

Real Time Systems (1DT004), 10 credits

-and-

Real Time Systems I (1DT063), 5 credits

(Students taking 1DT063 attend a subset of the lectures
and labs taken by the students in 1DT004)

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Real Time Systems (1DT004), 10c -and- Real Time Systems I (1DT063), 5c

Real time systems are timing-critical systems with high requirements on safety and correctness.

They are not always fast, but must always be *predictable*.



Real Time Systems (1DT004), 10c -and- Real Time Systems I (1DT063), 5c

Classic course structure:

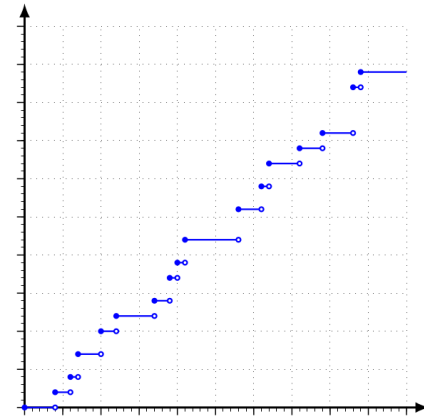
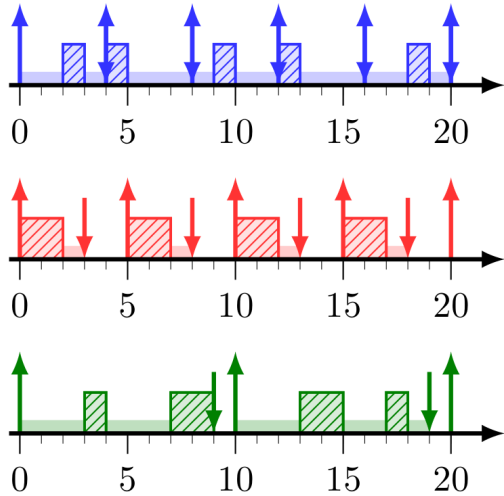
- Lectures
- Four (or two) lab assignments
→ *in groups*
- Written exam



Theory

Significant parts of the course are theoretical and cover, for example, the theory of scheduling (both course versions) and verification of timed automata (only 10c version).

$$\lim_{n \rightarrow \infty} n(2^{\frac{1}{n}} - 1) = \ln(2) \approx 0.693$$



$$\text{dbf}(\tau_i, t) = \max\left(0, \left\lfloor \frac{t - D_i}{T_i} \right\rfloor + 1\right) \cdot C_i$$

$$\text{dbf}(\mathcal{T}, t) = \sum_{\tau_i \in \mathcal{T}} \text{dbf}(\tau_i, t)$$

Lab assignments

Lab 1

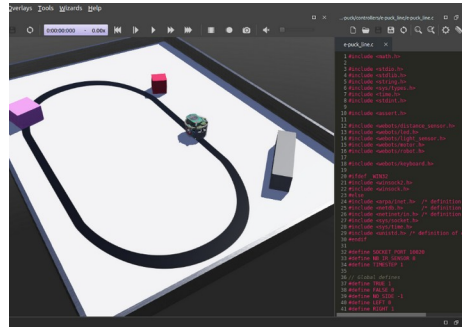
Ada programming



```
1 -- Declaring a task
2 task My_Task is
3   --entry calls declarations
4 end My_Task;
5
6 -- Defining a task body
7 task body My_Task is
8   -- local declarations
9   begin
10    -- code of the entry calls
11 end My_Task;
```

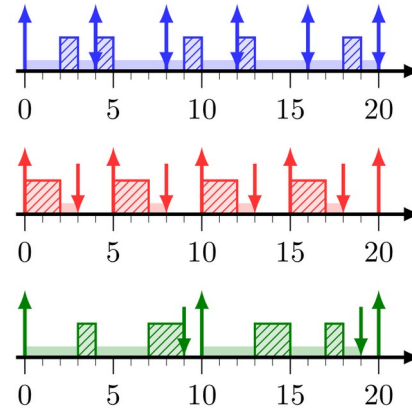
Lab 2

Line-following
virtual robot
programmed in Ada
(only 10c version)



Lab 3

Scheduling
theory



Lab 4

Verification of
Timed Automata
(only 10c version)

