

Motivation

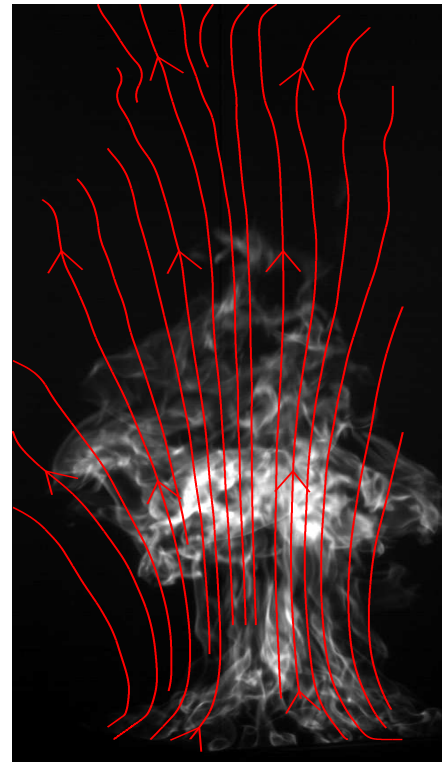
The aim of the project is the development of an 'intelligent' flame detection system,

- capable of recognising flames automatically by their dynamic characteristics,
- and being an add-on feature to usual, already installed surveillance video-systems.

Therefore analyses into the motion of flames have been carried out for different test-fires and nuisance scenarios.

Conventional motion analysis

A direct analysis of the images of a video sequence. Motion is plotted as stream lines. However, due to the fast movements of flames this type of analysis is only successful in high speed images.



Techniques

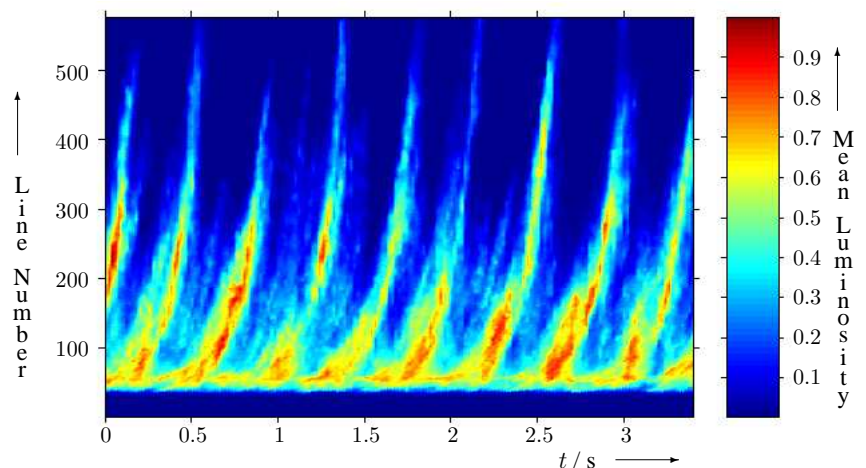
For the analyses two different techniques have been applied:

- A conventional 'block-based' motion estimation, adapted on flame tracing
- A specially developed simplified motion analysis, where images are reduced to vectors by mean calculation of the luminosity in each frame line.

Simplified motion analysis

Applicable on sequences recorded by usual video-cameras.

The analysis of turbulent flames results in a periodic pattern due to the flickering frequency of the flame. The parabolic shape of the pattern is an indication for the accelerated movement of the rising flame balls.



Evaluation of a n-heptan pool-fire (TF5)