

Μέθοδοι Ανάπτυξης Ευφών Συστημάτων βασισμένων σε Εικόνα

Μέθοδοι Έρευνας #1

Η εργασία στοχεύει στην ανάπτυξη ενός συστήματος ανάκτησης εικόνων με βάση τα οπτικά τους χαρακτηριστικά και τη γεωμετρία. Ο χρήστης του συστήματος θα μπορεί να θέτει ερωτήματα με τη μορφή εικόνων. Τα αποτελέσματα της αναζήτησης θα κατατάσσονται με βάση κάποιο κριτήριο ομοιότητας.

A1)

- Bay H, Tuytelaars T, Van Gool L (2006) SURF: speeded up robust features. In: European conference on computer vision
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- M.A. Fischler and R.C. Bolles. Random sample consensus—a paradigm for model fitting with applications to image analysis and automated cartography Commun. ACM 24 381–95, 1981.
- Roux, M. McKeown, D.M., Jr. : Feature matching for building extraction from multiple views

A2)

- ETH
- IEEE
- Research Microsoft
- Elsevier
- ΕΜΠ
- ΕΚΕΦΕ Δημόκριτος

- A3) Οι ακόλουθες αναφορές επιλέχθηκαν με σκοπό να προσδιορίσουν το θεωρητικό υπόβαθρο του συστήματος ανάκτησης εικόνων, που περιλαμβάνει στοιχεία όπως οι features detectors, feature descriptors και matching αλγόριθμοι.
- Viral: Visual image retrieval and localization: Y Kalantidis, G Toliás, Y Avrithis, M Phinikettos - Multimedia Tools and Applications, 2011
 - Socio-mobile landmark recognition using local features with adaptive region selection, Neurocomputing: Chunjie Zhang, Yifan Zhang, Xiaobin Zhu, Zhe Xue, Lei Qin, Qingming Huang, Qi Tian,, Volume 172, 8 January 2016
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- Gruen, Armin. "Adaptive least squares correlation: a powerful image matching technique." *South African Journal of Photogrammetry, Remote Sensing and Cartography* 14.3 (1985): 175-187.

A4)

- David G Lowe, Senior Research Scientist at Google
- Herbert Bay, co-founder and CEO of kooaba, ETH Zurich
- Richard Szeliski, *Microsoft Research, Facebook Computational Photography*
- Aggelos Katsaggelos, *Northwestern University, IL*
- Alexandre Alahi, *Postdoc Stanford University*

A5) Image retrieval, Image clustering, Feature extraction, Feature Description, Image Matching, Sub-linear indexing, Location recognition, Landmark recognition, Image localization

A6)

1) Viral: Visual image retrieval and localization: Y Kalantidis, G Tolias, Y Avrithis, M Phinikettos - Multimedia Tools and Applications, 2011

This paper presents an image retrieval and localization web application tool, as the title presents. The structure is the defacto standard with an author section, following the abstract and introduction sections and finally the sections presenting and discussing their work, with overall experiments and results.

The introductory section is giving the approach of the research to the reviewer, giving information about the emerging application on the related ground and it provides a short discussion of their work and study.

Next, the related work is presented, accordingly to the state-of-the-art technologies and algorithms are used. The following sections present the scientific background of algorithms and computer vision techniques used in their custom implementation with depictions of images and samples evaluated by the system.

Following a short walkthrough of the web application accompanied also with output samples.

Last but no least, the experiment section is given with an extensive dataset of images, samples and tables, given with the results of their visual evaluation protocol, and the location-landmark recognition.

Finally, a short discussion summarizes the entire article while their future work is provided as well.

2) Socio-mobile landmark recognition using local features with adaptive region selection, Neurocomputing: Chunjie Zhang, Yifan Zhang, Xiaobin Zhu, Zhe Xue, Lei Qin, Qingming Huang, Qi Tian,, Volume 172, 8 January 2016

The second paper has the a similar structure as the previous one but lacks of deep scientific and theoretical approach. It presents an optimized version of the already state-of-the-art feature extraction algorithms with a slightly better performance.

The article starts with an introductory discussion about the mobile visual applications of visual and landmark recognitions. Authors state the related work that has been made on the ground along with some example images and flowcharts.

Moreover an extensive analysis is being made on the already state-of-the-art techniques while proposing their method over a mathematical documentation. Their system consists of three segments presented with some flowcharts.

Next, the experiment section follows with two sub-sections of different image datasets which are provided with some samples while the results are evaluated by an extensive analysis with graphs and tables.

Lastly, a conclusion summarizes the articles providing some aspects of their future work.