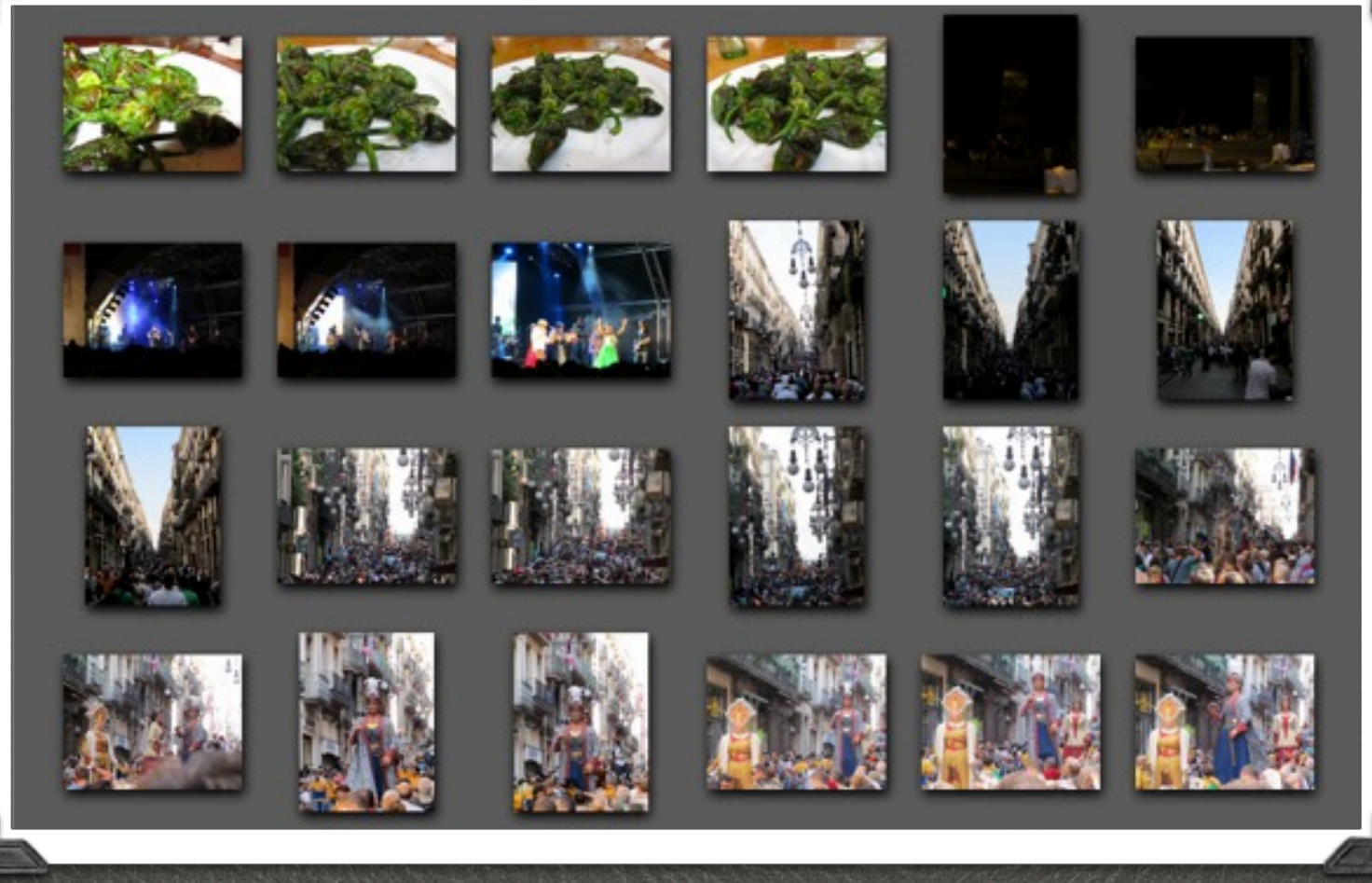


How Do People Organize Their Photos in Each Event and How Does It Affect Storytelling, Searching and Interpretation Tasks?

Jesse Gozali, Min-Yen Kan — **National University of Singapore**
Hari Sundaram — **Arizona State University**

300+ Billion Photos

- We take a lot of photos
  - **Facebook**: 90 Billion (Jan 2011)
  - **Flickr**: 6 Billion (Aug 2011)
  - **Instagram**: 1 Billion (Apr 2012)
- With many devices
  - Camera phones: 2.5 Billion (Nov 2009)

Source: http://blog.1000memories.com/94

The Digital Shoebox

- How do we organize our photos?
  - Folders
  - Events
  - Faces
  - Locations

- What do we do with hundreds of photos in each event?

Organizing Within

- Group an event into smaller groups called *"chapters"*

- Complements existing methods

- Automatic organization (ICMEW 2012 paper: *"Hidden Markov model for event photo stream segmentation"*)

- First study on photo organization within an event

Outline

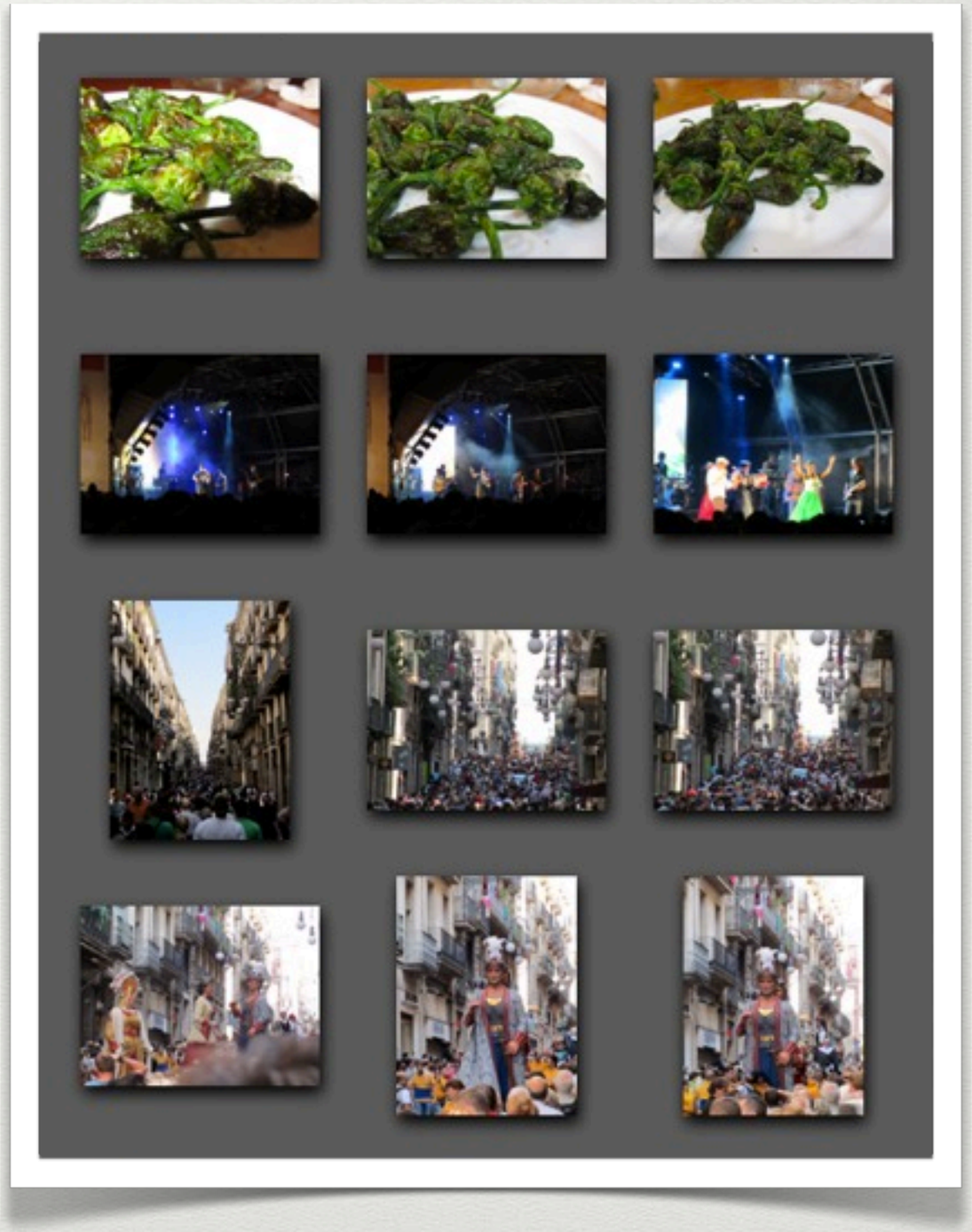
- Related work
- User study
  - Q1: How do people organize their photos in each event?
  - Q2: How does it affect storytelling, searching and interpretation tasks?
  - Q3: What layout aspects are important for chapter-based photo organization?

Related Work: User Studies

- How people manage their photo collections
  (Rodden ’99, Rodden & Wood ’03, Cunningham & Masoodian ’07)
  - Organizing photo collections into folders is very useful (according to events in chronological order)
  - Having many photos visible at once allows users familiar with the photos to scan them very quickly
- Photo sharing technologies (Frohlich *et. al.* ’02)
- Photowork: activities between capture and sharing (Kirk *et. al.* ’06)
- Personal and social photo collections (Sandhaus & Boll ’11)

Related Work: Photo Layouts

- Three important issues:
  - View hierarchy
    (Graham *et. al.* ’02)
  - Visualizing chronological order (Time Quilt: Huynh *et. al.* ’05)
  - Maximizing screen space usage (PhotoMesa: Bederson ’01)



User Study

- Q1: How do people organize their photos in each event?
- Q2: How does it affect storytelling, searching and interpretation tasks?
- Q3: What layout aspects are important for chapter-based photo organization?

User Study

- 23 college students, 8096 photos in 92 events
- Beginning of the session
  - Choose 4 favorite photos
  - *"Group the photos into chapters according to [their] preference and liking"*
  - Demo (to avoid learning effects)
- Tasks (within-subject design; avoid ordering effects)
  - T1: Storytelling from familiar event photos
  - T2: Finding a given photo from familiar event photos
  - T3: Interpreting unfamiliar event photos
- Questionnaires with a 5-point Likert scale, semi-structured interview

Chaptrs

Event Library

Merce 2010 *Sep 24, 2010*

Plain Grid Layout

Set as thumbnail

206 photos

1 2 3 4

Layouts

Chaptrs

Event Library

Merce 2010 *Sep 24, 2010*

Bi-Level Layout

Edit chapter title | Set as thumbnail

At the beach 4:20 AM
Concert 5:26 AM
5:45 PM
Parade 5:51 PM
6:11 PM
Jaume 6:16 PM
6:37 PM

206 photos in 18 chapters

1 2 3 4
Layouts

Chaptrs

Event Library

Merce 2010 *Sep 24, 2010*

At the beach 2

Concert 3

5:45 PM 8

Grid-Stacking Layout

Edit chapter title | Set as thumbnail

206 photos in 18 chapters

1 2 3 4
Layouts

Chaptrs

Event Library

Merce 2010 *Sep 24, 2010*

7:04 PM

7:12 PM

7:14 PM

Space-Filling Layout

Edit chapter title

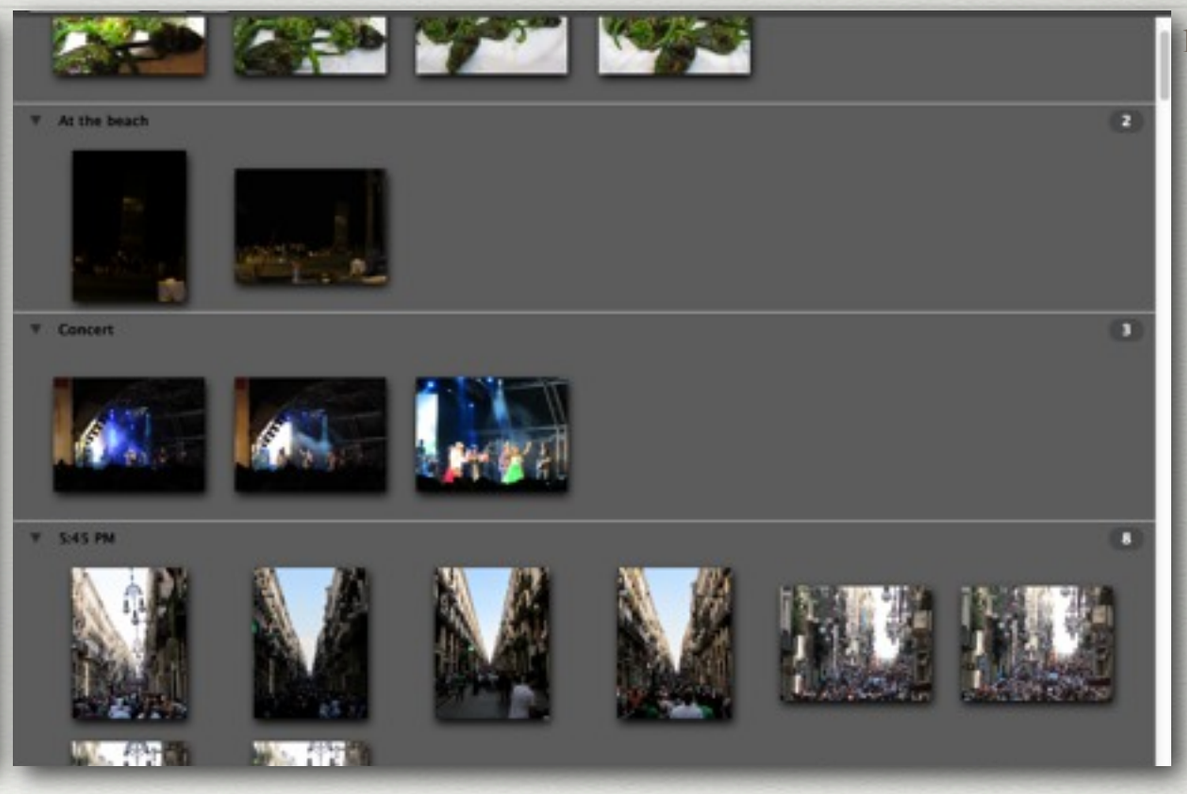
Set as thumbnail

206 photos in 18 chapters

1 2 3 4

Layouts

Plain Grid Layout



Grid Stacking Layout

Bi-Level Layout

Space-Filling Layout

Q1: How do people organize their photos in each event?

- Users value **chapter consistency** more than the chronological order of the photos

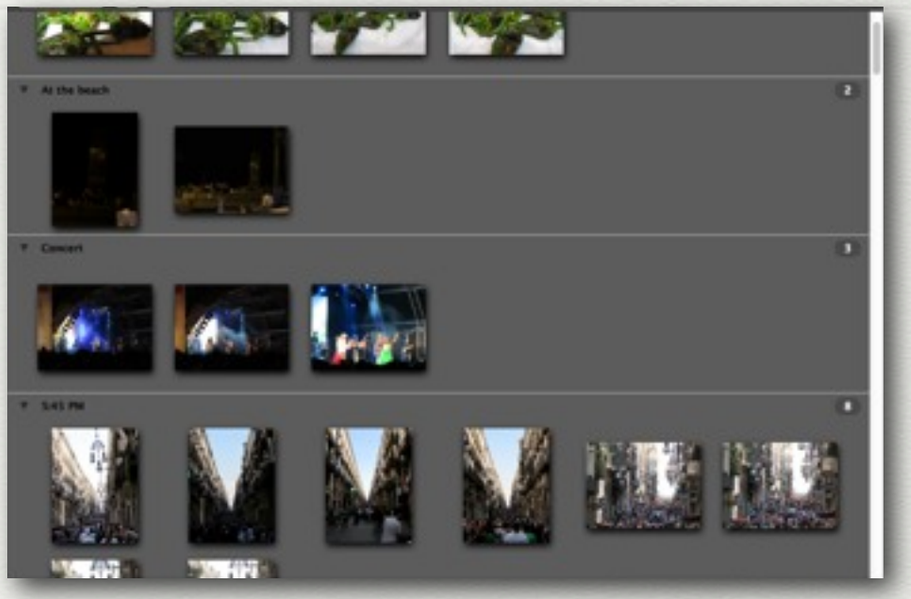
- Criteria for chapters include
  - Moment (*"according to time"*)
  - Object (*e.g.* railroad tracks, characters at cosplay event)
  - Location (*e.g.* tourist spots)
  - Photography type (*e.g.* scenic photos vs portrait photos)
  - Intention (*e.g.* silly shots, archival)

Q1: How do people organize their photos in each event?

- Choice of **criteria** and **granularity** for chapter grouping are very subjective
- For example
  - Speakers at a conference as one ToC chapter
  - Photos of a location at different times in one chapter, but scenic photos separated from portrait photos
  - Fine-grain chapters by visual similarity, unless *"[its] for a big event because there will be too many chapters"*
  - Aversion towards chapters with only one or two photos

Q2: How does it affect storytelling, searching and interpretation tasks?

Plain Grid Layout



Grid Stacking Layout

Bi-Level Layout

Space-Filling Layout

Q2: How does it affect storytelling, searching and interpretation tasks?

Questionnaire Statement	Bi-Level	Grid-Stacking	Space-Filling	Plain Grid
The layout helps present the event's story for sets with many photos	$4.2_{0.005}$	$4.2_{0.005}$	$3.7_{0.005}$	2.4
The layout helps present the event's story for sets with few photos	$4.1_{0.005}$	$4.3_{0.005}$	$4.1_{0.005}$	3.2
The layout helps them remember the event's story for sets with many photos	$4.0_{0.001}$	$4.3_{0.001}$	$3.9_{0.001}$	2.6
The layout helps them remember the event's story for sets with few photos	$4.0_{0.05}$	$4.4_{0.001}$	$4.1_{0.001}$	3.2
The layout helps to find a photo in a set with many photos	$3.6_{0.01}$	$4.4_{0.001}$	$3.7_{0.001}$	2.7
The layout helps to find a photo in a set with few photos	3.6	$4.4_{0.001}$	$4.0_{0.001}$	3.1
The layout helps to interpret photos of an event with many photos	$3.9_{0.005}$	$4.6_{0.005}$	$4.0_{0.005}$	2.9
The layout helps to interpret photos of an event with few photos	$3.7_{0.05}$	$4.4_{0.001}$	$3.9_{0.001}$	3.1

- Two-tailed paired student's t-test
- Chapter grouping helps present the event's story, find photos, and interpret unfamiliar photos.
- The baseline plain grid layout was preferred the least for all three tasks.
  - *"scrolling, scrolling, scrolling ... [did] not know where to stop and say something more"*
  - *"I can't tell if the photos are apart or together"*

Q3: What layout aspects are important for chapter-based photo organization?

- **Chronological order of chapters** more valued than maximizing screen space usage
- **Chapter consistency** more valued than chronological order of the photos
- Overview of event photos afforded by **chapter thumbnails**

Conclusion

- First study to explore chapter-based photo organization
  - More to do: longitudinal study; more subjects
- Primary findings
  - Users value chapter consistency more than chronological order of the photos
  - Choice of chapter criteria and granularity for chapter groupings are very subjective
  - Users value chronological order of the chapters more than maximizing screen space usage in photo layouts

Thank you!