

Session 2: Symbol Recognition and Spotting

Chairs: Muzzamil Luqman (L3i La Rochelle, France)
Syed Saqib Bukhari (DFKI, Germany)

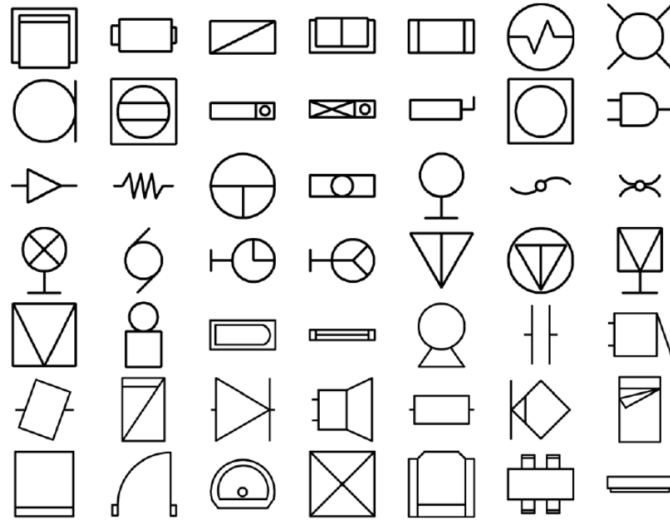
Introduction to the topic

Context, Needs, Main tasks

- Symbol recognition ... OCR?
- Symbols are the building blocks of drawings
- Symbol recognition has traditionally been a first step for the higher semantic level tasks such as recognition, interpretation, understanding, retrieval etc.

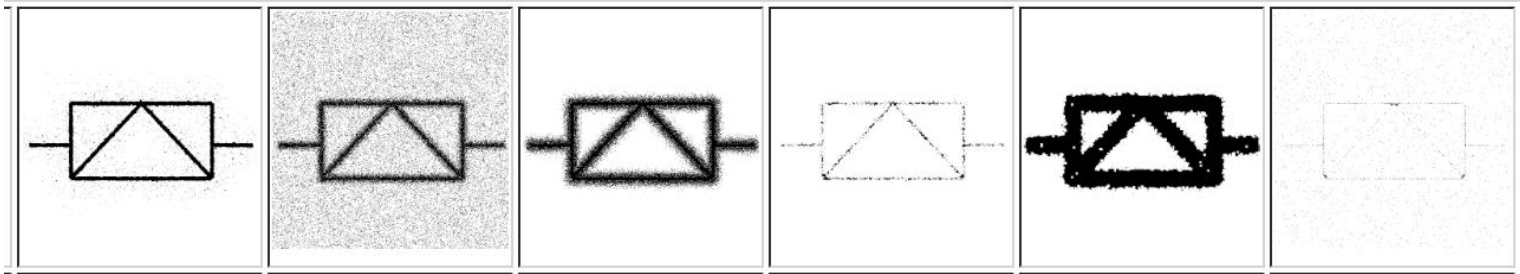
Introduction to the topic

- Symbol Recognition



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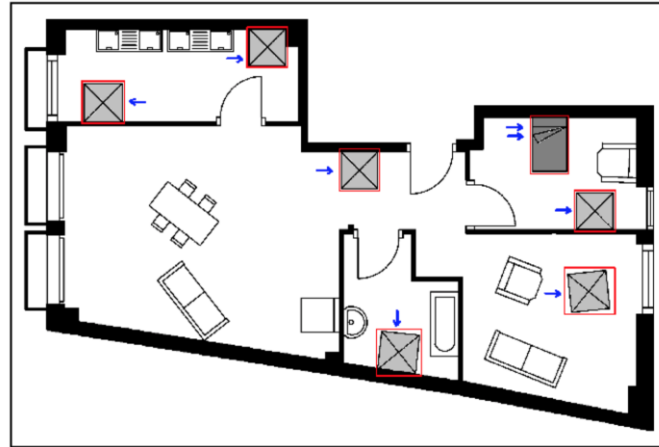
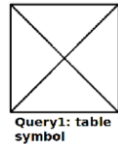
Introduction to the topic

Context, Needs, Main tasks

- Segmentation/recognition paradox
- Symbol spotting is to describe symbols by a very coarse descriptor to foster the querying speed rather than the recognition rates

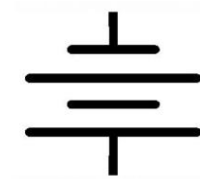
Introduction to the topic

- Symbol Spotting

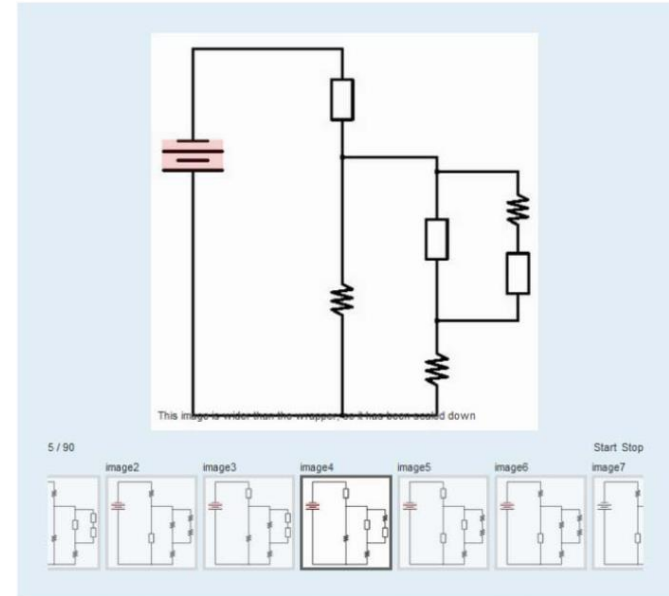


Introduction to the topic

- Symbol Spotting



(a) Query image.



(b) Documents retrieved.

Introduction to the topic

Context, Needs, Main tasks

- Structural, Syntactic and Statistical pattern recognition
- Traditionally graph-based approaches have been used a lot for symbol recognition and symbol spotting
- The methods developed for symbol recognition have benefitted other problems in graphics recognition, document image analysis and pattern recognition in general

Introduction to the topic

Current status, Issues to take into account, Open problems (not yet solved)

- Traditionally learning-free techniques
- Current deep learning trend
- Learning-based methods
- Labelled data ... synthetic or real?

Session outline (each paper: 10 min presentation)

- Paper 1: Learning structural loss parameters on graph embedding applied on symbolic graphs by Hana Jarraya, Oriol Ramos-Terrades, Josep Lladós
- Paper 2: Automated Analysis of Phase Diagram by Bhargava Urala Kota, Nair Rathin Radhakrishnan, Srirangaraj Setlur, Scott Broderick, Krishna Rajan, Venugopal Govindaraju
- Paper 3: Shallow Neural Network Model for Hand-drawn Symbol Recognition in Multi-Writer Scenario by Sounak Dey, Anjan Dutta, Josep Lladós, Alicia Fornés, Umapada Pal
- Paper 4: Graph-based deep learning for graphics classification by Pau Riba, Anjan Dutta, Josep Lladós, Alicia Fornés
- Paper 5: Bringing back Hieroglyph by Sounak Dey, Anjan Dutta, Josep Lladós, Umapada Pal

Paper 1:

Learning structural loss parameters on graph embedding applied on symbolic graphs by Hana Jarraya, Oriol Ramos-Terrades, Josep Lladós

Short description (highlights)

A Graph Embedding (GEM) method. Models an Attributed Graph (AG) as a PGM, using GED as risk function in 1-slack formulation.

SVM for classification. GREC graph dataset from IAM graph database.

Paper 2:

Automated Analysis of Phase Diagram by Bhargava Urala Kota, Nair Rathin Radhakrishnan, Srirangaraj Setlur, Scott Broderick, Krishna Rajan, Venugopal Govindaraju

Short description (highlights)

An automated document recognition tool. Process large quantities of phase diagrams in order to support user queries.

Facilitate the simultaneous screening of a large number of materials without loss of information. Pilot study on phase diagrams of binary metallic alloy systems.

Paper 3:

Shallow Neural Network Model for Hand-drawn Symbol Recognition in Multi-Writer Scenario by Sounak Dey, Anjan Dutta, Josep Lladós, Alicia Fornés, Umapada Pal

Short description (highlights)

Hand drawn symbol recognition with a shallow neural network.

Achieve state-of-the-art results with very less training data.

Experiments on Handwritten symbols from Niclcon datasets.

Paper 4:

Graph-based deep learning for graphics classification by Pau Riba, Anjan Dutta, Josep Lladós, Alicia Fornés

Short description (highlights)

Traditionally graph-based methods are based on learning-free techniques.

Some deep learning techniques from literature for graph-based representations and how they can be used in graphics recognition problems.

Experiments on GREC and Letters graph datasets from IAM graph database.

Paper 5:

Bringing back Hieroglyph by Sounak Dey, Anjan Dutta, Josep Lladós, Umapada Pal

Short description (highlights)

Hieroglyph used by Egyptians long ago.

In the era of tablets, wearable devices and smart phones the sketches are more and more used to retrieve images or words from the personal collection of images.

Neural network architecture to mine as much information as possible from the graphics to map it to the relevant images.

Discussion

Open questions:

- ...
- ...
- ...

(Foster and engage interaction during the panel discussion. The panel discussion engages a conversation between the audience and the presenters of the papers = "the panel")