

13th IAPR International Conference on Document Analysis & Recognition

August 23-26, 2015, Prouvé Congress Center, Nancy, France

[relocated from Tunisia]

www.icdar.org

Conference Booklet



Welcome Message from Honorary Chair

Welcome the 13th International Conference on Document Analysis and Recognition (ICDAR'2015) that is organized under sponsorship of IAPR.

Firstly of all I would like to thank the IAPR scientific community for my honorary chair nomination and give my regards first of all to the Volker Märgner, Adel M. Alimi, Jean Marc Ogier, general Chairs and to all people that organized this event.

It is a pleasure for me to remember the history of our scientific community in fact in the 1968 under suggestions of the Italian Nobel Prize Enrico Fermi it was organized in Italy a NATO ASI with the goal of developing the computer science in order to help Italian people to recover them self from the second world war disaster. In fact he said that it would be possible only through a cultural, social, economical and political Italian growth. The 1968 a NATO ASI titled: "Automatic Interpretation and Classification of Images" was organized by Antonio Grasselli a Pisa university Professor. The most important scientists working in Pattern Recognition at such a time were invited to the summer school. Among the others there were Azriel Rosenfeld, Jean Claude Simon, Edoardo Caianiello, Satoshi Watanabe, Harry Adrews, Herbert Freeman, Tony Kasvand, and many others.

The next year, the 1969, it was founded the International Association for Pattern Recognition (IAPR) and King Sun Fu was elected president of our association. Immediately after, in the 1969 the Italian Government started the first school of computer science in Pisa and immediately after, in the 1970, also in Bari in my University was started, furthermore it was activated also in several others of Italian Universities and in 1987 also the computer engineering schools were started in Italy. In 1993, the NATO gave me the possibility to celebrate the 25th anniversary of that lucky event by granting and sponsoring my application. This last Italian ASI gave me the possibility to invite the most part of these IAPR founders.

I hope that this my presence here is of good auspicious for a great development of computer science both in France and in Tunisia and more specifically in Patter Recognition, just as it has been done in this last half of the past century and up to now, in Italy.

Also the Bari University Chancellor Antonio Felice Uricchio and Eugenio Disciascio chancellor of the Bari Polytechnic wishes an excellent ICDAR'2015 celebration.

Staring from the 1991, when it was organized the first ICDAR by Guy Lorette in Saint Malo France, and passing from all the later conferences celebrated every two years and arriving to the last held in 2013 by David Doerman in Washington we had in these last 25 years the possibility to enrich scientific skills attracting several hundreds of researchers from every place in the world and gave to many of us the possibility to develop their new but also the possibility to visit the best city in the world, just as Nancy.

I wish to all you, that following the continuous growing of our community also this conference enrich all of us with the new ideas suggested by those here in presentation.

Congratulations to my friends Venu Govindaraju, Philippe Cudre-Mauroux, David Doerman, and Koichi Kise, whose keynote speech will address all of us and congratulations also to all of you and those that are following our works form every place in the world where they are.



Good work to all.
by Prof. Sebastiano Impedovo (IAPR Fellow)
University of Bari, Italy
ICDAR'2015 Honorary Chair

Welcome Message from General Chairs

Welcome to the 2015 International Conference on Document Analysis and Recognition in Nancy, France. It is truly an honor to host our premier conference. This conference was originally planned, and fully organized to take place in Tunis, Tunisia. Sadly, for safety reasons following the terrorist attacks in Tunisia, the conference was relocated to Nancy, France before less than two months. It is saddening that terrorism and obscurantism has its way and deprives the document analysis community from discovering the beautiful country and culture of Tunisia. You will always be welcome in Tunisia!

ICDAR'2015 is the thirteen biennial meeting of our international research community which began in St. Malo, France in 1991. Since that time, we have met in Japan ('93), Canada ('95), Germany ('97), India ('99), Washington ('01), UK ('03), Korea ('05), Brazil ('07), Spain ('09), China ('11) and most recently in Washington ('13). ICDAR'2015 continues a long tradition of providing state-of-the-art snapshots of the research advances in our field and we hope that you will benefit from all that the conference has to offer, both technically and socially.

This year's conference will be highlighted by four keynote talks, 88 oral presentations and 139 poster presentations over three days. In conjunction with the conference, we are proud to continue the ICDAR Doctoral Consortium which will pair the next generation of researchers with top mentors in our field. The conference will also host a series of workshops aimed at the focused study of cutting-edge problems in our field, and researchers will have the opportunity to learn the results of numerous competitions that are driving interest in the community. We hope that this conference will provide a forum for generating an increased interest on scholarship within the field of document analysis and recognition.

As anyone who has taken on the responsibility of hosting ICDAR or other large conferences knows, success depends almost exclusively on the team of volunteers who tirelessly work on the program, infrastructure, and facilities. We would first like to thank the program co-chairs, who have worked to put together a first-class technical program. We would also like to thank the chairs of the workshops, tutorials, doctoral consortium, competitions, publicity, publications, finance and local organizing committee for their help and support. We gratefully acknowledge sponsors chairs for attracting sponsors which helps to offset costs and provide various awards for exemplary research. Finally, special thanks to Haikal El Abed and Habib M. Kammoun for their overall coordination, and for Abdel Belaïd and Bart Lamiroy for having accepted the challenge to finally host the conference in Nancy 2 months before the event.

It is a pleasant duty to thank the REGIM Laboratory and the Tunisian IAPR society (Association S.I.T) for their organizing effort; and especially the support of the ICDAR advisory board and the supportive local institutions: University of Lorraine, INRIA, LORIA, and Institut Français in Tunisia for making this relocation a reality.

Last but not least, we would like to extend our feelings of gratitude to the document analysis community. Without their whole hearted commitment and encouragement, this event would not have been possible.

We look forward to you joining us in making this conference a memorable event for decades to come. We wish all the attendees an enjoyable participation and a wonderful time in Nancy! We hope that you will take time to enjoy the cultural and historic sites the city has to offer, only minutes from the conference venue.

by Adel M. Alimi (Tunisia), Volker Märgner (Germany), and Jean-Marc Ogier (France)
ICDAR'2015 General Chairs

Welcome Message from Technical Program Chairs

We are very pleased to present the technical program we have prepared for this 13th edition of ICDAR. We are so pleased to have received over 400 submissions (488 summaries submitted and 401 complete submissions in the end). The papers were submitted from 46 countries across the 5 continents: Africa (6 countries / 50 papers), Americas (4 countries / 35 papers), Asia (20 countries / 173 papers), Australia (1 country / 3 papers), and Europe (15 countries/140 papers).

In order to improve the quality of submissions as well the review process, we, as Technical Program Chairs, decided to organize this ICDAR'2015 edition into "areas". The topics of ICDAR were divided into areas, and the authors were instructed to submit their papers to the appropriate area. Each area was chaired by two chairs. Eight areas were created: (1) Character and symbol recognition, (2) Printed/Handwritten text recognition, (3) Graphics analysis and recognition, (4) Document analysis (5) Document understanding, (6) Historical documents and digital libraries, (7) Document based forensics, (8) Camera and video based scene text analysis. The distribution of 401 papers along with the assigned reviewers over the 8 areas is as follows: area 1: (45 papers / 12 reviewers), area 2: (106 papers / 28 reviewers), area 3: (24 papers / 7 reviewers), area 4: (81 papers / 18 reviewers), area 5: (48 papers / 12 reviewers), area 6: (40 papers / 14 reviewers), area 7: (26 papers / 7 reviewers) and area 8: (31 papers / 9 reviewers).

The area chairs mediated between the TP chairs and the PC Members, and had the mission to carefully monitor the reviewing process, such as pre-filtering of questionable papers, examining the reviews, exchanging views with PC members during rebuttal, solving possible contradictions between reviews, and preparing a meta-review for the TP chairs. Thus, each area contained a smaller number of papers belonging to the same theme, which could ensure better control of the quality of submissions and reviews. The role of the TP chairs was to manage the exchange with the authors and to send notifications. In addition, another nice feature was adopted for the second time in this ICDAR'2015 Edition: allocation of a period of rebuttal to allow the authors to respond to the reviewers' comments and concerns. The PC members had the ability to change or they could maintain their reviews. All these were done under the sharp eyes and coordination of the area chairs.

As part of the pre-screening three types of control were introduced in this ICDAR'2015 Edition: plagiarism, out of scope and non-conformity of the format. All papers were processed through an automatic plagiarism checker. The area chairs were instructed to examine the paper titles and abstracts, and when necessary the papers, to verify the topics were appropriate to ICDAR, and that the length and style were within the prescribed format specifications (primarily length). This reduced the number of papers assigned to the reviewers, and reduced the workload of the reviewers during the reviewing period. 52 papers were rejected during this screening process: 35 during the pre-screening and 17 afterwards, 13 for plagiarism, 26 for out-of-scope, and 13 for the non-conformity of the format.

Regarding the review process, the program committee was composed of 107 active colleagues in the scientific community from 23 countries. To this, were added 172 sub reviewers. For each paper, 3 reviews were requested, resulting in a total of 1,318 reviews. If reviews were missing on some papers, the area chairs assigned those to others reviewers or read the papers themselves. In case of conflicting reviews, here also, the area chairs asked for explanations from the reviewers and mediated between them. The area chairs also monitored the depth of the provided reviews and in many cases encouraged the reviewers to elaborate on their findings.

The results are overall good, maintaining a very decent selection level for a conference of rank A like ICDAR. From the results of each area, the area chairs sorted the papers into 6 categories: oral, probably oral, poster, probably poster, probably reject and reject. We selected 90 oral papers and 144 posters. 167 papers were rejected. In terms of rates, this gives 58.3% acceptance (22.4% oral, 35.9% poster) and 41.7% rejection. The papers accepted as oral will be presented in 17 sessions of 4, 5 or 6 papers per session. Papers accepted as posters will be presented in 3 sessions. Each poster session includes papers from all areas to keep consistency in the presentations.

The acceptance results per area are (#submissions/total acceptance): area 1: (45/22), area 2 (106/71), area 3 (24/11), area 4 (81/40), area 5 (48/30), area 6 (40/24), area 7 (26/18) and area 8 (31/17).

Similarly, the results per continent are (#submissions/total acceptance): Africa (49/15), Americas (35/15), Asia (173/97), Australia (3/3) and Europe (139/104).

Finally, we would like to take this opportunity to thank all the area chairs for their careful and effective help. Their insight has allowed us to better control the reviewing process and achieve a good level of selection. We are also grateful to all the reviewers and sub-reviewers who were active and have often made very relevant reviews.

Abdel Belaïd, Bidyut B. Chaudhuri, Mohamed Cheriet
ICDAR'2015 Technical Program Chairs

Organizing Committee



Honorary Chair

Sebastiano Impedovo
University of Bari, Italy
impedovo@di.uniba.it

General Chairs



Adel M. Alimi
University of Sfax, Tunisia
adel.alimi@ieee.org



Volker Märgner
Technische Universität
Braunschweig, Germany
maergner@ifn.ing.tu-bs.de



Jean-Marc Ogier
University of La Rochelle, France
jean-marc.ogier@univ-lr.fr

Executive Chair



Haikal El Abed
GIZ, Technical Trainers College
Saudi Arabia
elabed@ieee.org

Program Chairs



Abdel Belaïd
University of Lorraine, France
abdel.belaïd@loria.fr



Bidyut B. Chaudhuri
Indian Statistical Institute, India
bbc@isical.ac.in



Mohamed Cheriet
ETS, Canada
mohamed.cheriet@etsmtl.ca

Tutorials Chairs



Venu Govindaraju
University at Buffalo, USA
venu@cubs.buffalo.edu

Marcus Liwicki
Research Center for Artificial
Intelligence, Germany
liwicki@dfki.uni-kl.de



Workshops Chairs



Laurence Likforman-Sulem
Telecom Paris Tech, France
laurence.likforman@telecom-
paristech.fr

Seiichi Uchida
Kyushu University, Japan
uchida@ait.kyushu-u.ac.jp



Competitions Chairs



Apostolos Antonacopoulos
University Salford, United
Kingdom a.antonacopoulos
@primaresearch.org



Umapada Pal
Indian Statistical Institute, India
umapada@isical.ac.in



Liu Wenyin
City University Hong Kong,
Hong Kong
csluwy@cityu.edu.hk

Publicity Chairs



Michael Blumenstein
Griffith University, Australia
m.blumenstein@griffith.edu.au

Josep Lladós
University Autònoma Barcelona,
Spain
josep.llados@cvc.uab.es



Sponsors & Exhibitions Chairs



Rolf Ingold
University Fribourg, Switzerland
rolf.ingold@unifr.ch

Andreas Dengel
DFKI, Kaiserslautern, Germany
andreas.dengel@dfki.de



Doctoral Consortium Chairs



Alicia Fornes
University Autònoma Barcelona,
Spain
afornes@cvc.uab.es

Gernot A. Fink
Technische Universität Dortmund,
Germany
gernot.fink@tu-dortmund.de



Publication Chair



Mohamed Ben Halima
University of Gabes, Tunisia
mohamed.benhalima@ieee.org

Local Organizing Chair

Ali Wali
University of Sfax, Tunisia
ali.wali@ieee.org



Finance Chairs



Habib M. Kammoun
University of Sfax, Tunisia
habib.kammoun@ieee.org

Mohamed Neji
University of Gabes, Tunisia
mohamed.neji@ieee.org



Technical Program Committee

Area 1 (Character & Symbol Recognition) Chairs:

Apostolos Antonacopoulos, *Univ. Salford, UK*

Thierry Paquet, *Univ. Rouen, France*

Area 2 (Printed/Handwritten Text Recognition) Chairs:

Andreas Dengel, *DFKI, Germany*

Laurence Likforman-Sulem, *Telecom Paris Tech, France*

Area 3 (Graphics Analysis & Recognition) Chairs:

Michael Blumenstein, *Univ. Griffith, Australia*

Bart Lamiroy, *LORIA, France*

Area 4 (Document Analysis) Chairs:

Elisa Barney-Smith, *Boise State Univ., USA*

Ergina Kavallieratou, *Univ. Aegean, Greece*

Area 5 (Document Understanding) Chairs:

Koichi Kise, *Osaka Prefecture Univ., Japan*

Umapada Pal, *Indian Statistical Inst., India*

Area 6 (Historical Documents & Digital Libraries) Chairs:

Najoua Ben Amara, *Univ. Sousse, Tunisia*

Josep Lladós, *Univ. Autònoma Barcelona, Spain*

Area 7 (Document based Forensics) Chairs:

Venu Govindaraju, *Univ. at Buffalo, USA*

Marcus Liwicki, *AI Research Center, Germany*

Area 8 (Camera & Video based Scene Text Analysis) Chairs:

Masakazu Iwamura, *Osaka Prefecture Univ., Japan*

Chew Lim Tan, *National Univ. of Singapore, Singapore*

Technical Program Committee Members:

Alaei Alireza, *Univ. François-Rabelais Tours, France*

Somaya Al-Maadeed, *Qatar Univ., Qatar*

Eric Anquetil, *IRISA – INSA, France*

Thierry Artieres, *LIP6, Univ. Paris 6, France*

Sabine Barrat, *Univ. Tours, France*

Hala Bezine, *Univ. Sfax, Tunisia*

Chakravarthy Bhagvati, *Univ. Hyderabad, India*

Anders Brun, *Uppsala Univ., Sweden*

Tien Bui, *Concordia University, Canada*

Syed Saqib Bukhari, *DFKI, Germany*

Jean-Christophe Burie, *Univ. La Rochelle, France*

Jin Chen, *Lehigh University, USA*

Youssef Chherawala, *Synchromedia Lab, Canada*

Luigi P. Cordella, *Univ. Napoli Federico II, Italy*

Bertrand Coüasnon, *Irisa / Insa, France*

Mathieu Delalandre, *Univ. Tours, France*

Nachum Dershowitz, *Tel Aviv Univ., Israel*

Fadoua Drira, *Univ. Sfax, Tunisia*

Jihad Elsana, *Univ. Negev Beer-Sheva, Israel*

Véronique Eglin, *LIRIS-INSA de Lyon, France*

Reza Farrahi Moghaddam, *Synchromedia Laboratory, ETS, Canada*

Gernot Fink, *TU Dortmund Univ., Germany*

Andreas Fischer, *Ecole Polytechnique de Montreal, Canada*

Alicia Fornés, *Computer Vision Center, UAB, Spain*

Volkmar Frinken, *Kyushu University, Japan*

Djamel Gaceb, *LIRIS-INSA de Lyon, France*

Utpal Garain, *Indian Statistical Inst., India*

Basilis Gatos, *Inst. of Informatics and Telecommunications, NCSR Demokritos, Greece*

Eric Granger, *ETS, Canada*

Tarek M. Hamdani, *Taibah Univ., Saudi Arabia*

Rachid Hedjam, *Synchromedia, Canada*

Jean Hennebert, *Univ. Fribourg, Switzerland*

Pierre Héroux, *Univ. Rouen, France*

Laurent Heutte, *Univ. Rouen, France*

Jonathan Hull, *Ricoh Innovations California Research Center, USA*

Qiang Huo, *Microsoft Research Asia, China*

C.V. Jawahar, IIIT, Hyderabad, India
Lianwen Jin, South China Univ. Technology, China
Afef Kacem, UTIC, ESSTT, Tunisia
Dimosthenis Karatzas, Computer Vision Centre, Spain
Christopher Kermorvant, A2iA Paris, France
Monji Kherallah, Univ. Sfax, Tunisia
Soo-Hyung Kim, Chonnam National U., Republic of Korea
Ale Koerich, PUCPR, Brazil
Young-Bin Kwon, Chung-Ang Univ., Republic of Korea
Franck Lebourgeois, LIRIS-INSa Lyon, France
Aur lie Lemaitre, IRISA, Univ. Rennes 2, France
Rafael Dueire Lins, Cidade Univ., Brazil
Cheng-Lin Liu, Inst. of Automation, China
Daniel Lopresti, Lehigh Univ., USA
Georgios Louloudis, Inst. of Informatics and Telecommunications, NCSR Demokritos, Greece
Shijian Lu, Inst. Infocomm Research, Singapore
Tong Lu, Nanjing Univ., China
Muhammad Imran Malik, DFKI, Germany
Muhammad Muzzamil Luqman, U. La Rochelle, France
Driss Mammass, Ibn Zohr Univ., Morocco
Raghavan Manmatha, Univ. Massachusetts, USA
Angelo Marcelli, DIEM – Univ. Salerno, Italy
Simone Marinai, University Florence, Italy
Ikram Moalla, LIRIS / Univ. Sfax, Tunisia
Hiroshi Murase, Nagoya Univ., Japan
Panduranga Nagabhushan, Univ. Mysore, India
Masaki Nakagawa, Tokyo Univ. of Agri.& Tech., Japan
Sourour Njah, Univ. Sfax, Tunisia
Il-Seok Oh, Chonbuk National Univ., Korea
Wataru Ohyama, Mie University, Japan
Luiz Oliveira, UFPR, UK
Shinichiro Omachi, Tohoku Univ., Japan
Palaiahnakote Shivakumara, Univ. Malaya, Malaysia
Liangrui Peng, Tsinghua University, China

Giuseppe Pirlo, Univ. Bari Aldo Moro, Italy
R jean Plamondon, Univ. Montreal, Canada
Vincent Poulain D’Andecy, ITESOFT, France
Ioannis Pratikakis, DUTH, Greece
Lionel Prevost, Univ. Antilles Guyane, France
Nicolas Ragot, Univ. Tours, France
Jean-Yves Ramel, Univ. Francois-Rabelais, France
Sheikhfaisal Rashid, Technical U. Kaiserslautern, Germany
Oriol Ramos Terrades, Univ. Aut noma Barcelone, Spain
Kaspar Riesen, U. Applied Sciences & Arts, Switzerland
Partha Roy, Samsung, India
Mar al Rusi ol, Univ. Aut noma Barcelona, Spain
Robert Sablatnig, Vienna Univ. of Technology, Austria
Prateek Sarkar, Google, USA
Lambert Schomaker, Univ. Groningen, The Netherlands
Srirangaraj Setlur, Univ. at Buffalo, USA
Faisal Shafait, Univ. Western Australia in Perth, Australia
Samia Snoussi Maddouri, ENIT, Tunisia
Sargur Srihari, CEDAR, Univ. at Buffalo, USA
Bolan Su, Inst. Infocomm Research, Singapore
Jun Sun, Fujitsu R&D Center, China
Salvatore-Antoine Tabbone, LORIA, France
Kengo Terasawa, Future Univ. Hakodate, Japan
Karl Tombre, Univ. Lorraine, France
Szilard Vajda, Nat. Library of Medicine, USA
Ernest Valveny, UAB, Spain
Christian Viard-Gaudin, Univ. Nantes, France
Enrique Vidal, UPV, Spain
Nicole Vincent, Univ. Paris 5 Descartes, France
Liu Wenyin, City Univ. Hong Kong, Hong Kong
Lior Wolf, Tel Aviv Univ., Israel
Safwan Wshah, State Univ. Buffalo, USA
Pingping Xiu, Microsoft, USA
Su Yang, Fudan Univ., Japan
Richard Zanibbi, Rochester Inst. Technology, USA

Venue

The conference will be organized in the congress center “Prouvé” situated in the city of Nancy.

GRAND NANCY CONGRÈS & ÉVÈNEMENTS

Address: 1 place de la République, CS 60663
54063 NANCY Cedex

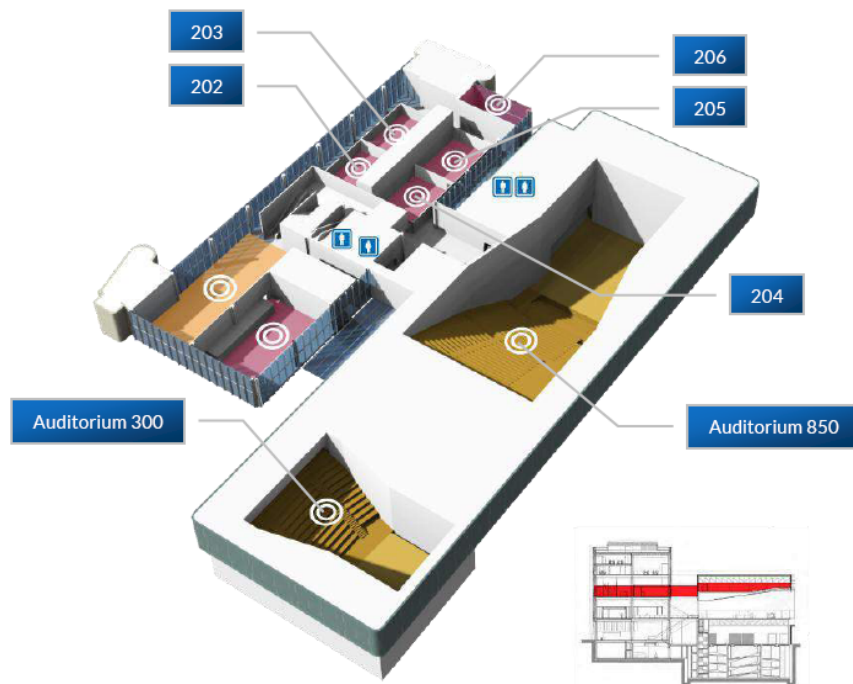
Phones: +33 (0)3 83 30 8000
+33 (0)3 83 30 8000

E-mail: info@grandnancy-congresetevenements.com

Website: www.grandnancy-congresetevenements.com



LEVEL 2



Practical Information

REGISTRATION

Opening hours

Monday, August 24, 2015 08:00 – 18:00

Tuesday, August 25, 2015 08:00 – 18:00

Wednesday, August 26, 2015 08:00 – 18:00

Registration includes

- Attendance of the technical program on Monday Tuesday, and Wednesday.
- Lunches and coffee breaks.
- Attendance of Doctoral Consortium.
- Attendance to the social events.

Registration excludes

- Workshops.
- Hotel booking.
- Breakfasts and dinners.

INSTRUCTIONS FOR PRESENTERS

Oral Presentations

Oral presenters will have 20 minutes for their presentations (approximately 16 minutes for the talk, and 4 minutes for questions).

Please make sure you introduce yourself to the session chair and you upload your presentation in the lecture room where your talk will take place, at least 10 minutes prior to the beginning of your session.

A computer and a data projector will be available. Please bring your presentation on a USB memory stick. Accepted file formats are MS-Power Point PPT and Adobe PDF.

Speakers can use their own computers for the presentation. This option is not recommended if the presentation is a standard PPT or PDF file.

The registration desk will be available for speakers requiring assistance with format conversions, file upload etc.

When your session is over, your presentation will be deleted from all computers, no copies or backups will be made.

Poster Presentations

Poster board should be printed in A0 paper size Portrait mode, 33 inches wide by 46 inches tall (84 cm * 118 cm). They will be pinned to free standing board.

You will be expected to display and present your poster at least 10 minutes prior to the beginning of the assigned session.

If you have more than one poster in a given session, please make arrangements to have someone else present your second poster because logistics prevent us from moving posters around.

General Information

Currency

The official currency of the France is the Euro (€). International credit cards are accepted for payments in most hotels, restaurants and shops. ATM machines are easily available throughout the city.

Wi-Fi

Free Internet Wi-Fi will be available at the Congress Centre Prouvé during the whole conference.

Insurance

The Organizers of the Conference do not accept liability for any injury, loss or damage, arising from accidents or other situations during, or as a consequence of the Conference. Participants are therefore advised to arrange insurance for health and accident prior to travelling to the Conference.

Language

The official language of the Conference is English. Simultaneous interpretation is not provided.

Message System

The Message Board is located in the Registration Area. There you may leave a message for your friends or colleagues.

Mobile Phones

Delegates are kindly requested to switch off their mobile phones during the sessions.

Program Changes

The organizers cannot assume liability for any changes in the program due to external or unforeseen circumstances.

Smoking Policy

Smoking is not allowed inside the building and in all public places.

Staff

Conference staff will be happy to assist to participants during the Conference.

GOOD TO KNOW

Electricity: France uses a 230 volt 50 Hz system.

Shopping: Most shops in Nancy are open from 9:30am to 7:00pm, Monday through Saturday.

SOCIAL EVENTS

Welcome Reception

Where: Grand Salon, City Hall, Nancy

When: Monday 24, 2015 at 6:30pm – 8:30pm

Visit

Where: Museum of Fine Arts of Nancy

When: Monday 24, 2015 at 8:30pm – 10:30pm

Conference Dinner

Where: Panoramique 290, Prouvé Congress Center

When: Tuesday 25, 2015 at 8:00pm – 11:00pm

The Gala dinner ticket is mandatory to access to the dinner.

Urgency

If you need any urgent help during your stay in France, don't hesitate to call **Prof. Abdel BELAID** (+33 6 01 23 50 45).

Emergency Info: Police: 17 - Ambulance: 15.

We wish you a pleasant stay in France!

Mobile Apps



ICDAR 2015 with the **Whova** App

Benefits:

- Explore the **professional profiles** of event speakers and attendees
- Send **in-app messages**
- Scan and exchange **business cards**
- Easily **discover people** with common professional backgrounds
- Receive update **notifications** from organizers
- Access **agenda**, GPS guidance, maps, and parking directions



Get “**Whova**” from the App Store or Google Play. Please sign up for the app with **your social media account or email**. If you are asked to enter an event-specific passcode, please enter **icdar2015**



13th ICDAR'2015 - Program at a Glance

August 23–26, 2015, Prouvé Congress Center, Nancy, France [relocated from Tunisia]

		24 August 2015	25 August 2015		26 August 2015
8:00 - 8:50	Workshops: GREC (22-23 August) [room Gambetta], HIP (22 August) [room Gallé], CBDAR+MOCR+AFHA (23 August) [room Majorelle], Doctoral Consortium (23 August) [room Gallé] (in Brasserie Excelsior – 350m from Prouvé congress center)	Registration	Registration		Registration
8:50 - 9:20		Opening and IAPR/ICDAR Award Ceremony [auditorium 300]	Online Handwriting [room 202] Word Spotting II [auditorium 300] Document Analysis II [room 204]	8:30 - 9:30	Poster session 3 [salon 200]
9:20 - 10:10		IAPR/ICDAR Award Lecture Prof. Venu Govindaraju (USA) [auditorium 300]	Keynote Prof. Philippe Cudre-Mauroux (Switzerland) [auditorium 300]	9:30 - 9:50	Coffee break [salon 200]
10:10 - 10:30		Coffee break [foyer 300]	Coffee break [foyer 300]	9:50 - 11:10	Syntactic/Semantic Analysis [room 201]
10:30 - 12:30		Historical Document Processing [room 202] Printed/Handwritten: Recurrent Neural Networks / Convolutional Neural Networks [auditorium 300] Document based Forensics [room 204]	Graphics Analysis and Recognition [room 202] Printed/Handwritten: Recurrent Models [auditorium 300] Document Analysis III [room 204]	11:10 - 12:30	Printed/Handwritten: Visual Scene Analysis [room 201]
12:30 - 13:50		Lunch [foyer 300]	Lunch [foyer 300]	12:30 - 14:00	Lunch [salon 200]
13:50 - 14:40		Keynote Dr. David Doermann (USA) [auditorium 300]	Keynote Prof. Koichi Kise (Japan) [auditorium 300]	14:00 - 14:30	ICDAR 2019 proposals [room 201]
14:40 - 15:40		Poster session 1 [foyer 300]	Poster session 2 [foyer 300]	14:30 - 16:30	Competitions [room 201]
15:40 - 16:00		Coffee break [foyer 300]	Coffee break [foyer 300]		
16:00 - 18:00		Word Spotting I / Text detection [room 202] Printed/Handwritten: Convolutional Neural Network / Deep Learning [auditorium 300] Document Analysis I [room 204]	Printed/Handwritten: Script-Vocabulary Recognition [room 202] Printed/Handwritten: Applications [auditorium 300] Document Understanding [room 204]	16:30 - 17:00	Awards presentation, Closing, & group photo [room 201]
		18:30-20:30 Welcome reception [grand salon, City Hall]	20:00-23:00 Gala Dinner [panoramique 290]		

Workshops:

- **11th International Workshop on Graphics Recognition (GREC'2015)**
 - Organizers:
 - Najoua Essoukri Ben Amara (ENISO, SAGE Unit, Tunisia)
 - Jean-Marc Ogier (Université de la Rochelle, L3i, France)
- **6th International Workshop on Camera Based Document Analysis and Recognition (CBDAR'2015)**
 - Organizers:
 - Dimosthenis Karatzas (Univ. Autonoma de Barcelona, Spain)
 - Faisal Shafait (University of Western Australia)
- **5th International Workshop on Multilingual OCR (MOCR'2015)**
 - Organizers:
 - Venu Govindaraju (University at Buffalo, SUNY)
 - Prem Natarajan (BBN Technologies, MA)
 - Santanu Chaudhury (IIT, Delhi, India)
 - Srirangaraj Setlur (University at Buffalo, SUNY)
 - Huaigu Cao (Raytheon BBN Technologies, USA)
 - Safwan Weshah (Xerox Research, USA)
- **4th Int. Workshop on Automated Forensic Handwriting Analysis (AFHA'2015)**
 - Organizers:
 - Muhammad Imran Malik (DFKI-Kaiserslautern, Germany)
 - Marcus Liwicki (TU-Kaiserslautern, Germany)
 - Michael Blumenstein (Griffith Uni., Australia)
 - Angelo Marcelli (Uni. of Salerno, Italy)
 - Linda Alewijnse (NFI, the Netherlands)
 - Charles Berger (NFI, the Netherlands)
 - Bryan Found (Victoria Police, Australia)
- **3rd International Workshop on Historical Document Imaging and Processing (HIP'2015)**
 - Organizers:
 - Bertrand Coüasnon (Irisa / Insa, France)
 - Bill Barrett (Brigham Young University, USA)
 - Volkmar Frinken (Kyushu University, Japan)
 - Hamid Amiri (ENIT, Tunisia)
 - Volker Märgner (Technische Universität Braunschweig, Germany)

Doctoral Consortium

Time: 14:00 – 18:00

Location: room Gallé, Brasserie Excelsior (350m from Prouvé congress center)

Chairs: Alicia Fornes (Computer Vision Center, Spain), Gernot A. Fink (Technische Univ. Dortmund, Germany)

-
- | | |
|--------------|---|
| #dc01 | Handwriting Recognition of Historical Documents
Núria Cirera
<i>Autonomous University of Barcelona, Spain</i> |
| #dc02 | Information spotting in huge repositories of scanned document images
Quoc Bao Dang
<i>University of La Rochelle, France</i> |
| #dc03 | Semantic hashing for hybrid documents
Sébastien Eskenazi
<i>University of La Rochelle, France</i> |
| #dc04 | Word Spotting and Recognition in Images from Heterogeneous Sources
Suman Ghosh
<i>Autonomous University of Barcelona, Spain</i> |
| #dc05 | Image Document Analysis of Palm Leaf Manuscripts
Made Windu Antara Kesiman
<i>University of La Rochelle, France</i> |
| #dc06 | Automatic Comics Analysis, Annotation and Indexing Using Graph-based Approach
Thanh Nam Le
<i>University of La Rochelle, France</i> |
| #dc07 | A structural method based on texture for ancient document image analysis
Maroua Mehri
<i>University of La Rochelle, France</i> |
| #dc08 | Detection, localization and typing of text in heterogeneous document images with deep neural networks
Bastien Moysset
<i>INSA Lyon, France</i> |
| #dc09 | Sequential Labeling for Recognition of Image Based Patterns
Anupama Ray
<i>Indian Institute of Technology Delhi, India</i> |
| #dc10 | Graph-based Word Spotting
Pau Riba
<i>Autonomous University of Barcelona, Spain</i> |
| #dc11 | Deep Learning Methods for Robust Historical Documents Analysis
Mathias Seuret
<i>University of Fribourg, Switzerland</i> |
| #dc12 | Towards Generic Printed OCR
Adnan Ul-Hasan
<i>University of Kaiserslautern, Germany</i> |
| #dc13 | Artificial Arabic Text Detection, Tracking and Recognition in News Videos
Oussama Zayene
<i>University of Sousse, Tunisia</i> |

Plenary Talk 1

Time: Monday, August 24, 2015, 09:20 – 10:10

Location: Auditorium 300

Chair: Réjean Plamondon (Ecole Polytechnique de Montreal, Canada)

Accelerated Discovery: A Big Data Perspective

Venu Govindaraju

University Buffalo, USA

2015 IAPR/ICDAR Outstanding Achievements Award Winner



Abstract. Today, the advances in computing, storage, and machine learning algorithms make it possible for the entire scientific literature of any given field to be examined in its totality, so that papers across topics, years, authors, disciplines, and institutions can reveal linkages that have been thus far unapparent and which could lead to transformational discoveries. We present a vision for the ICDAR community to address this grand challenge by proposing a framework that would scale across disciplines and accelerate the entire process of scientific endeavor and discovery. Two major hurdles need to be overcome. First is the issue of the sheer volume of scientific literature in existence to date, which is conservatively pegged at nearly 100 million articles. The literature itself comes in a wide variety of formats, is of varying quality (necessitating assessment of the veracity of data and results), and continues to grow at a staggering rate (velocity). So, ironically, the body of scientific articles that typically present the analysis of data, themselves qualify as “Big Data”. The second hurdle is the quality of scientific search currently supported by search engines, which merely make access more efficient but falls short at facilitating easier and comprehensive understanding of the topic of the search. We present a roadmap to address the myriad of research challenges to bridge this gap that is crucial to the process of scientific discovery.

Biography. Dr. Venu Govindaraju, SUNY Distinguished Professor of Computer Science and Engineering, is the founding director of the Center for Unified Biometrics and Sensors. He received his Bachelor’s degree with honors from the Indian Institute of Technology (IIT) in 1986, and his Ph.D. from UB in 1992. He has co-authored about 400 refereed scientific papers, and has supervised the dissertations of 30 doctoral students. He has served on the editorial boards of premier journals such as the IEEE Transactions on Pattern Analysis and Machine Intelligence and is currently the Editor-in-Chief of the IEEE Biometrics Council Compendium.

Oral Session 1: Historical Document Processing

Time: Monday, August 24, 2015, 10:30 – 12:30

Location: Room 202

Chair: Joseph Lladós (CVC, Universitat Autònoma de Barcelona, Spain)

- #058 Combining Handwriting and Speech Recognition for Transcribing Historical Handwritten Documents**
Emilio Granell and Carlos-D Martínez-Hinarejos
Universitat Politècnica de València, Spain
- #210 Blind Versus Unblind Performance Evaluation of Binarization Methods**
Amina Djema, Youcef Chibani, Abdenour Sehad and Et-Tahir Zemouri
USTHB, Algeria (will be presented by Hassiba Nemmour)
- #222 Effects of Clustering Algorithms on Typographic Reconstruction**
Elisa H. Barney Smith¹ and Bart Lamiroy²
¹ *Region 6 - NE Area Chair, USA*
² *Université de Lorraine-LORIA, France*
- #225 OCR performance prediction using cross-OCR alignement**
Ahmed Ben Salah¹, Jean-Philippe Moreux, Nicolas Ragot and Thierry Paquet²
¹ *Université de Rouen, France*
² *LITIS - Normandie University, France*
- #262 An Initial Study on the Construction of Ground Truth Binarized Images of Ancient Palm Leaf Manuscripts**
Made Windu Antara Kesiman, Sophea Prum, Jean-Christophe Burie and Jean-Marc Ogier
University of La Rochelle, France
- #011 A Polar Stroke Descriptor for Classification of Historical Documents**
Sheng He and Lambert Schomaker
University of Groningen, Netherlands

Oral Session 2: Printed/Handwritten: Recurrent Neural Networks / Convolutional Neural Networks

Time: Monday, August 24, 2015, 10:30 – 12:30

Location: Auditorium 300

Chair: Vincent Poulain d'Andecy (ITESOFT, France)

-
- #233** **Parallel Sequence Classification using Recurrent Neural Networks and Alignment**
Federico Raue, Wonmin Byeon, Thomas Breuel and Marcus Liwicki
University of Fribourg, Switzerland
- #117** **Bagging by Design for Continuous Handwriting Recognition Using Multi-Objective Particle Swarm Optimization**
Mahdi Hamdani, Patrick Doetsch and Hermann Ney
RWTH Aachen University, Germany
- #305** **Recognition of Historical Greek Polytonic Scripts Using LSTM Networks**
Fotini Simistira¹, Adnan Ul Hassan², Vassilis Papavassiliou, Basilis Gatos³, Vassilis Katsouros¹ and Marcus Liwicki⁴
¹ *Athena Research and Innovation Center, Greece*
² *University of Kaiserslautern, Germany*
³ *National Center for Scientific Research "Demokritos", Greece*
⁴ *University of Fribourg, Switzerland*
- #033** **Recognition Confidence Analysis of Handwritten Chinese Character with CNN**
Meijun He, Shuye Zhang, Huiyun Mao and Lianwen Jin
South China University of Technology, China
- #187** **Reconstruction Combined Training for Convolutional Neural Networks on Character Recognition**
Li Chen, Song Wang, Wei Fan, Jun Sun and Satoshi Naoi
Fujitsu R&D Center, China
- #046** **Multi-font Printed Chinese Character Recognition using Multi-pooling Convolutional Neural Network**
Zhuoyao Zhong, Lianwen Jin and Ziyong Feng
South China University of Technology, China

Oral Session 3: Document based Forensics

Time: Monday, August 24, 2015, 10:30 – 12:30

Location: Room 204

Chair: Seiichi Uchida (Kyushu University, Japan)

- #205 Localized Forgery Detection in Hyperspectral Document Images**
Zhipei Luo, Faisal Shafait and Ajmal Mian
University of Western Australia, Australia
- #223 Chinese Character-level Writer Identification using Path Signature Feature, DropStroke, and Deep CNN**
Weixin Yang, Lianwen Jin and Manfei Liu
South China University of Technology, China
- #251 Towards an Automatic On-Line Signature Verifier Using Only One Reference Per Signer**
Moises Diaz¹, Andreas Fischer², Réjean Plamondon³ and Miguel A. Ferrer
¹ *Universidad de Las Palmas de Gran Canaria, Spain*
² *University of Fribourg, Switzerland*
³ *École Polytechnique de Montréal, Canada*
- #110 Robust Score Normalization for DTW-Based On-Line Signature Verification**
Andreas Fischer¹, Moises Diaz², Réjean Plamondon³ and Miguel A. Ferrer
¹ *University of Fribourg, Switzerland*
² *Universidad de Las Palmas de Gran Canaria, Spain*
³ *École Polytechnique de Montréal, Canada*
- #312 Localized Document Image Change Detection**
Rajiv Jain and David Doermann
University of Maryland, USA
- #287 Sparsely Sampled Binary Patterns for writer identification**
Anguelos Nicolaou, Andrew David Bagdanov, Marcus Liwicki¹ and Dimosthenis Karatzas²
¹ *University of Fribourg, Switzerland*
² *Computer Vision Center - Barcelona, Spain*

Plenary Talk 2

Time: Monday, August 24, 2015, 13:50 – 14:40

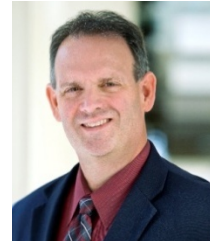
Location: Auditorium 300

Chair: Bidyut B. Chaudhuri (ISI, Kolkata, India)

The Role of Document Analysis in the Paperless Office: One perspective

David Doermann

Program Manager, Information Innovation Office (I2O)
DARPA, USA



Abstract. For decades we have been hearing of the demise of document understanding as a result of the “paperless office”, yet automation has actually created more paper than we had a dozen years ago. One question that we need to ask is “are we using paper the same way as we did before?” The fact is that the role of paper is shifting, and the type of document analysis tasks that are most relevant moving forward are shifting as well.

In recent years we have seen continued work on “conversion” to electronic representations, but we have also seen traditional document analytics applied to electronic representations themselves. For example, work has been published on indexing and retrieval of electronic sources from hard copy images as well as on the analysis of PDF and HTML layout structure. These problems are only a small part of a much larger need to extract information from material designed and organized for human, rather than machine, consumption.

This talk will highlight some of the current and evolving document analysis technologies that are required even in the offices of the future. These types of technologies won’t be rendered useless until we fundamentally change the definition of a “document”, which is not likely to occur nearly as quickly as some have predicted.

Biography. David Doermann is a member of the research faculty at the University of Maryland College Park. He received a B.Sc. degree in computer science and mathematics from Bloomsburg University in 1987, and a M.Sc. degree in 1989 in the Department of Computer Science at the University of Maryland, College Park. He continued his studies in the Computer Vision Laboratory, where he earned a Ph.D. in 1993. Since then, he has served as co-director of the Laboratory for Language and Media Processing in the University of Maryland’s Institute for Advanced Computer Studies and as an adjunct member of the graduate faculty.

His team of researchers focuses on topics related to document image analysis and multimedia information processing. Their recent intelligent document image analysis projects include page decomposition, structural analysis and classification, page segmentation, logo recognition, document image compression, duplicate document image detection, image-based retrieval, character recognition, generation of synthetic OCR data, and signature verification. In video processing, projects have centered on the segmentation of compressed domain video sequences, structural representation and classification of video, detection of reformatted video sequences, and the performance evaluation of automated video analysis algorithms.

In 2002, Dr. Doermann received an Honorary Doctorate of Technology Sciences from the University of Oulu for his contributions to digital media processing and document analysis research. He is a founding co-editor of the International Journal on Document Analysis and Recognition, has the general chair or co-chair of over a half dozen international conferences and workshops, and is the general chair of the International Conference on Document Analysis and Recognition (ICDAR) to be held in Washington DC in 2013. He has over 30 journal publications and over 160 refereed conference papers.

Dr. Doermann is currently on assignment with DARPA, the innovative funding arm of US government where he runs programs on translation, speech processing, visual media reasoning and media forensics.

Poster Session 1

Time: Monday, August 24, 2015, 14:40 – 15:40

Location: Foyer 300

Chair: Haikal El Abed (GIZ, Technical Trainers College, Saudi Arabia)

-- Arabic Text Recognition

- #030** **Arabic Handwritten Words Off-line Recognition based on HMMs and DBNs**
Akram Khemiri, Afef Kacem¹, Abdel Belaid² and Mourad Elloumi
1 ENSIT Université de Tunis, Tunisia
2 Université de Lorraine - LORIA, France
- #192** **Arabic handwritten document preprocessing and recognition**
Edgard Chammas¹, Chafic Mokbel and Laurence Likforman-Sulem²
¹ University of Balamand, Lebanon
² Institut telecom/Telecom ParisTech, France
- #270** **Hybrid Word/Part-of-Arabic-Word Language Models for Arabic Text Document Recognition**
Mohamed Faouzi Benzeghiba, Christopher Kermorvant and Jérôme Louradour
A2iA, France
- #297** **Multi-stage HMM based Arabic text recognition with rescoring**
Irfan Ahmad and Gernot Fink
TU Dortmund, Germany
- #373** **Arabic handwritten texts clusterization based on feature relation graph (FRG)**
Vladislav Pavlov and Dmitry Shalymov
Saint-Petersburg State University, Russian Federation

-- Document based Forensics

- #086** **Author Identification by Automatic Learning**
Jordan Frery, Christine Largeron and Mihaela Juganaru-Mathieu
Ecole Nationale Supérieure des Mines de St Etienne, France
- #091** **An Improved Artificial Immune Recognition System for Off-line Handwritten Signature Verification**
Yasmine Serdouk, Hassiba Nemmour and Youcef Chibani
USTHB, Algeria
- #136** **A Subtractive Clustering Scheme for Text-Independent Online Writer Identification**
Gautam Singh and Suresh Sundaram
Indian Institute of Technology Guwahati, India
- #196** **Subspace method with multi scale wavelet for recognition of printer property**
Takeshi Furukawa
Forensic Science Laboratory, Ibaraki Prefectural Police Headquarters, Japan
- #201** **Writer Identification from Offline Isolated Bangla Characters and Numerals**
Chandranath Adak and Bidyut B. Chaudhuri
Indian Statistical Institute, India

- #232 A Conditional Random Field Model for Font Forgery Detection**
Romain Bertrand¹, Oriol Ramos Terrades², Jean-Marc Ogier¹, Petra Gomez-Krämer
and Patrick Franco
¹ *University of La Rochelle, France*
² *Computer Vision Center - Barcelona, Spain*
- #322 Multilingual Signature Verification by Combined Segmentation Verification**
Wataru Ohyama, Yuuki Ogi, Tetsushi Wakabayashi and Fumitaka Kimura
Mie University, Japan
- #363 Writer Identification Using VLAD Encoded Contour-Zernike Moments**
Vincent Christlein, David Bernecker and Elli Angelopoulou
University Erlangen-Nuremberg, Germany

-- Document Image Analysis

- #032 Binarizing Complex Scanned Documents**
Rafael Lins, Gabriel Silva and Marcos Martins de Almeida
Federal University of Pernambuco, Brazil
- #143 A Multiple-Expert Binarization Framework for Multispectral Images**
Reza Farrahi Moghaddam and Mohamed Cheriet
Univeristy of Quebec's ETS, Canada
- #358 Confidence Measures for Seamless Skew and Orientation Detection in Document Images**
Iuliu Konya, Stefan Eickeler and Christian Brandt
Fraunhofer IAIS, Germany
- #477 A new automatic framework for document image enhancement process based on anisotropic diffusion**
Mohamed Riad Yagoubi, Amina Serir and Azeddine Beghdadi
USTHB, Algeria (will be presented by Hassiba Nemmour)
- #485 Ink separation and visualisation in ancient manuscripts: Application of hyperspectral imaging**
Sony George and Jon Yngve Hardeberg
Gjøvik University College, Norway

-- Document Segmentation

- #016 A Recognition based Approach for Segmenting Touching Components in Arabic Manuscripts**
Nabil Aouadi, Afef Kacem¹ and Abdel Belaid²
¹ *ENSIT Université de Tunis, Tunisia*
² *Université de Lorraine - LORIA, France*
- #126 Goal-Oriented Performance Evaluation Methodology for Page Segmentation Techniques**
Nikolaos Stamatopoulos, Georgios Louloudis and Basilis Gatos
National Center for Scientific Research "Demokritos", Greece

- #129 Table Structure Extraction in Handwritten Chemistry Documents**
Nabil Ghanmi and Abdel Belaid
Université de Lorraine - LORIA, France
- #161 Document Skew Detection Based on Hough Space Derivatives**
Felix Stahlberg and Stephan Vogel
Qatar Computing Research Institute, Qatar
- #245 A Semi-Automatic Groundtruthing Tool for Mobile-Captured Document Segmentation**
Joseph Chazalon¹, Marçal Rusiñol², Jean-Marc Ogier¹ and Josep Lladós²
¹ *University of La Rochelle, France*
² *Computer Vision Center, Spain*
- #279 Automatic and interactive rule inference without ground truth**
Ceres Carton, Aurélie Lemaitre and Bertrand Coüasnon
Irisa - University Rennes 2, France
- #281 Word Segmentation Using Wigner-Ville Distribution**
Ergina Kavallieratou
University of the Aegean, Greece
- #327 Simplifying the Reading of Historical Manuscripts**
Abedelkadir Asi, Rafi Cohen, Klara Kedem and Jihad El-Sana
Ben-Gurion University of the Negev, Israel
- #335 No threshold, no parameter. A prelude.**
Sébastien Eskenazi, Petra Gomez-Krämer and Jean-Marc Ogier
University of La Rochelle, France
- #370 The ENP Image and Ground Truth Dataset of Historical Newspapers**
Christian Clausner, Stefan Pletschacher, Christos Papadopoulos and Apostolos Antonacopoulos
PRImA - University of Salford, United Kingdom
- #448 A Performance Evaluation of NSHP-HMM based on conditional zone observation probabilities: Application to offline handwriting word recognition**
Hanene Boukerma, Christophe Choisy, Abdallah Benouareth and Nadir Farah
Ecole Normale Supérieure de l'Enseignement Technologique (ENSET), Skikda, Algeria

-- Graphics Analysis and Recognition

- #020 Towards a SignWriting Recognition System**
Diego Stiehl, Luiz S. Oliveira, Cayley Guimarães and Alceu S. Britto Jr
Pontifical Catholic University of Parana, Brazil
- #073 Document Analysis by a Mobile Robot for Autonomous Indoor Navigation**
Dalia Marcela Rojas Castro, Arnaud Revel and Michel Ménard
University of La Rochelle, France
- #156 Speech balloon and speaker association for comics and manga understanding**
Christophe Rigaud¹, Nam Le Thanh¹, Jean-Christophe Burie¹, Jean-Marc Ogier¹, Motoi Iwata, Eiki Imazu and Koichi Kise²
¹ *University of La Rochelle, France*
² *Osaka Prefecture University, Japan*

-- Document Understanding

- #052** **Classification of Forms with Similar Layouts by Using the Mixed Gaussian Weighted Mask (MGWM)**
Simeng Wang, Liangcai Gao and Yuehan Wang
Peking University, China
- #124** **Classifier Self-Assessment: Active Learning and Active Noise Correction for Document Classification**
Dominik Henter, Armin Stahl, Markus Ebbecke and Michael Gillmann
Insiders Technologies GmbH, Germany
- #141** **Automatic Annotation Extension and Classification of Documents Using a Probabilistic Graphical Model**
Abdessalem Bouzaïeni, Sabine Barrat and Salvatore Tabbone
Université de Lorraine - LORIA, France
- #443** **Supporting Early Contextualization of Textual Content in Digital Documents on the Web**
Bahaa Eldesouky, Menna Bakry, Heiko Maus and Andreas Dengel
DFKI - German Research Center for Artificial Intelligence, Germany
- #445** **A Hybrid Approach to Discover Semantic Hierarchical Sections in Scholarly Documents**
Suppawong Tuarob, Prasenjit Mitra and C. Lee Giles
Qatar Computing Research Institute, HBKU, Qatar

-- Convolutional/Recurrent Network Models

- #044** **Text-independent Writer Identification Using SIFT Descriptor and Contour-directional Feature**
Yu-Jie Xiong, Ying Wen, Patrick S.P. Wang and Yue Lu
East China Normal University, China
- #153** **A combined Convolutional Neural Network and Dynamic Programming approach for text line normalization**
Joan Pastor-Pellicer, Salvador España-Boquera, Maria Jose Castro-Bleda and Francisco Zamora-Martínez
Universitat Politècnica de València, Spain
- #170** **Segmented Handwritten Text Recognition with Recurrent Neural Network Classifiers**
Bolan Su, Xi Zhang, Shijian Lu and Chew Lim Tan
National University of Singapore, Singapore
- #188** **Deep Learning Based Language and Orientation Recognition in Document Analysis**
Li Chen, Song Wang, Wei Fan, Jun Sun and Satoshi Naoi
Fujitsu R&D Center, China
- #195** **BLSTM-based handwritten text recognition using Web resources**
Cristina Oprean, Laurence Likforman-Sulem, Chafic Mokbel and Adrian Popescu
Institut telecom/Telecom ParisTech, France

- #273** **Where to Apply Dropout in Recurrent Neural Networks for Handwriting Recognition?**
Théodore Bluche, Christopher Kermorvant and Jérôme Louradour
A2iA, France
- #332** **Writer Adaptive Feature Extraction Based on Convolutional Neural Networks for Online Handwritten Chinese Character Recognition**
Jun Du, Jian-Fang Zhai, Jin-Shui Hu, Bo Zhu, Si Wei and Lirong Dai
University of Science and Technology of China, China
- #372** **A hypothesize-and-verify framework for text recognition using Deep Recurrent Neural Network**
Anupama Ray, Sai Rajeswar and Santanu Chaudhury
Indian Institute of Technology Delhi, India
- #397** **Can RNNs Reliably Separate Script and Language at Word and Line Level?**
Ajeet Kumar Singh and Jawahar C V
IIIT Hyderabad, India

Oral Session 4: Word Spotting I / Text Detection

Time: Monday, August 24, 2015, 16:00 – 18:00

Location: Room 202

Chair: Apostolos Antonacopoulos (University Salford, United Kingdom)

- #283** **Improving OCR for an Under-Resourced Script Using Unsupervised Word-Spotting**
Adi Silberpfennig, Lior Wolf, Nachum Dershowitz, Seraogi Bhagesh and Bidyut B. Chaudhuri
Indian Statistical Institute, India
- #200** **Novel Line Verification for Multiple Instance Focused Retrieval in Document Collections**
Hongxing Gao¹, Marçal Rusiñol², Dimosthenis Karatzas², Josep Lladós², Rajiv Jain and David Doermann³
¹ *HikVision Co. Ltd., China*
² *Computer Vision Center, Spain*
³ *University of Maryland, USA*
- #234** **One-shot field spotting on colored forms using subgraph isomorphism**
Maroua Hammami¹, Pierre Héroux, Sébastien Adam and Vincent Poulain d'Andecy²
¹ *LITIS, France*
² *Yooz, France*
- #292** **Probabilistic Interpretation and Improvements to the HMM-Filler for Handwritten Keyword Spotting**
Joan Puigcerver, Alejandro Héctor Toselli and Enrique Vidal
Universitat Politècnica de València, Spain
- #100** **Using histogram representation and Earth Mover's Distance as an evaluation tool for text detection**
Stefania Calarasanu, Jonathan Fabrizio and Séverine Dubuisson
UPMC-LIP6, France
- #207** **Towards Query-by-Speech Handwritten Keyword Spotting**
Marçal Rusiñol, David Aldavert, Ricardo Toledo and Josep Lladós
Computer Vision Center, Spain

Oral Session 5: Printed/Handwritten: Convolutional Neural Network / Deep Learning

Time: Monday, August 24, 2015, 16:00 – 18:00

Location: Auditorium 300

Chair: Laurence Likforman-Sulem (Telecom ParisTech/TSI)

- #466 DeepDocClassifier: Deep Convolutional Neural Networks for Document Image Classification**
Muhammad Zeshan Afzal¹, Samuele Capobianco, Muhammad Imran Malik, Thomas Breuel, Andreas Dengel², Marcus Liwicki³ and Simone Marinai⁴
¹ *University of Technology Kaiserslautern, Germany*
² *DFKI - German Research Center for Artificial Intelligence, Germany*
³ *University of Fribourg, Switzerland*
⁴ *University of Florence, Italy*
- #404 Evaluation of Deep Convolutional Nets for Document Image Classification and Retrieval**
Adam Harley, Alex Ufkes and Konstantinos Derpanis
Ryerson University, Canada
- #106 Stretching Deep Architectures for Text Recognition**
Yuchen Zheng, Yajuan Cai, Guoqiang Zhong, Chherawala Youssouf, Yaxin Shi and Junyu Dong
Ocean University of China, China
- #333 High Performance Offline Handwritten Chinese Character Recognition Using GoogLeNet and Directional Feature Maps**
Zhuoyao Zhong, Lianwen Jin and Zecheng Xie
South China University of Technology, China
- #365 Deep BLSTM Neural Networks for Unconstrained Continuous Handwritten Text Recognition**
Volkmar Frinken and Seiichi Uchida
Kyushu University, Japan

Oral Session 6: Document Analysis I

Time: Monday, August 24, 2015, 16:00 – 18:00

Location: Room 204

Chair: Elisa H. Barney-Smith (Boise State University, USA)

- #447** **Table information extraction and structure recognition using query patterns**
Thotreingam Kasar, Tapan Kumar Bhowmik and Abdel Belaid
Université de Lorraine - LORIA, France
- #134** **Preselection of Support Vector Candidates by Relative Neighborhood Graph for Large-Scale Character Recognition**
Masanori Goto¹, Ryosuke Ishida and Seiichi Uchida²
¹ *GLORY LTD., Japan*
² *Kyushu University, Japan*
- #160** **Detecting Dense Foreground Stripes in Arabic Handwriting for Accurate Baseline Positioning**
Felix Stahlberg and Stephan Vogel
Qatar Computing Research Institute, Qatar
- #219** **Influence of Text Line Segmentation in Handwritten Text Recognition**
Verónica Romero, Joan Andreu Sánchez, Vicente Bosch, Katrien Depuydt and Jesse de Does
Universitat Politècnica de Valencia, Spain
- #348** **Date Field Extraction from Handwritten Documents Using HMMs**
Ranju Mandal, Partha Roy¹, Umapada Pal² and Michael Blumenstein
¹ *Indian Institute of Technology Roorkee, India*
² *Indian Statistical Institute, India*
- #147** **Robust Text Segmentation using Graph Cut**
Shangxuan Tian, Shijian Lu, Bolan Su and Chew Lim Tan
National University of Singapore, Singapore

Oral Session 7: Online Handwriting

Time: Tuesday, August 25, 2015, 08:20 – 09:40

Location: Room 202

Chair: Réjean Plamondon (Ecole Polytechnique de Montreal, Canada)

- #028 Online Handwritten Tibetan Syllable Recognition based on Component Segmentation Method**
Long-Long Ma and Jian Wu
Institute of Software, Chinese Academy of Sciences, China
- #190 Learning Non-Markovian Constraints for Handwriting Recognition**
Ryosuke Kakisako, Seiichi Uchida and Volkmar Frinken
Kyushu University, Japan
- #127 Improving Sigma-Lognormal Parameter Extraction**
Daniel Martín-Albo¹, Réjean Plamondon² and Enrique Vidal³
¹ *PRHLT Research Center, Spain*
² *École Polytechnique de Montréal, Canada*
³ *Universitat Politècnica de València, Spain*
- #224 Improved Deep Convolutional Neural Network For online Handwritten Chinese Character Recognition using Domain-Specific Knowledge**
Weixin Yang, Lianwen Jin, Zecheng Xie and Ziyong Feng
South China University of Technology, China

Oral Session 8: Word Spotting II

Time: Tuesday, August 25, 2015, 08:20 – 09:40

Location: Auditorium 300

Chair: Thierry Paquet (LITIS - University of Rouen, France)

- #169 Inkball Models for Character Localization and Out-of-Vocabulary Word Spotting**
Nicholas Howe
Smith College, USA
- #267 Segmentation-free Query-by-String Word Spotting with Bag-of-Features HMMs**
Leonard Rothacker and Gernot A. Fink
TU Dortmund University, Germany
- #311 Handwritten Word Spotting by Inexact Matching of Grapheme Graphs**
Pau Riba Fiérrez, Josep Lladós and Alicia Fornés
Computer Vision Center - Barcelona, Spain
- #402 Adapting Off-the-Shelf CNNs for Word Spotting & Recognition**
Arjun Sharma and Pramod Sankar Kompalli
Xerox Research Center India, India

Oral Session 9: Document Analysis II

Time: Tuesday, August 25, 2015, 08:20 – 09:40

Location: Room 204

Chair: Ergina Kavallieratou (University of the Aegean, Greece)

- #111** **A proposal of a document image reading-life log based on document image retrieval and eyetracking**
Olivier Augereau, Koichi Kise and Kensuke Hoshika
Osaka Prefecture University, Japan
- #193** **Paragraph text segmentation into lines with Recurrent Neural Networks**
Bastien Moysset, Christopher Kermorvant, Christian Wolf and Jérôme Louradour
A2iA, France
- #399** **Visual Appearance based Document Classification Methods: Performance Evaluation and Benchmarking**
Syed Saqib Bukhari and Andreas Dengel
DFKI - German Research Center for Artificial Intelligence, Germany
- #083** **Document Image Quality Assessment based on Improved Gradient Magnitude Similarity Deviation**
Alireza Alaei, Donatello Conte and Romain Raveaux
Université François-Rabelais de Tours, France

Plenary Talk 3

Time: Tuesday, August 25, 2015, 09:40 – 10:30

Location: Auditorium 300

Chair: Mohamed Cheriet (ETS, Montreal, Canada)

Entity-Centric Data Management

Philippe Cudre-Mauroux

University of Fribourg, Switzerland



Abstract. Until recently, structured (e.g., relational) and unstructured (e.g., textual) data were managed very differently: Structured data was queried declaratively using languages such as SQL, while unstructured data was searched using boolean queries over inverted indices. Today, we witness the rapid emergence of entity-centric techniques to bridge the gap between different types of content and manage both unstructured and structured data more effectively. I will start this talk by giving a few examples of entity-centric data management. I will then describe two recent systems that were built in my lab and revolve around entity-centric data management techniques: ZenCrowd, a socio-technical platform that automatically connects HTML documents to semi-structured entities, and TripleProv, a scalable, efficient, and provenance-enabled back-end to manage graphs of entities.

Biography. Philippe Cudre-Mauroux is a Swiss-NSF Professor and the director of the eXascale Infolab at the University of Fribourg in Switzerland. Previously, he was a postdoctoral associate working in the Database Systems group at MIT. He received his Ph.D. from the Swiss Federal Institute of Technology EPFL, where he won both the Doctorate Award and the EPFL Press Mention in 2007. Before joining the University of Fribourg, he worked on distributed information and media management for HP, IBM Watson Research (NY), and Microsoft Research Asia. He was Program Chair of the International Semantic Web Conference in 2012 and General Chair of the International Symposium on Data-Driven Process Discovery and Analysis in 2012 and 2013. He recently won the Verisign Internet Infrastructures Award, a Swiss National Center in Research award, as well as a Google Faculty Research Award. His research interests are in next-generation, Big Data management infrastructures for non-relational data. Webpage: <http://exascale.info/phil>

Oral Session 10: Graphics Analysis and Recognition

Time: Tuesday, August 25, 2015, 10:50 – 12:30

Location: Room 202

Chair: Bart Lamiroy (Univ. of. Lorraine-LORIA, France)

- #189 Exploring the World of Fonts for Discovering the Most Standard Fonts and the Missing Fonts**
Seiichi Uchida, Yuji Egashira and Kota Sato
Kyushu University, Japan
- #101 A Bottom-up Method Using Texture Features and a Graph-based Representation for Lettrine Recognition and Classification**
Maroua Mehri, Petra Gomez-Krämer, Pierre Héroux, Mickaël Coustaty, Julien Lerouge and Rémy Mullot
University of La Rochelle, France
- #181 A Fast Color Barcode Detection Method through Cross Identification on Mobile Platforms**
Yu Zhang and Tong Lu
Nanjing University, China
- #289 Attributed Graph Grammar for Floor Plan Analysis**
Lluís-Pere De Las Heras, Oriol Ramos Terrades and Josep Lladós
Computer Vision Center - Barcelona, Spain
- #302 Content-based Comic Retrieval Using Multilayer Graph Representation and Frequent Graph Mining**
Thanh Nam Le, Muhammad Muzzamil Luqman, Jean-Christophe Burie and Jean-Marc Ogier
University of La Rochelle, France

Oral Session 11: Printed/Handwritten: Recurrent Models

Time: Tuesday, August 25, 2015, 10:50 – 12:30

Location: Auditorium 300

Chair: Volker Märgner (Technische Universität Braunschweig, Germany)

- #197 Training an Arabic handwriting recognizer without a handwritten training data set**
Irfan Ahmad and Gernot Fink
TU Dortmund University, Germany
- #432 Unconstrained Bengali Handwriting Recognition with Recurrent Models**
Utpal Garain, Luc Mioulet, Bidyut Baran Chaudhuri¹, Clement Chatelain and Thierry Paquet²
¹*Indian Statistical Institute, India*
²*LITIS - Normandie University, France*
- #246 Hidden Markov model topology optimization for handwriting recognition**
Núria Cirera, Alicia Fornés and Josep Lladós
Computer Vision Center - Barcelona, Spain
- #331 ALTID: Arabic/Latin Text Images Database for recognition research**
Imen Chtourou, Ahmed Cheikh Rouhou, Faten Kallel and Slim Kanoun
ENIS, Tunisia
- #166 Content-Independent Font Recognition on a Single Chinese Character using Sparse Representation**
Weikang Song, Zhouhui Lian, Yingmin Tang and Jianguo Xiao
Institute of Computer Science and Technology, Peking University, China

Oral Session 12: Document Analysis III

Time: Tuesday, August 25, 2015, 10:50 – 12:30

Location: Room 204

Chair: Rolf Ingold (Univ. Fribourg, Switzerland)

- #409 Gradient-Domain Degradations for Improving Historical Documents Images Layout Analysis**
Mathias Seuret, Kai Chen, Nicole Eichenberger, Marcus Liwicki and Rolf Ingold
University of Fribourg, Switzerland
- #412 Page Segmentation of Historical Document Images with Convolutional Autoencoders**
Kai Chen, Mathias Seuret, Marcus Liwicki, Jean Hennebert and Rolf Ingold
University of Fribourg, Switzerland
- #235 DASyR(IR) - Document Analysis System for Systematic Reviews (for Information Retrieval)**
Florina Piroi, Aldo Lipani, Mihai Lupu and Allan Hanbury
Vienna University of Technology, Austria
- #387 Color Structure Recovering in Strong Specular Text Regions**
Tam Nguyen, GueeSang Lee, Huan Nguyen Nhu, Thuc Nguyen Dinh
HCMC University of Science, Vietnam
- #010 Automatic Extraction of Correlation-Entropy Features for Text Document Analysis Directly in Run-Length Compressed Domain**
Mohammed Javed¹, P Nagabhushan and Bidyut Baran Chaudhuri²
¹ *University of Mysore, India*
² *Indian Statistical Institute, India*

Plenary Talk 4

Time: Tuesday, August 26, 2015, 13:50 – 14:40

Location: Auditorium 300

Chair: Abdel Belaïd (Univ. of Lorraine-LORIA, France)

Document Analysis Meets Activity Recognition: A New Paradigm of Analyzing Documents in Combination With Users' Reading Behavior

Koichi Kise

Osaka Prefecture University, Japan



Abstract. As a new paradigm of research in the field of document analysis, I propose a notion of mutual analysis of documents and activities. Documents have been the single entity to be analyzed in the field. However their values cannot be fully estimated by just looking at their contents. People obtain information from documents by the activities of reading. The key to analyze documents for their values is in this point. The analysis of human reading activities gives us a way to obtain additional information on the contents of documents such as interesting and difficult. On the other hand, by augmenting the reading activities by the contents, we are able to know more about actors of these activities such as personal preferences.

In my talk I show some work on this topic including estimating the number of words read (wordometer), the type of documents and the level of understanding, as well as document annotations by reading behavior. I would also like to show some important open problems to be shared with the audience for discussion.

Biography. Koichi Kise received his B.E., M.E. and Ph.D. degrees in communication engineering from Osaka University, Osaka, Japan in 1986, 1988 and 1991, respectively.

From 2000 to 2001, he was a visiting professor at German Research Center for Artificial Intelligence (DFKI), Germany. He is now a Professor of the Department of Computer Science and Intelligent Systems, Osaka Prefecture University, Japan.

He received awards including the best paper award of IEICE in 2008, the IAPR/ICDAR best paper awards in 2007 and 2013, the IAPR Nakano award in 2010, the ICFHR best paper award in 2010 and the ACPR best paper award in 2011. He is now working as the chair of the IAPR technical committee 11 (reading systems) and a member of the IAPR conferences and meetings committee. His major research activities are in analysis, recognition and retrieval of documents, images and activities.

Poster Session 2

Time: Tuesday, August 25, 2015, 14:40 – 15:40

Location: Foyer 300

Chair: Bertrand Couasnon (Irisa / Insa, France)

-- Handwriting Analysis and Recognition

#025 Class-Adaptive Zoning Methods for Recognizing Handwritten Digits and Characters

Donato Impedovo and Giuseppe Pirlo

Dipartimento di Informatica, Università di Bari, Italy, Italy

#039 Cost-sensitive MQDF Classifier for Handwritten Chinese Address Recognition

Shujing Lu¹, Xiaohua Wei and Yue Lu²

¹ Shanghai Research Institute of China Post Group, China

² East China Normal University, China

#047 Similarity-based Regularization for Semi-Supervised Learning for Handwritten Digit Classification

Donato Barbuzzi, Giuseppe Pirlo¹, Seiichi Uchida², Volkmar Frinken and Donato Impedovo

¹ *Dipartimento di Informatica, Università di Bari, Italy, Italy*

² *Kyushu University, Japan*

#064 An Open Source Testing Tool for Evaluating Handwriting Input Methods

Liquan Qiu, Lianwen Jin, Ruifen Dai, Yuxiang Zhang and Lei Li

South China University of Technology, China

#323 Tackling Pattern Recognition by Vector Space Embedding

Brian Iwana, Seiichi Uchida, Kaspar Riesen and Volkmar Frinken

Kyushu University, Japan

#360 Arabic Ligatures: Analysis and Application in Text Recognition

Yousef Elarian¹, Irfan Ahmad², Sameh Awaida, Wasfi Al-Khatib and Abdelmalek Zidouri

¹ *Jazan University, Saudi Arabia*

² TU Dortmund, Germany

#385 Crossing the lines: making optimal use of context in line-based Handwritten Text Recognition

Jafar Tanha, Jesse de Does¹, Katrien Depuydt and Joan Andreu Sánchez²

¹ INL, Netherlands

² *Universitat Politecnica de Valencia, Spain*

#414 CNN Based Common Approach to Handwritten Character Recognition of Multiple Scripts

Durjoy Sen Maitra, Ujjwal Bhattacharya and Swapan Kr. Parui

Indian Statistical Institute, India

#431 Trajectory Recovery and Stroke Reconstruction of Mathematical Symbols

Behrang Sabeghi Saroui and Volker Sorge

University of Birmingham, United Kingdom

#437 Evaluation of Techniques for Signature Classification from Accelerometer and Gyroscope data

Lukas Tencer, Marta Režnáková and Mohamed Cheriet

Univeristy of Quebec's ETS, Canada

- #468 Age, Gender and Handedness Prediction from Handwriting using Gradient Features**
Nesrine Bouadjenek, Hassiba Nemmour and Youcef Chibani
USTHB, Algeria

-- Off-line/on-line Handwriting

- #148 Isolated Character Recognition using Projections of Oriented Gradients**
George Retsinas, Basilis Gatos, Nikolaos Stamatopoulos and Georgios Louloudis
National Center for Scientific Research "Demokritos", Greece
- #178 Study of Two Zone-based Features for Online Bengali and Devanagari Character Recognition**
Rajib Ghosh¹ and Partha Pratim Roy²
¹*National Institute of Technology Patna, India*
²*Indian Institute of Technology Roorkee, India*
- #243 A Complete Automatic Short Answer Assessment System with Student Identification**
Hemmaphan Suwanwiwat¹, Umapada Pal² and Michael Blumenstein
¹*Griffith University, Australia*
²*Indian Statistical Institute, India*
- #277 Writer Adaptation of Online Handwriting Recognition using Adaptive RBF Network**
Surabhi Raje, Kapil Mehrotra and Swapnil Belhe
CDAC, India
- #349 Joint Denoising and Magnification of Noisy Low-Resolution Textual Images**
Rim Walha, Fadoua Drira, Franck Lebourgeois, Adel M. Alimi and Christophe Garcia
INSAVALOR LIRIS de Lyon, France
- #435 Online Handwriting Recognition using Depth Sensors**
Rajat Aggarwal, Sirnam Swetha, Anoop M. Namboodiri, Jayanthi Sivaswamy and C. V. Jawahar
IIT Hyderabad, India

-- Historical Document Processing

- #056 A Structural Signature Based on Texture for Digitized Historical Book Page Categorization**
Maroua Mehri, Pierre Héroux, Julien Lerouge, Petra Gomez-Krämer and Rémy Mullot
University of La Rochelle, France
- #062 Seamless Stitching with Shape Deformation for Historical Document Images**
Wei Liu, Wei Fan, Li Chen, Jun Sun and Naoi Satoshi
Fujitsu R&D Center, China
- #119 Aligning transcript of historical documents using energy minimization**
Rafi Cohen, Irina Rabaev, Itshak Dinstein, Jihad El-Sana and Klara Kedem
Ben-Gurion University of the Negev, Israel

- #155 A segmentation free Word Spotting for handwritten documents**
Nicole Vincent¹, Adam Ghorbel¹ and Jean-Marc Ogier²
¹ *Paris Descartes University, France*
² *University of La Rochelle, France*
- #157 Graph matching versus bag of graph for lettrines recognition**
Mickaël Coustaty and Jean-Marc Ogier
University of La Rochelle, France
- #284 Viral Transcript Alignment**
Gil Sadeh, Lior Wolf, Tal Hassner, Daniel Stoekl and Nachum Dershowitz
EPHE-Sorbonne, France
- #396 Noise Characterization in Ancient Document Images Based on DCT Coefficient Distribution**
Fitri Arnia, Fardian Fardian, Sayed Muchallil and Khairul Munadi
Syiah Kuala University, Indonesia
- #413 Word of Blobs**
Jihad El-Sana and Klara Kedem
Ben-Gurion University of the Negev, Israel
- Language Modeling**
- #023 Combination of Multiple Aligned Recognition Outputs using WFST and LSTM**
Mayce Al Azawi¹, Marcus Liwicki² and Thomas M Breuel
¹ *ZTT, Germany*
² *University of Fribourg, Switzerland*
- #072 Using Multiple Sequence Alignment and Statistical Language Model to Integrate Multiple Chinese Address Recognition Outputs**
Shengchang Chen, Shujing Lu¹, Ying Wen and Yue Lu²
¹ *Shanghai Research Institute of China Post Group, China*
² *East China Normal University, China*
- #113 The Eye as the Window of the Language Ability: Estimation of English Skills by Analyzing Eye Movement While Reading Documents**
Kazuho Yoshimura, Kai Kunze and Koichi Kise
Osaka Prefecture University, Japan
- #330 Optical Modelling and Language Modelling Trade-off for Handwritten Text Recognition**
Mauricio Villegas, Joan Andreu Sanchez and Enrique Vidal
Universitat Politècnica de València, Spain
- #424 Planar Markovian Approach for the Recognition of a Wide Vocabulary of Arabic Decomposable Words**
Imen Ben Cheikh and Imen Allagui
LaTICE, Tunisia

-- Long Short-Term Memory Networks

- #092 Benchmarking discriminative approaches for word spotting in handwritten documents**
 Gautier Bideault, Luc Mioulet, Clément Chatelain and Thierry Paquet
LITIS - Normandie University, France
- #180 A Context-Sensitive-Chunk BPTT Approach to Training Deep LSTM/BLSTM Recurrent Neural Networks for Offline Handwriting Recognition**
 Kai Chen, Zhi-Jie Yan and Qiang Huo
Microsoft Research Asia, China
- #194 A Study on Effects of Implicit and Explicit Language Model Information for DBLSTM-CTC Based Handwriting Recognition**
 Qi Liu, Lijuan Wang and Qiang Huo
Microsoft Research Asia, China
- #407 Curriculum Learning for Printed Text Line Recognition of Ligature-based Scripts**
Adnan Ul-Hasan¹, Faisal Shafait² and Marcus Liwicki³
¹ *University of Kaiserslautern, Germany*
² *University of Western Australia, Australia*
³ *University of Fribourg, Switzerland*
- #422 Deep Learning and Recurrent Connectionist-based Approaches for Arabic Text Recognition in Videos**
Sonia Yousfi, Sid-Ahmed Berrani and Christophe Garcia
Orange Labs, France
- #428 A Sequence Learning Approach for Multiple Scripts Identification**
Adnan Ul-Hasan¹, Muhammad Zeshan Afzal¹, Faisal Shafait², Marcus Liwicki³ and Thomas Breuel
¹ *University of Kaiserslautern, Germany*
² *University of Western Australia, Australia*
³ *University of Fribourg, Switzerland*
- #455 Scale and Rotation Invariant OCR for Pashto Cursive Script using MDLSTM Network**
 Riaz Ahmad, Muhammad Zeshan Afzal¹, Sheikh Faisal Rashid, Marcus Liwicki² and Thomas Breuel
¹ *University of Technology Kaiserslautern, Germany*
² *University of Fribourg, Switzerland*
- #473 Binarization-free OCR for Historical Documents Using LSTM Networks**
Mohammad Reza Yousefi, Mohammad Reza Soheili, Thomas M. Breuel, Ehsanollah Kabir and Didier Stricker
German Research Center for Artificial Intelligence, Germany

-- Graphics Analysis and Recognition

- #096 Topological Simplification of Electrical Circuits by Super-component Analysis**
 Paramita De, Sekhar Mandal, Partha Bhowmick and Bhabatosh Chanda
Indian Institute of Engineering Science and Technology, Shibpur, India

- #211 Representation and Reconstruction of Map Regions**
Samit Biwas, Sekhar Mandal and Amit Kumar Das
Indian Institute of Engineering Science and Technology, Shibpur, India
- #268 Automated Scoring of Bender Gestalt Test Using Image Analysis Techniques**
Momina Moetesum, Imran Siddiqi, Uzma Masroor and Chawki Djeddi
Larbi Tebessi University, Algeria
- #315 Overlapped-Triangle Analysis with Hierarchical Ranking of Dominance**
Xiaoqing Lu, Lu Liu, Zhi Tang, Haibin Ling and Jingwei Qu
Peking University, China
- #316 Automated Analysis of Line Plots in Documents**
Rathin Radhakrishnan Nair, Nishant Sankaran, Ifeoma Nwogu and Venu Govindaraju
SUNY Buffalo, USA
- #319 Chart Classification by Combining Deep Convolutional Networks and Deep Belief Networks**
Liu Xiao, Tang Binbin, Wang Zhenyang, Xu Xianghua, Pu Shiliang, Tao Dapeng and Song Mingli
ZheJiang University, China
- #486 Visual Graph Analysis for Quality Assessment of Manually Labelled Documents Image Database**
Romain Giot, Romain Bourqui, Nicholas Journet and Anne Vialard
LaBRI - Univ. Bordeaux, France

Oral Session 13: Printed/Handwritten: Script-Vocabulary Recognition

Time: Tuesday, August 25, 2015, 16:00 – 18:00

Location: Room 202

Chair: Umapada Pal (ISI, Kolkata, India)

- #392 A Sigma-Lognormal Model for Character Level handwritten CAPTCHA Generation**
Chetan Ramaiah, Réjean Plamondon¹ and Venu Govindaraju²
¹ *École Polytechnique de Montréal, Canada*
² *SUNY Buffalo, USA*
- #014 Co-occurrence Matrix of Oriented Gradients for Word Script and Nature Identification**
Asma Saidani, Afef Kacem¹ and Abdel Belaid²
¹ *ENSIT Université de Tunis, Tunisia*
² *Université de Lorraine - LORIA, France*
- #374 A Segmentation-Free Approach for Printed Devanagari Script Recognition**
Tushar Karayil, Adnan Ul-Hasan and Thomas Breuel
University of Kaiserslautern, Germany
- #254 A Comparative Study of Features for Handwritten Bangla Text Recognition**
Ayan Kumar Bhunia, Ayan Das, Partha Pratim Roy¹ and Umapada Pal²
¹ *Indian Institute of Technology Roorkee, India*
² *Indian Statistical Institute, India*
- #078 Evaluation of Neural Network Language Models in Handwritten Chinese Text Recognition**
Yi-Chao Wu, Fei Yin and Cheng-Lin Liu
Institute of Automation of Chinese Academy of Sciences, China
- #480 Word-level Script Identification for Handwritten Indic scripts**
Pawan Kumar Singh, Ram Sarkar, Mita Nasipuri and David Doermann
University of Maryland, USA

Oral Session 14: Printed/Handwritten: Applications

Time: Tuesday, August 25, 2015, 16:00 – 18:00

Location: Auditorium 300

Chair: Venu Govindaraju (University at Buffalo, USA)

#013 Solving Substitution Ciphers for OCR with a Semi-supervised Hidden Markov Model

Erik Scharwächter¹ and Stephan Vogel²

¹ *Qatar Computing Research Institute, Germany*

² *Qatar Computing Research Institute, Qatar*

#179 Building Handwriting Recognizers by Leveraging Skeletons of Both Offline and Online Samples

Xiong Zhang, Min Wang, Lijuan Wang, Qiang Huo and Haifeng Li

Microsoft Research Asia, China

#080 Segmentation-free Handwritten Chinese Text Recognition with LSTM-RNN

Ronaldo Messina and Jérôme Louradour

A2iA, France

#118 Investigation of Segmental Conditional Random Fields for Large Vocabulary Handwriting Recognition

Mahdi Hamdani, Mahaboob Ali Basha Shaik, Patrick Doetsch and Hermann Ney

RWTH Aachen University, Germany

#041 Framewise and CTC Training of Neural Networks for Handwriting Recognition

Théodore Bluche¹, Hermann Ney², Jérôme Louradour¹ and Christopher Kermorvant

¹ *A2iA, France*

² *RWTH Aachen University, Germany*

#042 The LIMSI Handwriting Recognition System for the HTRtS 2014 Contest

Théodore Bluche¹, Hermann Ney² and Christopher Kermorvant

¹ *A2iA, France*

² *RWTH Aachen University, Germany*

Oral Session 15: Document Understanding

Time: Tuesday, August 25, 2015, 16:00 – 18:00

Location: Room 204

Chair: Koichi Kise (Osaka Prefecture University)

- #034 Multi-Strategy Tracking Based Text Detection in Scene Videos**
Ze-Yu Zuo, Shu Tian, Wei-Yi Pei and Xu-Cheng Yin
University of Science and Technology Beijing, China
- #353 Automatic Discrimination of Text and Non-Text Natural Images**
Chengquan Zhang, Cong Yao, Baoguang Shi and Xiang Bai
Huazhong University of Science and Technology, China
- #128 Efficient Text Localization in Born-Digital Images by Local Contrast-Based Segmentation**
Kai Chen, Fei Yin, Amir Hussain and Cheng-Lin Liu
Chinese Academy of Sciences, China
- #217 Automatic Script Identification in the Wild**
Baoguang Shi, Cong Yao, Chengquan Zhang, Xiaowei Guo, Feiyue Huang and Xiang Bai
Huazhong University of Science and Technology, China
- #295 Efficient Scene Text Localization and Recognition with Local Character Refinement**
Lukáš Neumann and Jiří Matas
Czech Technical University in Prague, FEE, Czech Republic
- #366 Robust Seed-Based Stroke Width Transform for Text Detection in Natural Images**
Feng Su and Hailiang Xu
Nanjing University, China

Poster Session 3

Time: Wednesday, August 26, 2015, 08:30 – 09:30

Location: Salon 200

Chair: Afef Kacem (University of Tunis, LaTICE, Tunis, Tunisia)

-- Text Analysis and Extraction

- #051 Text Detection in Nature Scene Images Using Two-stage Nontext Filtering**
Qingqing Wang, Yue Lu and Shiliang Sun
East China Normal University, China
- #089 Text Line Extraction in Document Images**
Liuan Wang, Hiroshi Tanaka, Wei Fan, Jun Sun and Satshi Naoi
Fujitsu R&D Center, China
- #203 Generation of synthetic training data for handwritten Indic script recognition**
Shivansh Gaur, Siddhant Sonkar and Partha Roy
Indian Institute of Technology Roorkee, India
- #231 Text-Graphics Separation to Detect Logo and Stamp from Color Document Images: A Spectral Approach**
Amit Nandedkar, Jayanta Mukhopadhyay and Shamik Sural
Indian Institute of Technology, India
- #259 GRPOLY-DB: An Old Greek Polytonic Document Image Database**
Basilis Gatos¹, Nikolaos Stamatopoulos, Georgios Louloudis, Giorgos Sfikas, George Retsinas, Fotini Simistira, Vassilis Papavassiliou and Vassilis Katsourous²
¹ *National Center for Scientific Research "Demokritos", Greece*
² *Athena Research and Innovation Center, Greece*
- #308 Text Zone Classification using Unsupervised Feature Learning**
Nibal Nayef and Jean-Marc Ogier
University of La Rochelle, France
- #324 MRF Based Text Binarization in Complex Images using Stroke Feature**
Yanna Wang, Cunzhao Shi, Baihua Xiao and Chunheng Wang
Institute of Automation, Chinese Academy of Sciences, China
- #452 Text and Non-text Segmentation using Connected Component-based Features**
Viet Phuong Le, Nibal Nayef, Muriel Visani, Jean-Marc Ogier and Cao De Tran
University of La Rochelle, France

-- OCR

- #037 Recognition of Urdu Ligatures - A Holistic Approach**
Israr Uddin Khattak, Imran Siddiqi, Shehzad Khalid and Chawki Djeddi
Larbi Tebessi University, Algeria
- #299 Label Transition and Selection Pruning and Automatic Decoding Parameter Optimization for Time-Synchronous Viterbi Decoding**
Yasuhisa Fujii, Dmitriy Genzel, Ashok C. Popat and Remco Teunen
Google, USA
- #306 Document Image OCR Accuracy Prediction via Latent Dirichlet Allocation**
Xujun Peng, Huaigu Cao and Prem Natarajan
Raytheon BBN Technologies, USA

-- Document Retrieval

- #123 Extracting Structured Data from Unstructured Document with Incomplete Resources**
Hervé Déjean
XRCE, France
- #130 Semantic Label and Structure Model based approach for Entity Recognition in Database Context**
Nihel Kooli and Abdel Belaïd
Université de Lorraine - LORIA, France
- #144 Character Retrieval of Vectorized Cuneiform Script**
Bartosz Bogacz, Michael Gertz and Hubert Mara
Heidelberg University, Germany
- #350 Efficient Word Image Retrieval using Fast DTW Distance**
Nagendar G and C.V Jawahar
IIIT Hyderabad, India
- #367 Interactive Content-Based Document Retrieval Using Fuzzy Attributed Relational Graph Matching**
Ramzi Chaieb, Karim Kalti and Najoua Essoukri Ben Amara
SAGE Research Unit, Tunisia (will be presented by Oussama Zayene)

-- Scene - Video - Color Image Analysis

- #095 Object Proposals for Text Extraction in the Wild**
Lluis Gomez and Dimosthenis Karatzas
Computer Vision Center - Barcelona, Spain
- #105 Machine-Readable Region Identification from Partially Blurred Document Images**
Qinwen Wang, Yixue Wang, Chenyang Wang, Jufeng Yang, Tao Li and Kai Wang
College of Computer and Control Engineering, Nankai University, China
- #165 Efficient Estimation of Character Normal Direction for camera-based OCR**
Kanta Kuramoto¹, Wataru Ohyama², Tetsushi Wakabayashi and Fumitaka Kimura
¹ *Yahoo, Japan*
² *Mie University, Japan*
- #172 A New Method based on Bag of Filters for Character Recognition in Scene Images by Learning**
Qisu Li¹, Tong Lu¹, Palaiahnakote Shivakumara², Umapada Pal³ and Chew Lim Tan⁴
¹ *Nanjing University, China*
² *University of Malaya, Malaysia*
³ *Indian Statistical Institute, India*
⁴ *National University of Singapore, Singapore*
- #177 Scene Character Recognition using Markov Random Field**
Xiaolong Liu and Tong Lu
Nanjing University, China
- #209 True Color Distributions of Scene Text and Background**
Renwu Gao, Shoma Eguchi and Seiichi Uchida
Kyushu University, Japan

- #212** **Fisher Vector Encoding of Micro Color Features for (Real World) Jigsaw Puzzles**
Fabian Richter, Christian Eggert and Rainer Lienhart
University of Augsburg, Germany
- #215** **Recognizing Perspective Scene Text with Context Feature**
Anna Zhu, Yangbo Dong and Guoyou Wang
Huazhong University of Science & Technology, China
- #229** **Multiresolution Approach Based on Adaptive Superpixels for Administrative Documents Segmentation into Color Layers**
Elodie Carel¹, Jean-Christophe Burie¹, Vincent Courboulay, Jean-Marc Ogier¹ and Vincent Poulain d'Andecy²
¹ *University of La Rochelle, France*
² *Yooz, France*
- #237** **A Comparative Study of Local Detectors and Descriptors for Mobile Document Classification**
Marçal Rusiñol¹, Joseph Chazalon², Jean-Marc Ogier² and Josep Lladós¹
¹ *Computer Vision Center, Spain*
² *University of La Rochelle, France*
- #238** **SRIF: Scale and Rotation Invariant Features for Camera-Based Document Image Retrieval**
Quoc Bao Dang, Muhammad Muzzamil Luqman, Mickaël Coustaty, Cao De Tran and Jean-Marc Ogier
University of La Rochelle, France
- #288** **Use Case Visual Bag-of-Words Techniques for Camera Based Identity Document Classification**
Lluís-Pere De Las Heras¹, Oriol Ramos Terrades¹, Josep Lladós¹, David Fernández and Cristina Cañero²
¹ *Computer Vision Center, Spain*
² *ICAR, Spain*
- #321** **A Character Degradation Model for Color Document Images**
Do Thi Luyen, Elodie Carel, Jean-Marc Ogier and Jean-Christophe Burie
University of La Rochelle, France
- #336** **Comic Frame Extraction via Line Segments Combination**
Yongtao Wang, Yafeng Zhou and Zhi Tang
Peking University, China
- #343** **Mixed handwritten and printed digit recognition in Sudoku with Convolutional Deep Belief Network**
Baptiste Wicht and Jean Hennebert
University of applied science of western switzerland, Switzerland
- #406** **A Dataset for Arabic Text detection, tracking and recognition in news Videos—AcTiV**
Oussama Zayene, Jean Hennebert, Sameh Masmoudi Touj, Rolf Ingold and Najoua Essoukri Benamara
SAGE Research Unit, Tunisia

- #426 Arabic Characters Recognition in Natural Scenes using Sparse Coding for Feature Representations**
Maroua Tounsi, Ikram Moalla, Adel M. Alimi and Franck Lebourgeois
INSAVALOR LIRIS de Lyon, France

-- Word Recognition - Spotting

- #026 Keyword spotting in handwritten documents based on a generic text line HMM and a SVM verification**
Yousri Kessentini¹ and Thierry Paquet²
¹ *MIRACL, Tunisia*
² *LITIS - Normandie University, France*
- #057 A Multiple Instances Approach to Improving Keyword Spotting on Historical Mongolian Document Images**
Hongxi Wei, Guanglai Gao and Xiangdong Su
Inner Mongolia University, China
- #074 HoG based Two-Directional Dynamic Time Wrapping for Handwritten Word Spotting**
Shunyi Yao, Ying Wen and Yue Lu
East China Normal University, China
- #098 A Direct Approach for Word and Character Segmentation in Run-Length Compressed Documents with an Application to Word Spotting**
Mohammed Javed¹, P Nagabhushan and Bidyut Baran Chaudhuri²
¹ *University of Mysore, India*
² *Indian Statistical Institute, India*
- #228 Shape-based Word Spotting in Handwritten Document Images**
Angelos P. Giotis, Giorgos Sfikas, Christophoros Nikou and Basilis Gatos
National Center for Scientific Research Demokritos, Greece
- #240 Segmentation-Free Pattern Spotting in Historical Document Images**
Sovann En, Caroline Petitjean, Stephane Nicolas and Laurent Heutte
LITIS, France
- #244 Unsupervised word spotting using a graph representation based on invariants**
Quang Anh Bui, Muriel Visani and Rémy Mullot
University of La Rochelle, France
- #261 Learning Local Image Descriptors for Word Spotting**
Sebastian Sudholt, Leonard Rothacker and Gernot Fink
TU Dortmund University, Germany
- #275 Using Attributes for Word Spotting and Recognition in Polytonic Greek Documents**
Giorgos Sfikas, Angelos P. Giotis, Georgios Louloudis and Basilis Gatos
National Center for Scientific Research "Demokritos", Greece
- #293 Context-Aware Lattice based Filler approach for Key Word Spotting in Handwritten Documents**
Alejandro Héctor Toselli, Joan Puigcerver and Enrique Vidal
Universitat Politècnica de València, Spain

- #294 High Performance Query-by-Example Keyword Spotting Using Query-by-String Techniques**
Enrique Vidal, Alejandro Héctor Toselli and Joan Puigcerver
Universitat Politècnica de València, Spain
- #351 Query by string word spotting based on character bi-gram indexing**
Suman Ghosh and Ernest Valveny
Computer Vision Center - Barcelona, Spain
- #369 A New Wavelet-Laplacian Method for Arbitrarily-Oriented Character Segmentation in Video Text Lines**
Guozhu Liang, Palaiahnakote Shivakumara¹, Tong Lu² and Chew Lim Tan³
¹ *University of Malaya, Malaysia*
² *Nanjing University, China*
³ *National University of Singapore, Singapore*
- #487 Performance Evaluation of DTW and its Variants for Word Spotting in Degraded Documents**
Tanmoy Mondal¹, Nicolas Ragot, Jean-Yves Ramel¹ and Umapada Pal²
¹ *Université de François Rabelais de Tours, France*
² *Indian Statistical Institute, India*
- #488 Exemplary Sequence Cardinality: An Effective Application for Word Spotting**
Tanmoy Mondal¹, Nicolas Ragot, Jean-Yves Ramel¹ and Umapada Pal²
¹ *Université de François Rabelais de Tours, France*
² *Indian Statistical Institute, India*

Oral Session 16: Syntactic/Semantic Analysis

Time: Wednesday, August 26, 2015, 09:50 – 11:10

Location: Room 201

Chair: Marcus Liwicki (German Research Center for Artificial Intelligence, Germany)

- #272 Language Identification from Handwritten Documents**
Luc Mioulet, Utpal Garain¹, Clément Chatelain, Thierry Paquet² and Philippine Barlas
¹ *Indian Statistical Institute, India*
² *LITIS - Normandie University, France*
- #088 A Syntax Directed System for the Recognition of Printed Arabic Mathematical Formulas**
Kawther Khazri, Afef Kacem¹ and Abdel Belaid²
¹ *ENSIT Université de Tunis, Tunisia*
² *Université de Lorraine - LORIA, France*
- #427 Unsupervised Feature Learning for Optical Character Recognition**
Devendra Sahu and Jawahar C. V.
IIIT Hyderabad, India
- #361 A clump splitting based method to localize speech balloons in comics**
Xicheng Liu, Yongtao Wang and Zhi Tang
Peking University, China

Oral Session 17: Printed/Handwritten: Visual Scene Analysis

Time: Wednesday, August 26, 2015, 11:10 – 12:30

Location: Room 201

Chair: Nicole Vincent (University Paris Descarte, France)

- #185 Scene Text Detection with Robust Character Candidate Extraction Method**
Myung-Chul Sung, Bongjin Jun, Hojin Cho and Daijin Kim
StradVision, Inc., South Korea
- #256 Towards Visual Words to Words**
Rakesh Mehta, Ondrej Chum and Jiri Matas
Czech Technical University in Prague, FEE, Czech Republic
- #383 Multi-Lingual Text Recognition from Video Frames**
Nabin Sharma, Ranju Mandal, Rabi Sharma, Partha Partim Roy¹, Umapada Pal² and Michael Blumenstein
¹ *Indian Institute of Technology Roorkee, India*
² *Indian Statistical Institute, India*
- #184 Lexicon-Driven Recognition of One-Stroke Character Strings in Visual Gesture**
Fei Yin, Pai-Pai Liu, Linlin Huang and Cheng-Lin Liu
Institute of Automation of Chinese Academy of Sciences, China

Oral Session - Competitions

Time: Wednesday, August 26, 2015, 14:30 – 16:30

Location: Room 201

Chairs: Apostolos Antonacopoulos (Univ. Salford, United Kingdom), Umapada Pal (Indian Statistical Institute, India)

-- Document Analysis Systems

#C01 Recognition of Documents with Complex Layouts (RDCL-2015)

Apostolos Antonacopoulos, Christian Clausner, Christos Papadopoulos and Stefan Pletschacher

PRImA - University of Salford, United Kingdom

-- Text in Challenging Contexts

#C02 Robust Reading (RR-2015)

Dimosthenis Karatzas¹, Lluís Gómez-Bigorda, Angelos Nicolaou, Suman Ghosh, Andrew Bagdanov, Masakazu Iwamura, Jiri Matas, Lukas Neumann, Vijay Ramaseshan Chandrasekhar, Shijian Lu, Faisal Shafait², Seiichi Uchida³ and Ernest Valveny

¹ *Computer Vision Center - Barcelona, Spain*

² *University of Western Australia, Australia*

³ *Kyushu University, Japan*

#C03 Smartphone Document Capture and OCR (SmartDoc-2015)

Jean-Christophe Burie, Joseph Chazalon, Mickaël Coustaty, Sébastien Eskenazi, Muhammad Muzzamil Luqman, Maroua Mehri, Nibal Nayef, Jean-Marc Ogier, Sophea Prum and Marçal Rusinol

University of La Rochelle, France

-- Historical Documents

#C04 Handwritten Text Recognition on the tranScriptorium Dataset (HTRtS-2015)

Joan Andreu Sánchez, Alejandro H. Toselli, Verónica Romero and Enrique Vidal

Universitat Politècnica de València, Spain

#C05 Text Line Detection in Historical Documents (ANDAR-TL-2015)

Michael Murdock

Ancestry.com, USA

#C06 Keyword Spotting for Handwritten Documents (KWS-2015)

Joan Puigcerver, Alejandro Héctor Toselli and Enrique Vidal

Universitat Politècnica de València, Spain

#C07 MultiSpectral Text Extraction Contest (MS-TEx-2015)

Rachid Hedjam, Hossein Ziaei Nafchi, Reza Farrahi Moghaddam, Margaret Kalacska and Mohamed Cheriet

University of Quebec, Canada

-- Identification

#C08 Signature Verification and Writer Identification for On- and Off-line Skilled Forgeries (SigWlcomp2015)

Muhammad Imran Malik

#C09 Multi-Script Writer Identification and Gender Classification (MS-WIGC-2015)

Chawki Djeddi, Somaya Al-Maadeed, Abdeljalil Gattal, Imran Siddiqi, Labiba Souici-Meslati and Haikal El Abed

Larbi Tebessi University, Algeria

-- Specific Challenges

#C10 Video Script Identification (CVSI-2015)

Nabin Sharma, Ranju Mandal, Rabi Sharma, Umapada Pal and Michael Blumenstein
Indian Statistical Institute, India

#C11 Text Image Super-Resolution (SR-2015)

Clément Peyrard, Moez Baccouche, Franck Mamalet and Christophe Garcia
Orange Labs, France

Organized by



Endorsed by



GOLD Sponsors



Silver Sponsors



Technically co-Sponsored by

