Intelligent Image Processing Techniques for Structuring a Visual Diary

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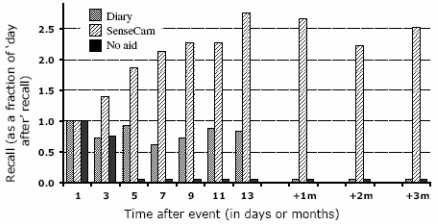
SENSECAM

- Developed by Microsoft Research Cambridge
- Captures an image at least once every 50 seconds
- Intelligently takes pictures based on inbuilt sensors: Passive Infra-Red, Light Level
- Sensor data logged every 2 seconds: Temperature, Movement, Light level, Passive Infra-Red, Battery level
- 119 degrees wide-angle lens, 1GB memory, expansion port to allow connection with devices like Bluetooth module, extra camera, GPS device, heart-rate monitor

- An initial study shows that repeatedly viewing SenseCam images of an event dramatically improves recall
- Study carried out on a subject with limbic encephalitis, a neurodegenerative disease
- Graph shows % of events that subject remembers after reviewing SenseCam images to differing degrees

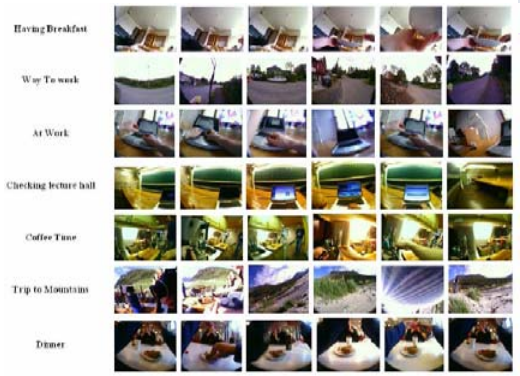


Hodges, et. al. SenseCam: A Retrospective Memory Aid. To appear in The Eighth International Conference on Ubiquitous Computing, September 17-21, 2006.

CHALLENGE

- Large amounts of images captured
- Fish eye lens
- 3,000/day; 20,000/week; 90,000/month; >1 million/year
- A need to provide a visual summary of one's day/month/year

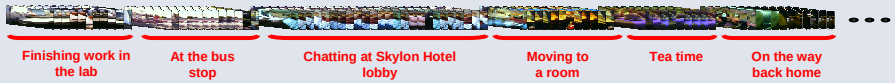
- Users will only want to review landmark images, not thousands of breakfast or working on PC
- On the day featured, events such as breakfast, work, coffee, etc. are normal everyday events
- A user would prefer to have more uniquely occurring events such as 'Trip to Mountains' emphasised much more greatly than routine events



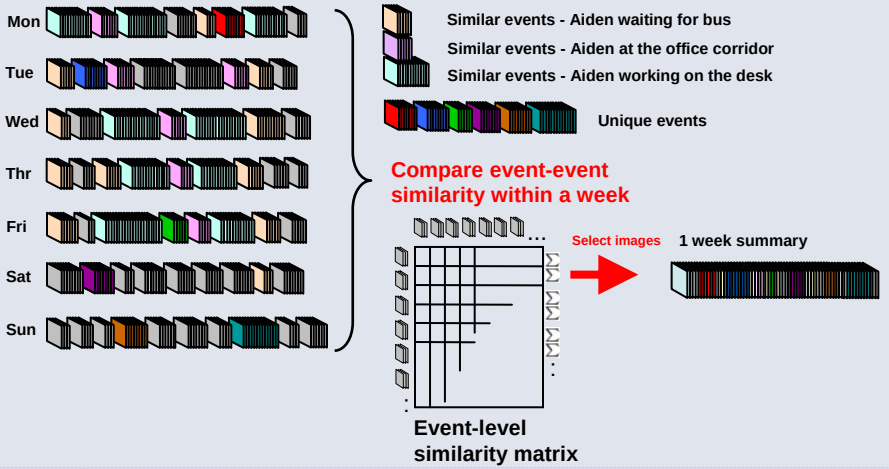
Manually annotated events from a typical day of SenseCam images

APPROACH

Multiple images segmented into events



Event-segmented image sets



Example images from landmark events

FUTURE WORK

- Gather more data from more users
- Consider other sources of information: Audio (Voice recording of whole day), Location (GPS), Biometric (Heart rate)
- Attempt to classify events e.g. conversation, working, eating, social event, etc.
- Investigate sophisticated fusion techniques

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