

## TTIT62 Real-time Process Control

### Lecture 10: Summary & applications

**Simin Nadjm-Tehrani**

Real-time Systems Laboratory

Department of Computer and Information Science  
Linköping university



### What have we covered?

- How to model computational processes
- Methods for sharing CPU and guaranteeing that each instance of each process gets a predictable share
- Methods for sharing resources other than CPU, and reasoning about deadlocks and response times
- Basics of dependable systems, and availability performance trade-offs
- Now: where are you likely to see this stuff?



### Application areas

- Embedded systems:
  - Need to reason about resources since they are limited
- High-assurance systems:
  - Need to operate predictably even in presence of faults and errors



### Selected Masters projects

- Predicting system load in Night Vision system II at Autoliv
  - Measuring highest load for processes in an obstacle avoidance system that uses video streams from an IR camera
- Implementing memory protection in a minimal OS
  - Demands by the car industry standard AUTOSAR on real-time OS transformed to an MMU for OSEck (OS at ENEA)



### Selected Masters projects

- Load balancing SIP-enabled firewalls
  - How to manage 100s of simultaneous IP telephony calls by managing multiple registrars
- Load management for a telecom charging system
  - Modelling the CPUs and threads that manage calls to a prepaid charging system in order to study its behaviour bottlenecks during overloads



### Currently at RTSLAB

- Networking in disaster scenarios:
  - Implementing an energy-aware manycast protocol for adhoc networks on various platforms (Linux, Android, later: Windows mobile, Symbian)
- Earlier years: Two years in a row LiU students won best Masters thesis prize in the real-time area nationally
  - 2002: Load control 3G Radio Network Controller

