Imaging Food Quality

Imaging and spectroscopy have long been established methods for food quality control both in the laboratories and online. An ever increasing number of analytical techniques are being developed into imaging methods and existing imaging methods to contain spectral information. Images and especially spectral images contain large amounts of data which should be analysed appropriately by techniques combining structure and spectral information.

This dissertation deals with how different types of food quality can be measured by imaging techniques, analysed with appropriate image analysis techniques and finally use the image data to predict or visualise food quality.

A range of different food quality parameters was addressed, i.e. water distribution in bread throughout storage, time series analysis of chocolate milk stability, yoghurt glossiness, graininess and dullness and finally structure and meat colour of dry fermented sausages. The imaging techniques ranged from single wavelength images, multispectral to hyperspectral images. The effect of different light geometries were utilised in measuring the light reflection of yoghurt surfaces.

What the best imaging technique for a given problem is, should be addressed by visually evaluation of a detectable difference between known samples. While doing image analysis, it was found to be advantageous to combine several small models. The combined model was used for extraction of object relevant information, i.e. spectral, texture or size. The data extracted was used for explorative or predictive data analysis.