

do this by detecting crowd noises and the excitation level of the commentator, head and shoulder shots of players, action replays, changes on the scoreboard, and where the camera is pointing. If you get the combination of a very excited commentator, a change in the score, an action replay, and an excited crowd, that's a likely indicator that something important has happened."

A day in the life...

From the roar of the crowd to the daily humdrum of life, SenseCam, as developed by Microsoft Research, takes pictures by default about every 50 seconds, triggered by a range of built-in sensors. The picture quality is not as good as a mobile phone, and you can store twenty days worth before downloading to your PC for viewing. On an individual basis they are not great quality photographs – but if you stick them all together and show them very fast as a movie you get a better view of what is happening. Being able to capture this information is great but it's an inelegant way to watch your day.

The device is a solution looking for a problem, and that's why Microsoft released SenseCams to groups like AIC, who already proven expertise in image processing, to develop technologies which would make it more usable. "We are applying our technology to taking a day's SenseCam

images and dividing them up into logical events that are much more digestible. For each image we pull out descriptors like colours and textures and we compare similarities between each image and each adjacent image e.g. (indoors versus outdoors, far away versus near). In combining this we segment an entire day into different events using the visual appearance."

Another approach they are taking is to extract features from each image, and detect different levels of events from a day, and grouping them into bigger events. The morning at work event might include desk time, lab time and meetings. "We detect events that are similar across the days and group them together. We then generate a summary of the week where the unusual events get more prominence and more regular events get less prominence."

An obvious application is for Alzheimer patients. AIC is working with the Alzheimer Association and getting feedback.



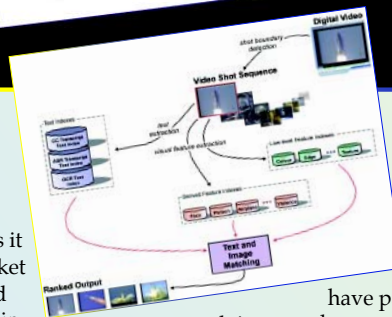
Research cocktail

The wonderful thing about digital technology is that it crosses many disciplines, spreading as it does like an omnipresent blanket over our lives. The SFI-funded Adaptive Information Cluster in DCU is running with this theme, allowing "an unusual cocktail of chemists, engineers and computer scientists to do some unusual, far out research", according to Alan Smeaton, Professor of Computing and founding director of the Centre for Digital Video Processing (CDVP) at Dublin City University.

A heady cocktail

His diverse research projects offer the universal accessibility of historic manuscripts and artifacts, bespoke highlights of your favourite field games, or video diaries that generate a summary of your week. The CDVP is part of the Adaptive Information Cluster, and this research is carried out within that framework. For Smeaton, AIC has created a critical mass that sucks in other activities. AIC is in the enviable position of obtaining outsourced project work from Google and Microsoft. The Google project is particularly pleasing for Smeaton. With a quest almost on a par with finding the Holy Grail, Google wants to make all information in the world searchable. In a rare move it ventured beyond its corporate citadel and outsourced some of the research. AIC was chosen because it has internationally recognised expertise in video analysis and has applied it to making images of handwriting searchable.

The aim of the "no strings attached" funded research is to make old manuscripts and rare historical documents available and searchable on the web. "One of the techniques we use is to match the shape



of an object against another shape, and we have developed a very clever algorithm to do this, which we

have patented. We are now applying our shape matching to matching the shape of words against other words. Every time we handwrite it's different, and our algorithms can detect these variations in shape." The method is suitable for anything after the 17th century that is cursive (joined up script), and AIC researchers have used the handwriting in George Washington's diary with good results. But high volume material that's not high profile like births, deaths and marriages records are a special target.

AIC also has an interesting project with the National Museum of Ireland that allows you to take a picture of a priceless artifact like the Ardagh Chalice and create a 3D model of it using dozens of images. "Far cheaper than laser technology, all the clever stuff is done in the software. We stitch the images together in a way that allows scholars and archeologists to discover if the relief work on one artifact appears on other artifacts." With this kind of cheap technology a large digitized database can be created, with only the priceless artifacts being laser scanned.



The big match

With the patented Automatic Sports summarization, AIC has developed a technique to take a field sport in digital form and automatically generate highlights of whatever length you want, giving you the most highlighted highlights, or all of the exciting events. It can automatically detect goals, points, sending offs etc. "We