



FAKULTÄT FÜR
INFORMATIK

Distributed and Operating Systems Group

Advanced Operating System Issues (AOSI)

Practical Exercise Sheet 3

Due date: 24.10.2013

1 Practical task 3

The third practical task is the implementation of a forest fire detection system. To support the development a basic project is available at <http://eos.cs.ovgu.de/wp-content/uploads/2013/01/ForestFire.zip>. It contains the forest fire simulation as source code. This can be compiled by calling `make`. However before the first compilation the installation path of FAMOUSO must be inserted in the make file. Also contained is a simple example application reading all the sensor values and printing them on the screen.

The used middleware FAMOUSO can be downloaded via <http://famouso.sourceforge.net>. It is a publish/subscribe middleware to provide event-based communication on heterogeneous networks. In this task however only local events are used. To start the simulation as well as the sensors an event-channel handler needs(ECH) to be active. The different ECHs can be found in the FAMOUSO installation in the folder ECH. It is best to use the local `ech`. If simulation and detection program should run on different machines the `ech-udp-mc` is a good choice.

To detect fires in the simulated forest it is necessary to fetch the sensor values from the different simulated sensors. Each sensor has a fixed position and measure the local temperature. Some of the sensors provide periodic updates with a frequency of 1Hz. Other however only publish update whenever the value changes by more than 10K. After fetching the sensor data it is necessary to correlate the different temperature reading and their position to evaluate possible fires.

The simulated fires can ignite with a defined ignition probability in each simulation step(1s). The fire afterwards burns and increases its heat up to $800^{\circ}C$. After this it cools down until $100^{\circ}C$. If a fire is colder than $100^{\circ}C$ it is not considered a fire anymore and will die.