NTCIR14-Lifelog3

Task Overview

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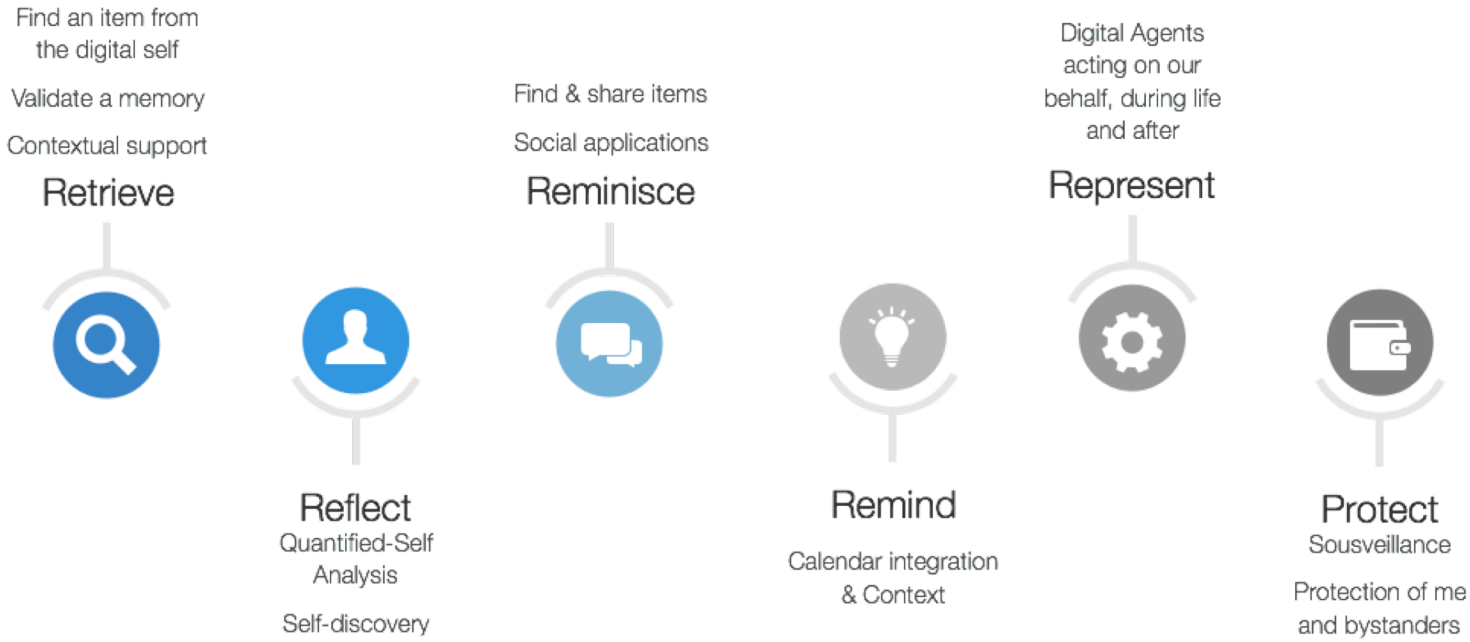
Life Experience

Digital Self

How to create a digital lifelog of life experience without manual input… activities, experiences, interactions, emotions? … **and make it useful…**

Reasons for Lifelog Analytics



Lifelog-3 Overview

The third of three lifelog tasks at NTCIR.

New rich data (43 days, 2 people), fully anonymised in a semi-automated process

Three sub-tasks:

- **LSAT** - Lifelog Semantic Access Task
- **LIT** - Lifelog Insights Task
- **LADT** - Lifelog Activity Detection Task

IMAGE AS THE UNIT OF RETRIEVAL

01

Wearable Multimedia

1,500 images per day from the Narrative wearable camera. Accompanying concept annotations. Periodic audio. Manual photos captured. Music listening history.

02

Human Biometrics

24x7 heart rate, galvanic skin response, calorie burn, steps, skin temperature. Daily blood glucose level & blood pressure. Weekly cholesterol and uric acid measurements.

03

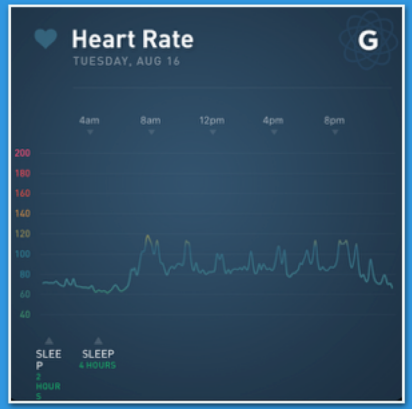
Information Access

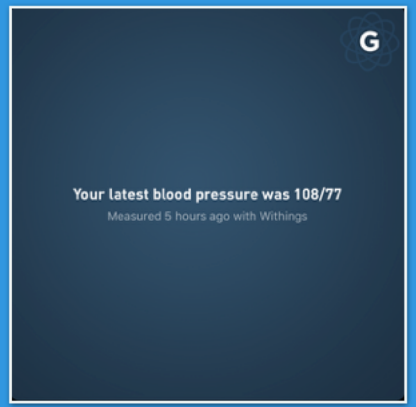
Onscreen reading, keystrokes on keyboard, mouse movements, computer activity, web pages viewed.

04

Human Activity

Physical activities (walking, running, transport, etc..), locations visited, food eaten, mood.





Blood Pressure, glucose.

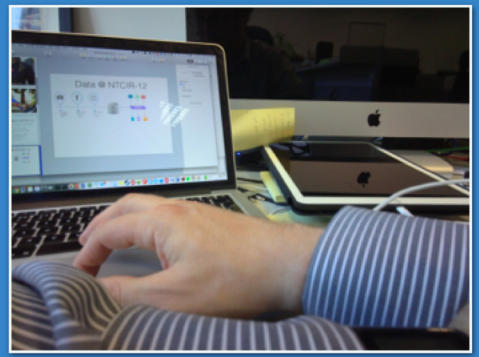
24x7 heart rate & GSR, calorie burn, steps.

Wearable camera data from Narrative Clip 2 (1,500 per day).

Manual Photos

Periodic Audio

Music listening records

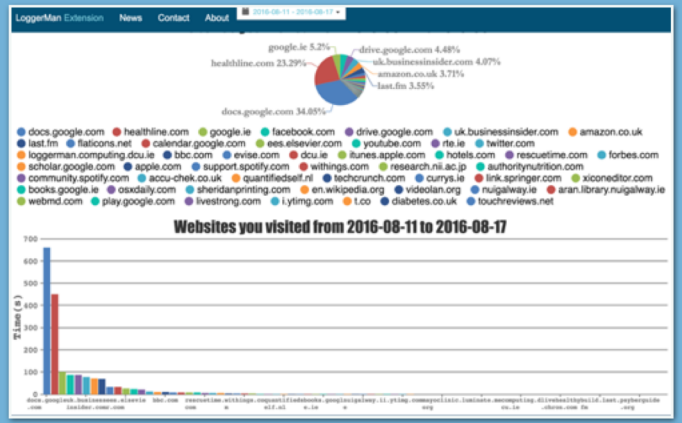


Words written and read, grouped into minute-long documents with TFs.

Mouse movements.

Web pages browsed.

Computer activity.

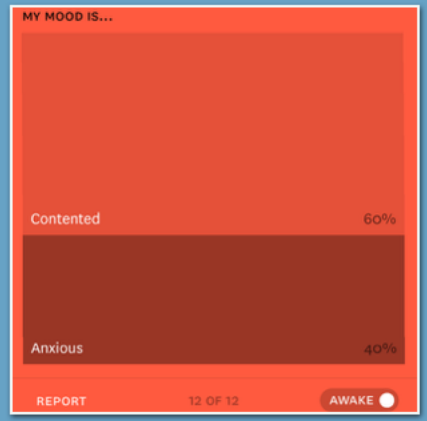


Physical activities

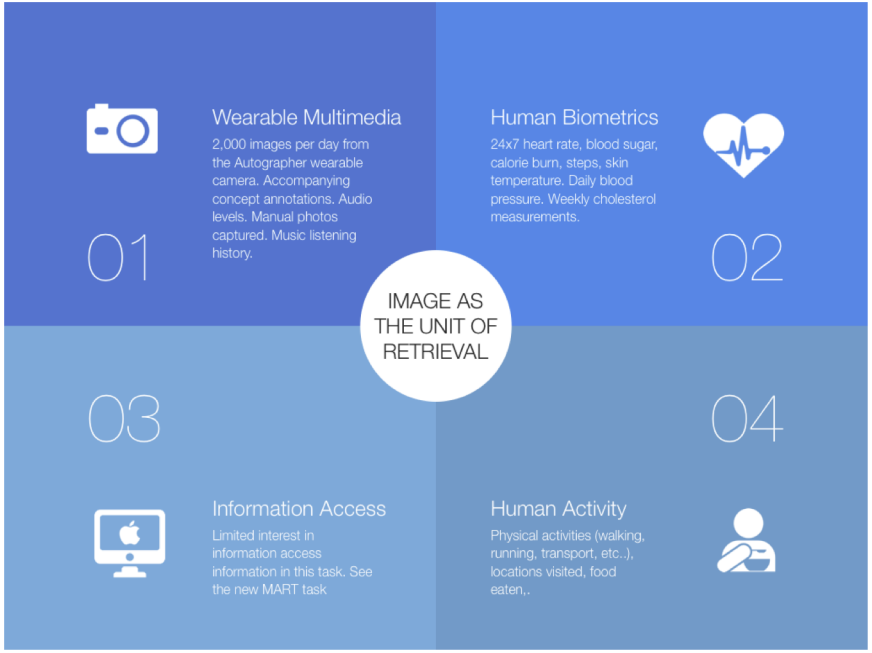
Locations

Food eaten

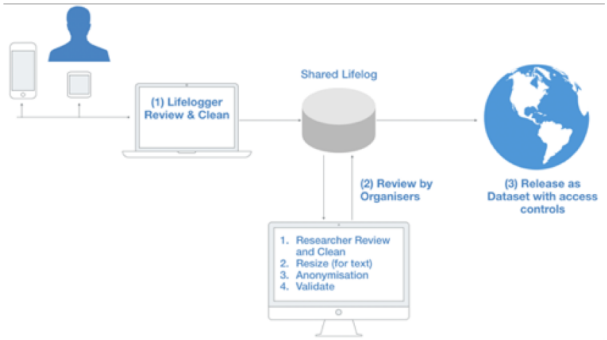
Mood



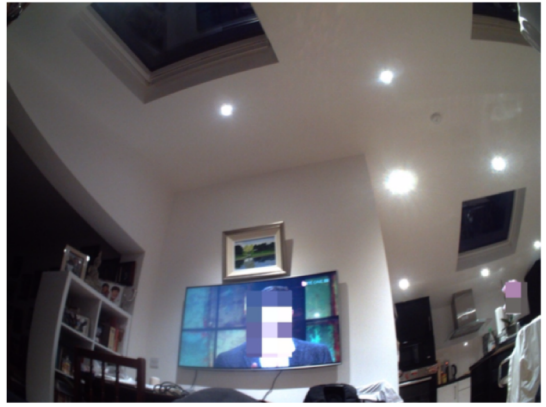
Lifelog-3 Data (smaller but richer)



Number of Lifeloggers	2
Number of Days	43 days
Size of the Collection	14 GB
Number of Images	81,474 images
Number of Locations	61 semantic locations
Number of LSAT Topics	24 topics
Number of LADT Types	16 activities




New!
Tough Runners Do!
foyleside
SANDWICH CO



LSAT Sub-task

A known-item search task in which participants have to retrieve a number of specific moments in a lifelogger's life. We define moments as semantic events, or activities that happened throughout the day. LSAT can be undertaken in an interactive or automatic manner.

TITLE: Ice Cream by the Sea
DESCRIPTION: Find the moment when U_1 was eating ice cream beside the sea.
NARRATIVE: To be relevant, the moment must show both the ice cream with cone in the hand of u1 as well as the sea clearly visible. Any moments by the sea, or eating an ice cream which do not occur together are not considered to be relevant.
EXAMPLES OF RELEVANT IMAGES FOUND BY PARTICIPANTS"

LSAT Topics (24)

Ice cream by the Sea
Eating Fast Food
A New TV
Going Home by Train
Photograph of a Bridge
In a Toyshop
7* Hotel
Buying a Guitar
Empty Shop
Card Shopping
Croissant & Coffee
Scone for Breakfast

Cooking a BBQ
light Check-in
Mirror
Meeting with a Lifelogger
Seeking Food in a Fridge
Car Sales Showroom
Watching Football
Coffee with Friends
Dogs
Eating at the desk
Walking Home from Work
Crossing a Bridge

LSAT Results (overview paper for details)

Group ID	Run ID	Approach	MAP	P@10	RelRet
NTU	NTU-Run1	Automatic	0.0632	0.2375	293
NTU	NTU-Run2	Interactive	0.1108	0.3750	464
NTU	NTU-Run3	Interactive	0.1657	0.6833	407
DCU	DCURun1	Interactive	0.0724	0.1917	556
DCU	DCU-Run2	Interactive	0.1274	0.2292	1094
HCMUS	**HCMUS-Run1**	**Interactive**	**0.3993**	**0.7917**	**1444**
QUIK	QUIK-Run1	Automatic	0.0454	0.1958	232
QUIK	QUIK-Run2	Automatic	0.0454	0.1875	232

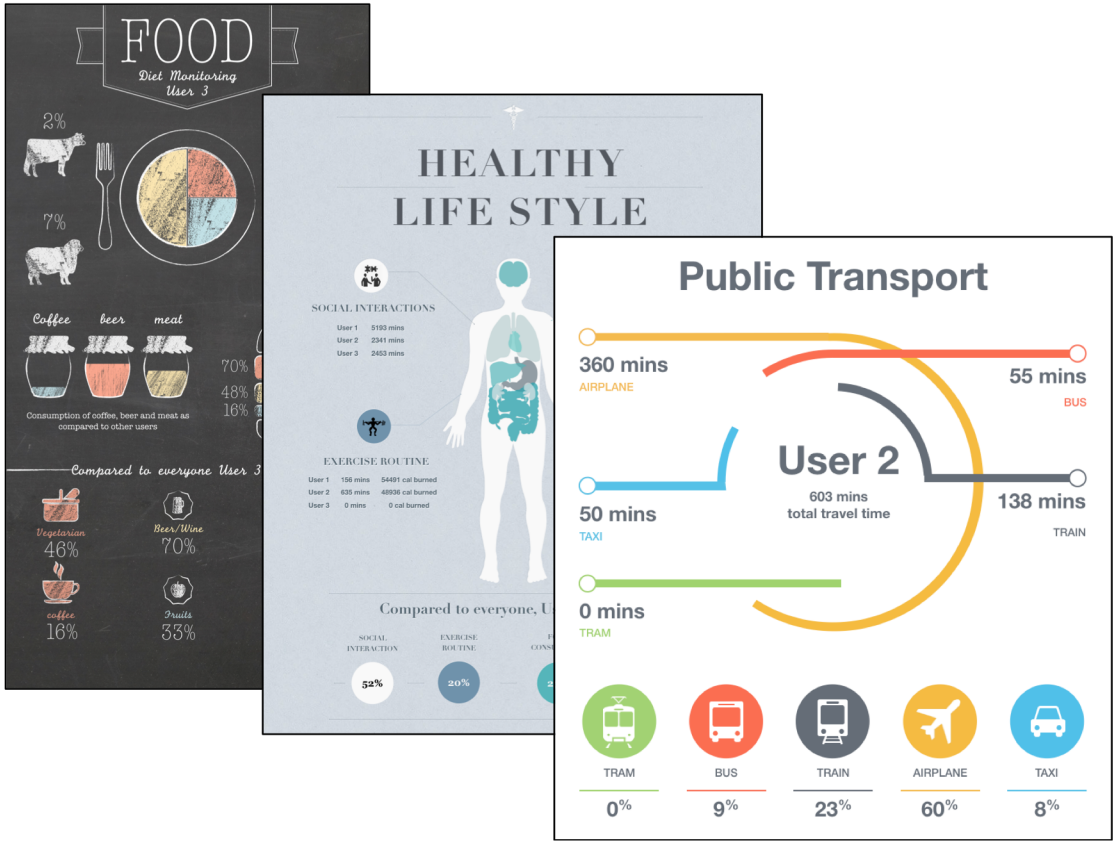
LADT Sub-Task

The LADT subtask aimed to identify **Activities of Daily Living** (ADLs) from lifelogs, which have been employed as indicators of the health of an individual. NTU group (Taiwan) took part in the LADT task and developed a new approach for the multi-label classification of lifelog images.

Traveling
Face-to-face interacting
Using a computer
Cooking
Eating
Time with children
Houseworking
Relaxing
Reading
Socialising
Praying
Shopping
Gaming
Physical activities
Creative activities
Other activities

LIT Sub-Task

- Generate insights from lifelogs
- Inspired by Quantified Self movement



LIT Sub-Task

One group took part in the LIT task. THUIR (China) developed a number of detectors for the lifelog data to automatically identify the status/context of a user:

inside/outside status,
alone/not alone status
working/not working status.

Operate over non-visual and visual data.

A comparison between the two approaches showed that the visual features (integrating supervised machine learning) were significantly better than non-visual ones based on metadata.

NTCIR LIFELOG DATASETS

Criteria	NTCIR-12	NTCIR-13	NTCIR-14
Number of Lifeloggers	3	2	2
Number of Days	90 days	90 days	43 days
Collection Size	18 GB	26 GB	14 GB
Number of Images	88,124 images	114,547 images	81,4747 images
Number of Locations	130 locations	138 locations	61 locations
Physical Activities	Moves	Moves	Moves
Calorie Burn	Watch	Watch	Watch
Step Count	Watch	Watch	Watch
Heart Rate	Watch	Strap	Watch
Blood Glucose	-	Daily	Continuous
Music Listening	-	Last.FM (1 user)	Last.FM
Cholesterol	-	Weekly	-
Uric Acid	-	Weekly	-
Manual Diet Log	-	Y	Y
Conventional Photos	-	-	Smartphone

NTCIR Lifelog Tasks

- Have a look at our draft book chapter
- http://sakailab.com/ntcirbookdraft/

Early Progress in Lifelog Organisation and Retrieval at NTCIR

Cathal Gurrin, Hideo Joho, Frank Hopfgartner, Liting Zhou, Rami Albatal, Graham Healy, Duc-Tien Dang-Nguyen

Abstract The Lifelog task at NTCIR was a comparative benchmarking task with the aims of progressing research into the organisation and retrieval of data from multimodal lifelogs. The Lifelog task ran for three years from NTCIR-12 until NTCIR-14; it supported participants to submit to five subtasks, each tackling a different challenge related to lifelog retrieval. In this chapter, a motivation is given for the lifelog task and a review of progress since NTCIR-12 is presented. Finally, initial learnings and challenges within the domain of lifelog retrieval is presented.

1 Introduction

As the volumes of personal data being gathered by individuals increases, there is an associated need to provide appropriate data organization and retrieval facilities to users. Such personal data archives can include data from mobile devices, wearable devices and computing devices such as tablets or laptops, along with social media content. Associated with the increase in the volume of personal data, there has been a rise in the level of interest in personal data organization and analyt-

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NTCIR LIFELOG LEARNINGS

- The best performing retrieval systems have enhanced the provided metadata by relying on additional visual concept detectors.
- There was a lexical gap between the terms used by the lifeloggers in their topic descriptions, and the indexed textual content and annotations.
- Integration of external WWW content has positive results.
- Interactive systems have been increasing in interest since NTCIR-12 and the Lifelog Search Challenge (LSC at ICMR) has been started to specifically explore this challenge.
- Document segmentation remains an unsolved challenge.
- There is an observed interest in retrieval and insight generation from lifelog data.

NTCIR LIFELOG – WHAT'S NEXT?

- At NTCIR-15, we are proposing a new pilot task to replace the Lifelog task. This pilot task (called MART) is concerned with **micro-activity detection**, which we feel is more aligned with the Information Retrieval focus of NTCIR.
- Micro-activities are **small everyday tasks** such as 'writing an email', making a sandwich, daydreaming, etc.

NTCIR LIFELOG - MART Data

- Timestamped lifelog camera data from a wearable camera (similar to lifelog)
- EEG (Electroencephalography) to capture brain activity levels.
- EOG (Electrooculogram) to capture eye movements.
- GSR (Galvanic Skin Response) to capture skin conductivity, a correlate of stress levels.
- HR (heart rate) of the individual.
- Accelerometer (movement at multiple points) on the body.
- Detailed Computer Interactions (using loggerman software) to capture information.
- Facial expressions via inbuilt webcams.

Participate in …

MART pilot task at NTCIR-15 (?)

Lifelog Search Challenge (LSC 2020) in Dublin Ireland, at ICMR 2020.