQ(q)
        qq = rw.Q(#q,q[1],q[2],q[3],q[4],q[5],q[6])
        device:setQ(qq,state)
        rws.getRobWorkStudio():setState(state)
        rw.sleep(0.5)
  end

  setQ({3, -1, -2, -1, -0, -1})
  setQ({3, -2, -1, -1, -0, -1})
  ```

Grasping the Bottle

- Grasping the Bottle in CPP and LUA:
  - See *Kinematics::gripFrame()* in API
  - Remember to set the *state* (*rw::kinematics::state*)
- Remember
  - The *PlannerConstraint* needs to be constructed with a *state*.
  - If you change the state after you constuct the *PlannerConstraint*, it needs to be reconstructed along with the *QToQPlanner*.



Repeatability of results

- The RRT planner is probabilistic (uses a random generator)
- In order to get different results each time set the seed with:
  - *rw::math::Math::seed(),* which uses the current date, or
  - *rw::math::Math::seed(int),* which uses the int as a seed
- The seed should be set at the start of the program