Robot Behaviour Programmierung in URBI – Tipps und Tricks

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Neues walk device in URBI!

Release 0.9.8

This new release of URBI which is now compatible with ERS7-M3 robots includes two new main components:The new 'walk' device than enables a new walk coming from the **robocup**!

Here is a short description of the 'walk' device:

position control:

    walk.go(distance) : walk forward or backward meters
    walk.turn(angle) : turn degrees
    walk.side(distance) : sidestep meters
    walk.goto(y,x, theta) : combine the three previous functons

  These functions block until move is terminated or interrupted by a new move command.

Neues walk device

speed control:

walk.speedforward(), walk.speedbackward(),
walk.speedleft(), walk.speedright(),
walk.speedsideleft(), walk.speedsideright()
  will move in the given direction at speed defined in walk.speed (between 0 and 1)

walk.speed(speed), walk.speedturn(speed) and walk.speedside(speed) will make the
corresponding move, but at the signed speed passed as their parameter.

These functions can be mixed: the orders are averaged with each other.
These functions never stop: use tags, or stopif

odometry: the variables walk.x walk.y and walk.theta contains the position of the robot relative
  to its start position. The variables can be reset to 0 by calling walk.reset()

Walk

<u>Simple walk:</u>

Using an original walk from the robocup, we extracted the two main **Fourier coefficients** for each joints. With **blend = add** mode, these two components are added on each joint to reproduce the original periodic oscillation:

```
def robot.walk(duration)
{
  echo "go for " + string(duration) + " secs";
  direction = 1;
  if (duration <0) {
    duration = - duration,
    direction = -1
  };

  walk: timeout(duration) {
    for &(x=1;x<=2;x++)
      for &(y=1;y<=2;y++)
        for &(j=1;j<=3;j++)
          for &(d=1;d<=2;d++)
            robot.leg[x][y][j] = walk.mean[x][j]
                    sin:walk.speed*walk.coef[d]
                  ampli:walk.amp[x][j][d]*4
                phase:direction*walk.phase[x][y][j][d]+pi*(direction-1)/2
  }
};
```
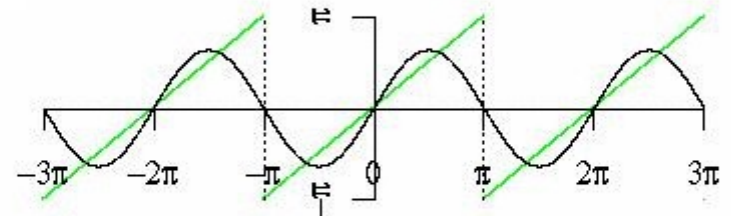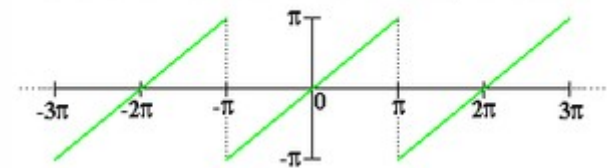
Fourier Reihen

$$f(t) = \frac{a_0}{2} + \sum_{n=1}^{\infty} \left[a_n \cos(\omega_n t) + b_n \sin(\omega_n t) \right],$$
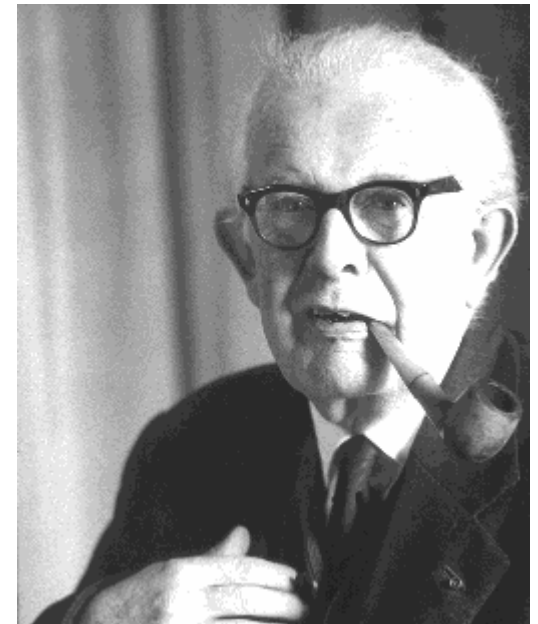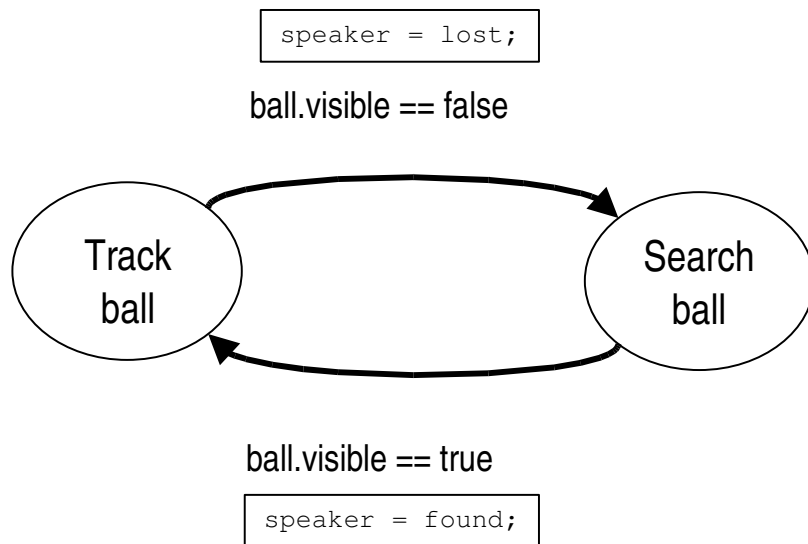
das gleiche in Exponential Schreibweise:

$$f(t) = \sum_{n=-\infty}^{+\infty} c_n e^{i\omega_n t}$$

Periodic version of the identity function

Periodic version of the identity function

Behaviour Graphs

```
speaker = lost;
```

ball.visible == false

Track
ball

Search
ball

ball.visible == true

```
speaker = found;
```

Jean Piaget wurde am 9. August 1896 in Neuenburg geboren und verschied am 16. September 1980 in Genf.