

D. Floros et al



2 Contribution

System components
Database
User access control
Tour generation

Internal learning
Classification - relational quantities
Identification
Optimization

- **5** Related work
- 6 Recap

7 Acknowledgment



2 Contribution

3 System components Database User access control Tour generation

Internal learning
Classification - relational quantities
Identification
Optimization

5 Related work

6 Recap

Acknowledgment





Mobile web application at edu.lark.gr







- Mobile web application at edu.lark.gr
- Personalized tour planner







- Mobile web application at edu.lark.gr
- Personalized tour planner
- On-site personal guide







- Mobile web application at edu.lark.gr
- Personalized tour planner
- On-site personal guide
- Local thematic walks
 - architecture
 - culture customs
 - environment
 - history
 - excursions
 - shopping
 - edification
 - culinary
 - recreation



1 Motivation

2 Contribution

3 System components Database User access control Tour generation

Internal learning
Classification - relational quantities
Identification
Optimization

5 Related work

6 Recap

Acknowledgment

Lark community



- Unified platform
 - modification
 - distribution
 - customization
 - rendering

of location-aware content

- New content
 - open or copyrighted
 - little or no technical background
 - create and connect user communities



Lark community



- Unified platform
 - modification
 - distribution
 - customization
 - rendering

of location-aware content

- New content
 - open or copyrighted
 - little or no technical background
 - create and connect user communities

Original material that is *hard* to uncover otherwise





User feedback is crucial

- Direct feedback contribution
- Users **enhance** the system





User feedback is crucial

- Direct feedback contribution
- Users enhance the system
- Automatic using various metrics
 - was the tour completed?
 - time en-route and at each location
 - search history





User feedback is crucial

- Direct feedback contribution
- Users enhance the system
- Automatic using various metrics
 - was the tour completed?
 - time en-route and at each location
 - search history

Better association of attributes to nodes





2 Contribution

System components
Database
User access control
Tour generation

Internal learning
Classification - relational quantities
Identification
Optimization

- 5 Related work
- 6 Recap
- Acknowledgment



• Lark multimedia database

- text
- photographs
- voice narration
- video
- music

associated with

- geographic location
- indoor position





• Collective knowledge





- Collective knowledge
- Account management of registered and anonymous users



flark

- Collective knowledge
- Account management of registered and anonymous users
- Users
 - add, modify, review locations and descriptions
 - suggest category tags
 - annotate and review



- Collective knowledge
- Account management of registered and anonymous users
- Users
 - add, modify, review locations and descriptions
 - suggest category tags
 - annotate and review
- Records for
 - voting history
 - annotations
 - editing of entries
 - tours taken





Tour generation



Optimal generation of personal guides

- distance or travel time
- time-windows
- duration constraints



Tour generation



Optimal generation of personal guides

- distance or travel time
- time-windows
- duration constraints
- Interactive tours based on
 - current position
 - sequence path
 - user history



Tour generation



Optimal generation of personal guides

- distance or travel time
- time-windows
- duration constraints
- Interactive tours based on
 - current position
 - sequence path
 - user history

Unique experience adapt to user preferences





2 Contribution

3 System components
Database
User access control
Tour generation

 Internal learning Classification - relational quantities Identification Optimization



6 Recap

7 Acknowledgment



- locations are nodes
- paths are edge sequences



- locations are nodes
- paths are edge sequences
- Nodes and edges are associated with
 - classes
 - multimedia content



- locations are nodes
- paths are edge sequences
- Nodes and edges are associated with
 - classes
 - multimedia content
- Content assigned to edges is filtered
 - transportation means
 - hour of the day





- locations are nodes
- paths are edge sequences
- Nodes and edges are associated with
 - classes
 - multimedia content
- Content assigned to edges is filtered
 - transportation means
 - hour of the day
- Related content
 - proximity
 - similarity



lark

- Characterize the nodes
- Generate tours
- Collect feedback from the user
- Feature vectors of attributes
- Elicited or crowd-sourced
- k-means classifier
- Alternative suggestions





Correct labeling of generated tours

- Identify common topics
- Correctly identify cluster
- Use open-source data as input

Discover new and interesting connections





Customized tours

- Location
- Interests





Customized tours

- Location
- Interests

Constraints

- Transportation
- Traffic conditions
- Time spent in each node
- Opening-closing hours
- Timeline







Mobile tour applications

- Acoustiguide (2014)
- Richmond Olympic Experience (ROX)
- Walking Cinema: Murder on Beacon Hill (2013)
- Berlin wall

Context-aware applications

- Cyberguide (1996)
- LifeMap (2011)



1 Motivation

2 Contribution

3 System components Database User access control Tour generation

Internal learning Classification - relational quantities Identification Optimization

5 Related work

6 Recap

7 Acknowledgment



Creation - distribution of multimedia materials

- Text
- Voice narration
- Songs music
- Photographs video



Creation - distribution of multimedia materials

- Text
- Voice narration
- Songs music
- Photographs video

Self-guided tours utilizing mobile technology

- GPS
- Wi-Fi position estimation



Technical contributions

• Facilitate the generation, storing, distribution and rendering of multimedia, multi-source content



Technical contributions

- Facilitate the generation, storing, distribution and rendering of multimedia, multi-source content
- Classify and characterize landmarks and sites, exploiting information collected via crowd-sourcing



Technical contributions

- Facilitate the generation, storing, distribution and rendering of multimedia, multi-source content
- Classify and characterize landmarks and sites, exploiting information collected via crowd-sourcing
- Generate mobile tour guides customized to the user's schedule, pace, taste and interests



Technical contributions

- Facilitate the generation, storing, distribution and rendering of multimedia, multi-source content
- Classify and characterize landmarks and sites, exploiting information collected via crowd-sourcing
- Generate mobile tour guides customized to the user's schedule, pace, taste and interests
- Collect direct and indirect user feedback



Technical contributions

- Facilitate the generation, storing, distribution and rendering of multimedia, multi-source content
- Classify and characterize landmarks and sites, exploiting information collected via crowd-sourcing
- · Generate mobile tour guides customized to the user's schedule, pace, taste and interests
- Collect direct and indirect user feedback

General contributions

• Positive feedback on local communities



Technical contributions

- Facilitate the generation, storing, distribution and rendering of multimedia, multi-source content
- Classify and characterize landmarks and sites, exploiting information collected via crowd-sourcing
- Generate mobile tour guides customized to the user's schedule, pace, taste and interests
- Collect direct and indirect user feedback

General contributions

- Positive feedback on local communities
- Sustain and advance
 - local culture
 - arts
 - businesses and products



• iPhone - iPad - Android





•••••• vf GR 3G 3:33 PM ∦ 79% ■ C Back Thessaloniki, Greece

Aristotle University of Th...

1925 establishments in Greece-Aristotle University of Thessaloniki-Articles containing Greeklanguage text-Article...



White Tower of Thessaloniki

All articles lacking intext citations-All articles with dead external links-Articles containing Greek-language text-Articles containi...







- iPhone iPad Android
- Content caching







Aristotle University of Th...

1925 establishments in Greece-Aristotle University of Thessaloniki-Articles containing Greeklanguage text-Article...



White Tower of Thessaloniki

All articles lacking intext citations-All articles with dead external links-Articles containing Greek-language text-Articles containi...



		and the second
fark	0	101
Lark	Map	Settings

lark

- iPhone iPad Android
- Content caching
- Volunteer as a **BETA** tester
 - http://goo.gl/forms/ 9TMuWkQfFZdCNGuB3









Aristotle University of Th...

1925 establishments in Greece-Aristotle University of Thessaloniki-Articles containing Greeklanguage text-Article...



White Tower of Thessaloniki

All articles lacking intext citations-All articles with dead external links-Articles containing Greek-language text-Articles containi...



		And in case of the local data and t
Yark	D	-
Lark	Map	Settings





Prof. Xiaobai Sun of Duke University for her critical comments



Dimitra Petraki for her valuable help during development

Thank you!

Contact: fcdimitr@auth.gr



- G. D. Abowd, C. G. Atkeson, J. Hong, S. Long, R. Kooper, and M. Pinkerton. Cyberguide: A Mobile Context-Aware Tour Guide. Baltzer Journals, 3(September 1996):1–21, 1996. ISSN 10220038. doi: 10.1023/A:1019194325861. URL http://www.springerlink.com/index/T028132685176713.pdf.
- G. Anthes. Topic models vs. unstructured data. Communications of the ACM, 53(12):16-18, 2010.
- S. Burigat and L. Chittaro. Location-aware visualization of VRML models in GPS-based mobile guides. In Proceedings of the tenth international conference on 3D Web technology, pages 57–64. ACM, 2005.
- J. Chon and H. Cha. LifeMap: A smartphone-based context provider for location-based services. IEEE Pervasive Computing, 10(2):58–67, 2011. ISSN 15361268. doi: 10.1109/MPRV.2011.13.
- A. K. Dey. Context-aware computing. Ubiquitous Computing Fundamentals, pages 321-352, 2010.
- A. Fevgas, P. Tsompanopoulou, and P. Bozanis. iMuse Mobile Tour: A personalized multimedia museum guide opens to groups. Proceedings IEEE Symposium on Computers and Communications, pages 971–975, 2011. ISSN 15301346. doi: 10.1109/ISCC.2011.5983968.
- S. R. Gulliver, G. Ghinea, M. Patel, and T. Serif. A context-aware Tour Guide: User implications. Mobile Information Systems, 3(2):71-88, 2007.
- A. Pashtan, R. Blattler, A. Heusser, and P. Scheuermann. CATIS : A Context-Aware Tourist Information System. (June), 2003.
- D. Saranyaraj. The virtual guide for assisted tours using context aware system. International Conference on Signal Processing, Image Processing and Pattern Recognition 2013, ICSIPR 2013, 1:1–3, 2013. doi: 10.1109/ICSIPR.2013.6497973.
- B. Schilit, N. Adams, and R. Want. Context-aware computing applications. In *Mobile Computing Systems and Applications, 1994. WMCSA 1994.*, pages 85–90. IEEE, 1994.