



HCMUS at the NTCIR-14 Lifelog-3 Task

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Outline

1. Lifelog-3 task
2. Retrieval System Overview
 - Data processing
 - User interaction
3. Experiment
4. Result
5. Conclusion

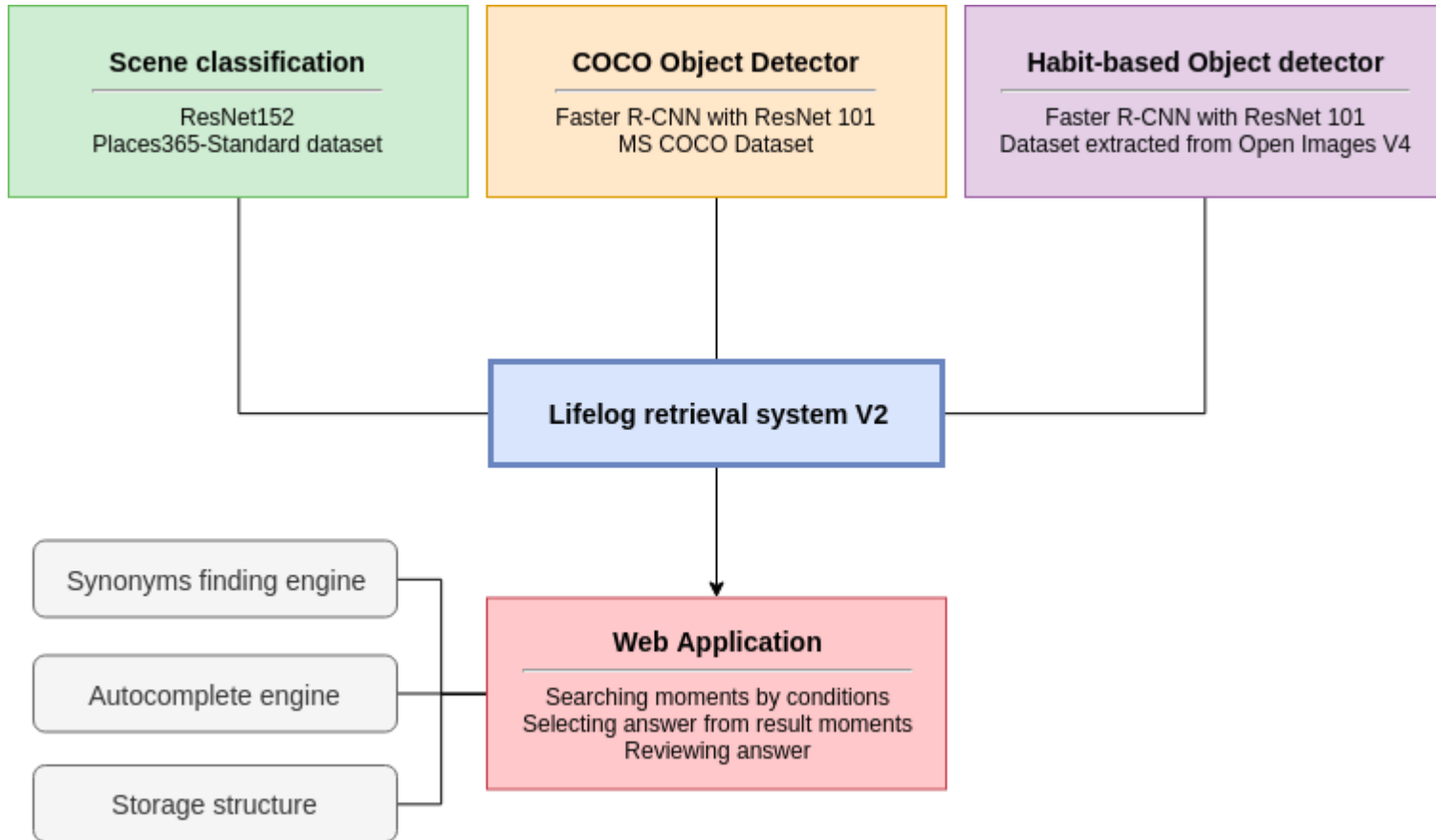
Lifelog-3 task

1. Advance the research in lifelogging
2. Three sub-tasks:
 - Lifelog Insight Task (LIT)
 - Lifelog Activity Detection Task (LADT)
 - **Lifelog Semantic Access Task (LSAT)**
 - **Interactive manner**
 - **Automatic manner**
3. Dataset:
 - 42 days
 - **Multimedia, Biometrics, Human Activity, Computer Usage**

Retrieval System Overview

1. Offline data processing
2. User interaction

Retrieval System Overview



Scene classification

- Model: Residual Network (ResNet)
- Dataset: Places365-Standard dataset
 - 102 scene attributes
 - 365 scene categories
- Filter attributes, categories

Scene classification



car interior (0.785)

airplane cabin (0.062)

bus interior (0.052)

cockpit (0.047)

train interior (0.011)



roof garden (0.256)

greenhouse/indoor (0.112)

topiary garden (0.084)

botanical garden (0.055)

balcony/interior (0.044)



car interior (0.298)

staircase (0.045)

patio (0.042)

cockpit (0.042)

coffee shop (0.034)



attic (0.782)

living room (0.097)

bedroom (0.083)

hotel room (0.003)

alcove (0.08)

Object detection

- COCO Object detection
 - 80 concepts, 11 super-categories
- Habit-based object detection
 - A set of detectors
 - To detect concepts in the lifelogger's daily activities

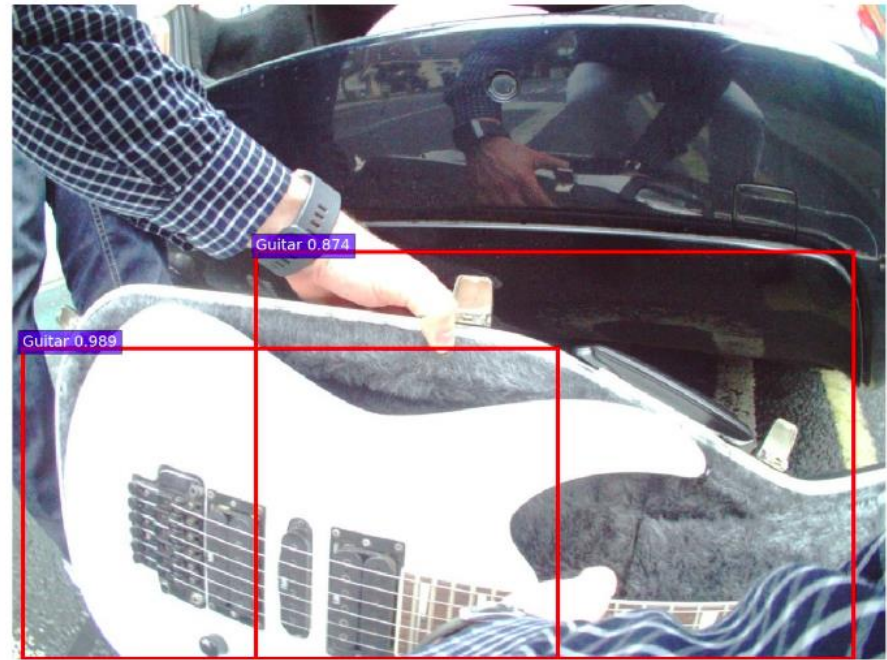
Object detection

- COCO Object detection
 - **Faster R-CNN**
 - **MS COCO Dataset**
- Habit-based object detection
 - **Faster R-CNN**
 - Extracted from **Open Images Dataset V4**

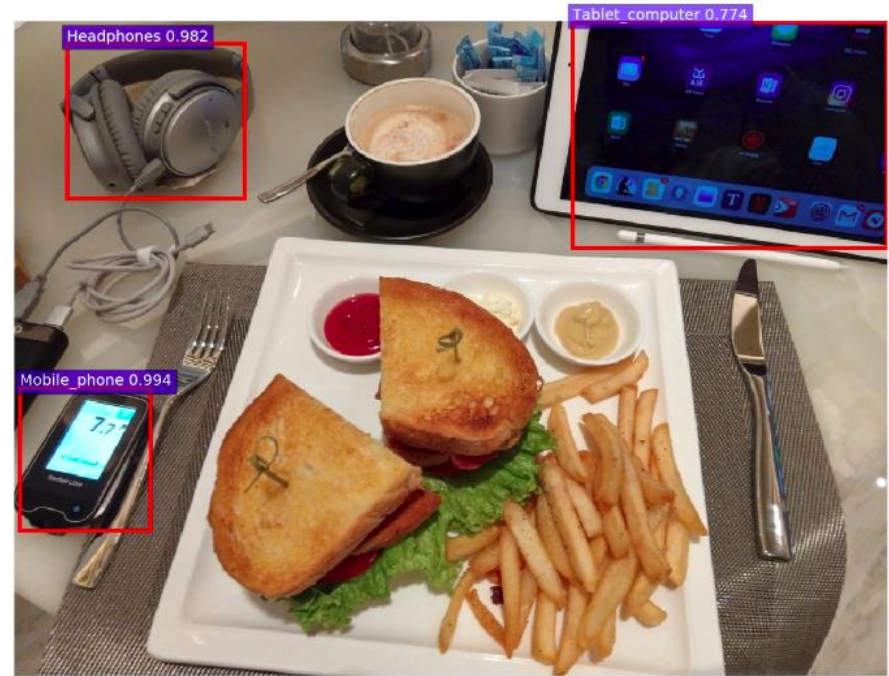
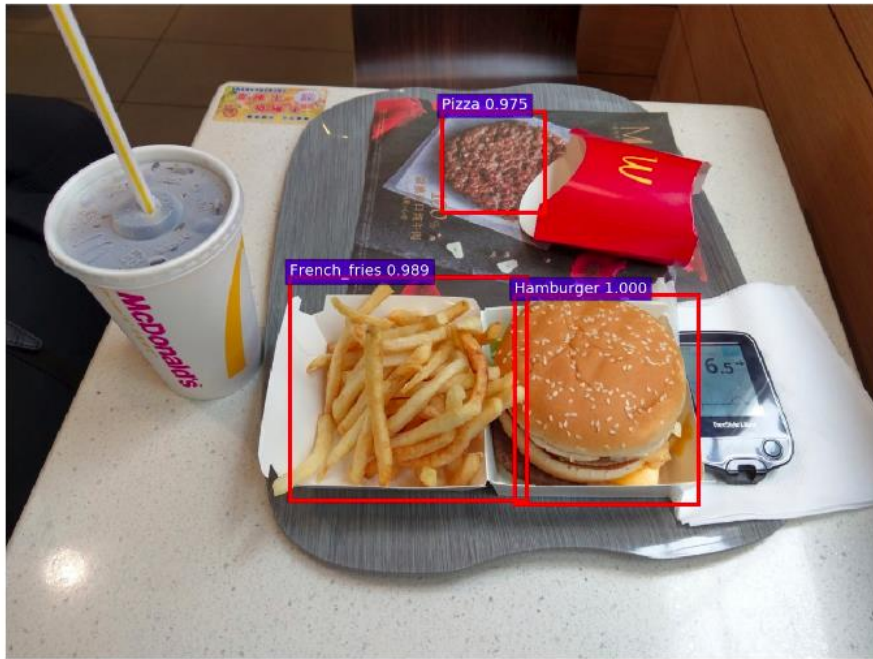
Open Images Dataset V4



Habit-based object detection



Habit-based object detection



User interaction

- A friendly user web interface that allow the user to:
 - Input criteria (scene, concepts, time, .etc)
 - Traverse back and forth from a moment
 - Modify answer

User interaction

LSC SYSTEM Retrieve Answer About

Search >

Search topic

Enter the search topic

Basic criteria Location

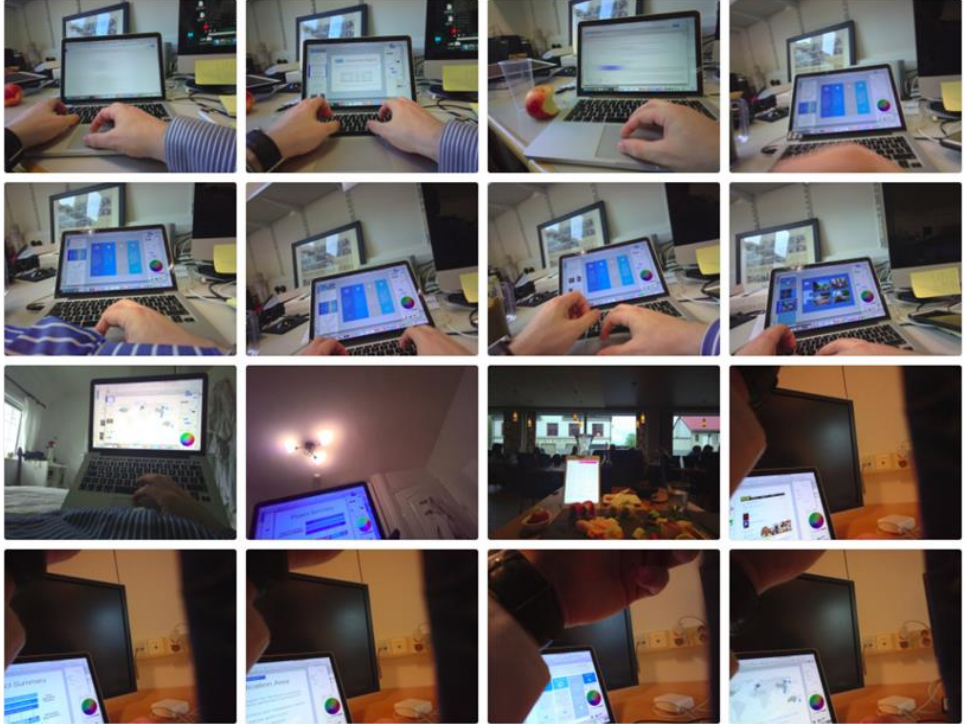
Attributes: Accuracy: High ?

Categories: Accuracy: High ?

Concepts: ?

Search

< Result - 31 result(s) Submit answer



< 1 2 > 16 / page

User interaction

LSC SYSTEM Retrieve Answer About

Search >

Search topic

Basic criteria Location

2016	Aug	Month	Year			
Su	Mo	Tu	We	Th	Fr	Sa
31	01	02	03	04	05	06
07	08	09	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	01	02	03
04	05	06	07	08	09	10

From time

Select time

To time

Select time


Query by date information

Extra information:

Location name:

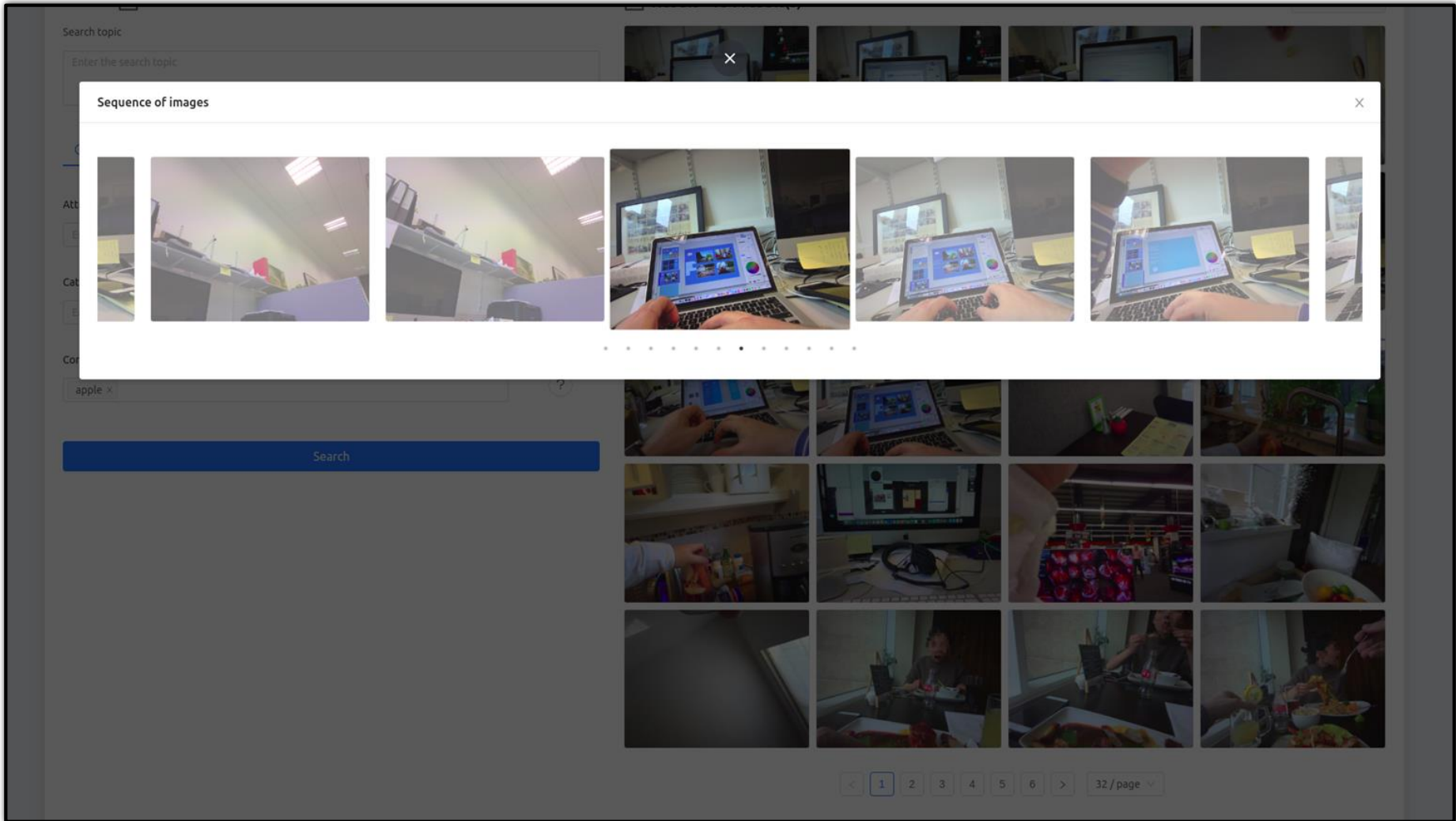
Search

Result - 3 result(s) Submit answer



< 1 > 16 / page

User interaction



User interaction

LSC SYSTEM Retrieve ✓ Answer About

Review answer

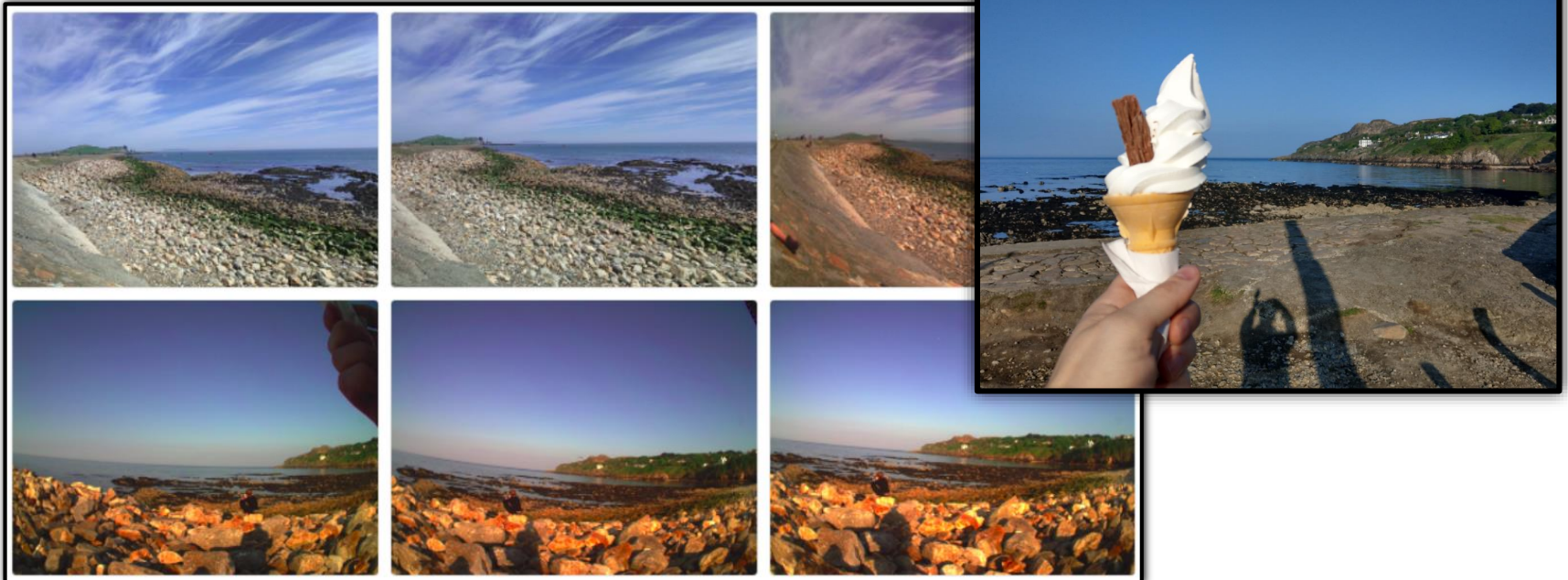
Select answer: 008

u1_20180512_1811_i02

The image displays a user interface for reviewing video answers. At the top, there is a navigation bar with 'LSC SYSTEM', 'Retrieve', 'Answer' (highlighted), and 'About'. Below this, the 'Review answer' section features a dropdown menu set to '008'. The main area contains a 3x6 grid of video thumbnails. Each thumbnail shows a first-person perspective of a person holding a smartphone. The scenes include a train platform, a street with a building, a bus stop, a park-like area, a person in a dark jacket, and a person with a red bag. A tooltip with the ID 'u1_20180512_1811_i02' is positioned above the second thumbnail in the first row. Each thumbnail has a red 'x' icon and a blue 'i' icon at the bottom.

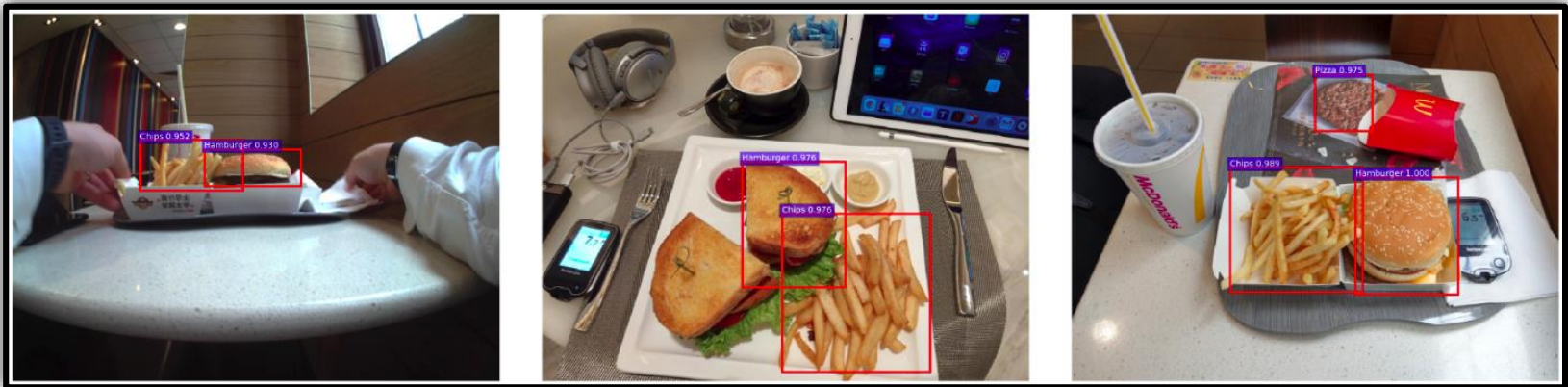
Experiment

- Find the moment when User 1 was eating ice-cream beside the sea



Experiment

- Find the moment when User 1 was eating fast food alone in a restaurant.



Results

- Highest result in NTCIR-14 LSAT
- Rank 1 in ImageCLEF 2019 Lifelog - LMRT
- Top 3 LSC Lifelog Search Challenge (LSC 2019)

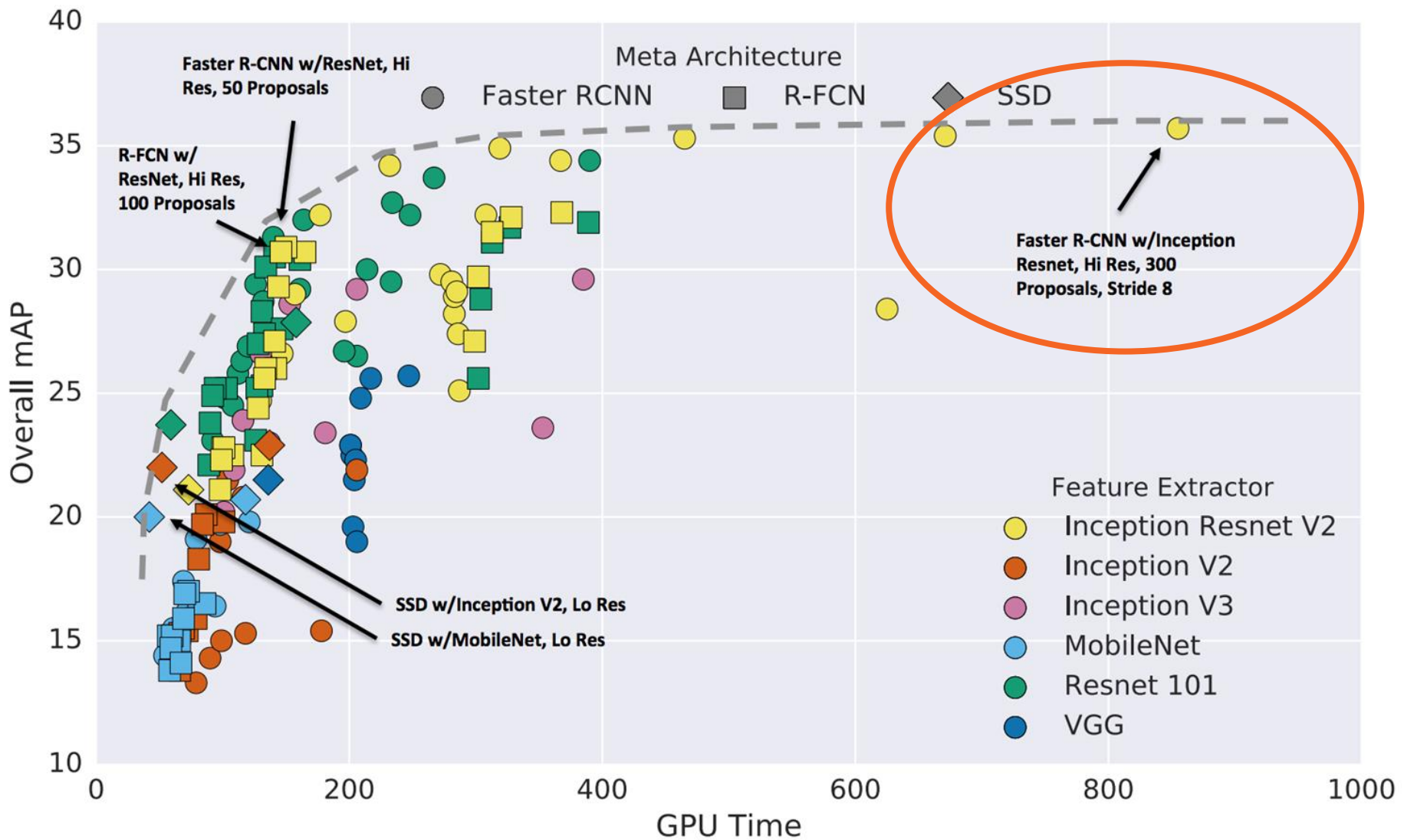
Group ID	Run ID	Approach	MAP	P@10	RelRet
NTU	NTU-Run1	Interactive	0.0632	0.2375	293
NTU	NTU-Run2	Interactive	0.1108	0.3750	464
NTU	NTU-Run3	Interactive	0.1657	0.6833	407
DCU	DCU-Run1	Interactive	0.0724	0.1917	556
DCU	DCU-Run2	Interactive	0.1274	0.2292	1094
HCMUS	HCMUS-Run1	Interactive	0.3993	0.7917	1444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

Conclusion

- Retrieval System
 - Data processing, User interaction
 - Use visual information
- Future work
 - Make use of other metadata
 - Automatic run

THANK YOU

Methods comparison



Lifelog Semantic Access Task (LSAT)

- Retrieve specific moments in the lifelogger's life
- Example: Find the moment when User 1 was eating ice-cream beside the sea.

