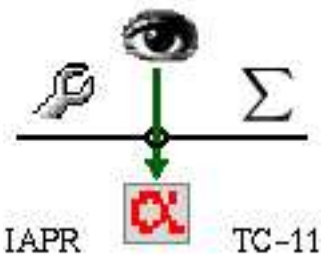
# TC-11 Biannual report
# June 2003

prof. dr. Lambert Schomaker
chair of TC-11
dr. Jianying Hu
vice chair of TC-11




June 24, 2003

# 1 TC-11: the research field

The scientific and technological space is spanned by the following main axes:

- Pixels/vectors vs text processing,
- On-line vs off-line approaches,
- Theory vs applications.

Most new research and application trends which were noted in the 2002 report are continued. As an exception, multimedia information retrieval contributions seem to migrate back to the multimedia-oriented research platforms. However, the TC-11 areas of text recognition in streaming video and in web-based images are thriving. The trend of increasing accents on pen-based computing and handwriting recognition in hand-held devices continues. Also, new applications emerge in camera-based reading systems, such as in support systems for the blind, robotic navigation, advanced license-plate reading and camera-based reading in the environment. Writer identification is a topic which enjoys an increased interest. At the ICDAR'03 benchmark tests will be organized, which is another sign for the increased maturity of this field.

# 2 Processes

2.1 At the ICDAR'2001 TC-11 meeting in Seattle, the current chairman was chosen to continue to hold his position for another period. However, in order to ensure a gradual transfer of TC-11 knowledge and of tasks, it seemed useful to define the position of a vice chair. Ms. Jianying Hu has accepted the position of TC-11 vice chair.

2.2 Also, at the ICDAR'2001, it was decided to appoint an ICDAR Advisory Board, consisting of the TC-10 and TC-11 chairs, together with a former ICDAR organizer. The ICDAR Advisory Board monitors the organization process of the coming ICDAR conference from a relative distance, in order to guarantee continuity over the ICDAR series. The ICDAR Advisory Board currently consists of:

- Josep Llados (TC-10 chair),
- Andreas Dengel (former ICDAR organizer),
- Lambert Schomaker (TC-11 chair).

2.3 The ICDAR Advisory Board is very content with current affairs in the ICDAR'03 organization process. For the ICDAR organisers, the presence of IAPR officials looking over their shoulder may be a new experience.

2.4 The ICDAR Award nomination process has started, coordinated by Josep Llados and the TC-11 chair.

2.5 The web site for TC-11 is regularly updated, including a list of current and relevant conferences: http://www.ai.rug.nl/iapr/tc-11/

2.6 The TC-11 distribution is handled by 'Majordomo' email-list software at tc-11@ai.rug.nl. There are about 216 members. The number of active researchers is higher than this, judging from conference attendance. Membership folders for TC-11 have been distributed at ICPR, ICDAR and IWFHR conferences.

## 3 Events

This is a non-exhaustive list of events:

- The main conference, the International Conference on Document Analysis and Recognition will have its seventh incarnation (7th ICDAR, Edinburgh, Scotland, 3-6 August, 2002)
- WDA2003/Second International Workshop on Web Document Analysis, Edinburgh
- DIAR-03/Workshop on Document Image Analysis and Retrieval, Madison, Wisconsin, June 21, 2003 (with IEEE CVPR'03)
- ICDAR'05, Seoul, Korea.
- 9th IWFHR/9th International Workshop on Frontiers in Handwriting Recognition, 2004, Oct. 26-28, Kokubunji/Tokyo, Japan
- 10th IWFHR/10th International Workshop on Frontiers in Handwriting Recognition, 2006, Oct. 3-5, Le Croisic, France
- Other events are upcoming

## 4 International Unipen Foundation (iUF), concise report - 2002/2003

As usual, added to this document is a brief report concerning the International Unipen Foundation (iUF), an activity in the area of on-line handwriting recognition databases and benchmarks which was initiated from within IAPR/TC-11.

- chair: L. Schomaker
- co-chair: I. Guyon
- treasurer: L. Vuurpijl,
- advisory board: prof. R. Plamondon and prof. G. Lorette

There is still a regular community interest in the Unipen database of on-line handwriting and the software developed by the iUF for accessing Unipen data. There is a W3C standardization effort, InkXML, which in its beginning received input from the iUF. However, the development of this on-line data format for pen computing was considered to be located in the ballpark of multimodal interaction by the W3C consortium. As a consequence, the InkXML development is coupled to VoiceXML and other standards, and progress has slowed down. The iUF regularly receives questions concerning a migration of the current Unipen standard to XML.

Current iUF activities concern standardization in forensic handwriting data analyses and formats. A research grant (1 person year) in this research field was obtained in autumn 2002. Off-line data sets will be annotated and be made available in the future.

# 5 TC-11 SWOT: Strengths, Weaknesses, Opportunities, Threats

## 5.1 Strengths

The TC-11 community is thriving. The multifaceted research field confronts us with more than enough interesting topics in technology research. Strong conferences and stable workshops exist (ICDAR, DAS, IWFHR, WDA and others) which attract many researchers in the field.

## 5.2 Weaknesses

There is a continuous need for input from theoretical pattern recognition, cognitive science, AI, image processing, and even computer vision (due to the increased importance of camera input). The field is strong in its no-nonsense application attitude and the research environment is in many ways tougher than, e.g., theoretical image processing (Lena left: ugly, Lena right: beautiful). However, fundamental input is needed, such that more journal papers will be produced by the community in these harsh times.

## 5.3 Opportunities

The clear vision of concrete pattern-recognition tasks for reading systems will remain appealing to new generations. Benchmarking and standardized evaluation procedures will improve the interpretability of research results. The amount of text which is present in the man-made environment, on web-based images, in video streams and in historical documents will continue to elicit ideas for applications.

## 5.4 Threats

A generation shift is ongoing, and it is difficult to attract interest in IAPR-related activities in the younger researchers. At the same time, IAPR administration is professionalizing and will thus require more effort. Although challenging, the new application areas may not acquire the weight of traditional industrial OCR. It should be noted in this respect that the remaining tasks are tough: camera-based, web-based text reading and historical document processing are quite challenging problems.

## 6 Plans for TC-11 / Jianying Hu

While the traditional focus of the field of document image analysis (DIA) started out with the analysis and conversion of paper documents, it is clear that the meaning of "document" has been expanding dramatically over the last ten years. Being able to adapt to new ways documents are being created and consumed in an ever more technical savvy society is crucial to maintaining the relevance and vigor of this field. I believe TC11 could and should play a major role in promoting research in and attracting young researchers to the new research areas vital to the growth of this community. To name a few:

6.1 Web Document Analysis (WDA). With the ever-increasing use of the Web, a growing number of documents are published and accessed on-line. Although the development of XML and the new efforts on semantic web aim to improve the machine-readability of web documents, it is not going to eliminate the need for content analysis, especially for the kind of web documents created as web publications (vs. services) where visual appearance is critical. Such content analysis is crucial for many application including information extraction, mining, summarization and content re-purposing for mobile access, and this is where DIA can play a unique role. There has been growing attention to WDA within the DIA community, especially following the first WDA workshop held in conjunction with ICDAR'01. Many interesting areas have emerged besides content analysis mentioned above, including utilizing and mining multilingual documents, web page classification, and human interactive proofs (HIP). TC11 could help nurturing this new field through active support and promotion of the WDA workshop series, reaching out to and engaging researchers in IR and WWW communities (e.g., in the form of tutorials, invited speeches, etc.), and improving our own visibility in those communities.

6.2 Electronic ink/Mobile user interfaces/annotation. The success of the latest IWFHR indicates that interest in handwriting recognition is still quite high. One important new drive for electronic ink processing is the increasing capacity and popularity of hand held computers of all forms. Issues in pen based interface design is attracting renewed attention, especially in the context of multi-modal user interfaces for mobile devices, and collaboration and document annotation using such devices. InkXML is in the works and TC11 can play an active role to publicize this effort and the related new research activities.

6.3 Vintage documents/Digital Library. Another area that has attracted increasing attention from this field lately is the analysis of vintage documents, related to the Digital Library effort. This offers unique opportunities as well as challenges for DIA, but has not been well explored so far by this community. Again, TC11 could help by bringing more awareness to this area through the official website.
J.H. / September 2002.

## 7 Conclusion

In our view, TC-11 will remain to represent an important research area in the coming years. We will continue to support the community, modernize the web site and collect and disseminate community information. The current chair is quite willing to hand over his responsibilities to a successor during his last term.
Lambert Schomaker
Jianying Hu