13th IAPR International Workshop on Document Analysis Systems
Welcome

It is both an honour and a pleasure to hold the Thirteenth IAPR International Workshop on Document Analysis Systems (DAS 2018), at the TU Wien, Austria, organized by the Computer Vision Lab (CVL). This workshop continues a tradition of bringing together researchers, academics and professionals from all over the world in the research field of Document Analysis Systems, as it was in all past DAS workshops, from Kaiserslautern, Germany (1994); Malvern, PA, USA (1996); Nagano, Japan (1998); Rio de Janeiro, Brazil (2000); Princeton, NJ, USA (2002); Florence, Italy (2004); Nelson, New Zealand (2006); Nara, Japan (2008); Boston, MA, USA (2010); Gold Coast, Australia (2012); Tours - Loire Valley, France (2014); to Santorini, Greece (2016). The DAS2018 particularly encourages the interaction of research students and developing academics with the more established academic community in an informal setting to present and to discuss new and current work. Their contributions help to make the workshop series as outstanding as it has been.

As with previous DAS workshops, DAS 2018 is a rigorously peer-reviewed and 100% participation single-track workshop focusing on system-level issues and approaches in document analysis and recognition. Of the 131 submissions received in an open call for papers, 77 were accepted for presentation at the workshop (58.8%). Of these, 32 papers were designated for oral presentation (24.4%) and 45 for poster presentation (34.4%). In the final program, authors from 32 different countries are represented. The final program consists of 9 oral sessions, two poster sessions and the discussion group sessions. We offer our deepest thanks to all who contributed their time and effort to make DAS 2018 a first-rate event for the community.

We hope that this program will further stimulate research and provides practitioners with better techniques, algorithms, and tools for the deployment. We feel honoured and privileged to serve the best recent developments in the field of Document Analysis Systems to you through this exciting program.

Robert Sablatnig
General Chair

Florian Kleber
General Chair
# Overview

<table>
<thead>
<tr>
<th>Tuesday, April 24</th>
<th>Kuppelsaal, Sem202</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 Registration</td>
<td></td>
</tr>
<tr>
<td>09:30 Tutorial 1: René Donner</td>
<td></td>
</tr>
<tr>
<td>10:30 Coffee Break</td>
<td></td>
</tr>
<tr>
<td>11:00 Tutorial 2: Alejandro Toselli (Kuppelsaal)</td>
<td></td>
</tr>
<tr>
<td>11:00 Tutorial 3: Marcel Würsch (Sem 202)</td>
<td></td>
</tr>
<tr>
<td><strong>13:30 Lunch Break</strong></td>
<td></td>
</tr>
<tr>
<td>14:30 Tutorial 4: Thomas Breuel</td>
<td></td>
</tr>
<tr>
<td>19:00 Welcome Reception, TUtheSky</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wednesday, April 25</th>
<th>Kuppelsaal</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00 Registration</td>
<td></td>
</tr>
<tr>
<td>09:00 Opening</td>
<td></td>
</tr>
<tr>
<td>09:30 Keynote I: Lawrence O’Gorman</td>
<td></td>
</tr>
<tr>
<td>10:30 Coffee Break</td>
<td></td>
</tr>
<tr>
<td>11:00 Session 1: Word Spotting</td>
<td></td>
</tr>
<tr>
<td>12:00 Session 2: Handwriting Recognition</td>
<td></td>
</tr>
<tr>
<td><strong>13:00 Lunch Break</strong></td>
<td></td>
</tr>
<tr>
<td>14:30 Session 3: Historical Document Analysis</td>
<td></td>
</tr>
<tr>
<td>16:00 Poster Session I &amp; Coffee</td>
<td></td>
</tr>
<tr>
<td>17:30 Session 4: Databases and Benchmarking</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thursday, April 26</th>
<th>Kuppelsaal</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30 Registration</td>
<td></td>
</tr>
<tr>
<td>09:00 Session 5: Scene Text Detection and Recognition</td>
<td></td>
</tr>
<tr>
<td>10:30 Coffee Break</td>
<td></td>
</tr>
<tr>
<td>11:00 Discussion Groups</td>
<td></td>
</tr>
<tr>
<td><strong>13:00 Lunch Break</strong></td>
<td></td>
</tr>
<tr>
<td>14:30 Session 6: Document Analysis Applications</td>
<td></td>
</tr>
<tr>
<td>16:00 Poster Session II &amp; Coffee</td>
<td></td>
</tr>
<tr>
<td>18:00 Social Event &amp; Workshop Banquet</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Friday, April 27</th>
<th>Kuppelsaal</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30 Registration</td>
<td></td>
</tr>
<tr>
<td>09:00 Keynote II: Rolf Ingold</td>
<td></td>
</tr>
<tr>
<td>10:00 Session 7: Document Understanding</td>
<td></td>
</tr>
<tr>
<td>11:00 Coffee Break</td>
<td></td>
</tr>
<tr>
<td>11:30 Session 8: Graphics Recognition</td>
<td></td>
</tr>
<tr>
<td><strong>13:00 Lunch Break</strong></td>
<td></td>
</tr>
<tr>
<td>14:30 Session 9: Forensic Document Analysis</td>
<td></td>
</tr>
<tr>
<td>16:00 Discussion Group Reports</td>
<td></td>
</tr>
<tr>
<td>17:00 Conclusion</td>
<td></td>
</tr>
</tbody>
</table>
Keynotes

From Digital Libraries to Kind Cameras
Lawrence O’Gorman - Wednesday, April 25 09:30

In the last 30 years, we have made great strides in computer analysis and understanding of signals from images to documents to video. In this talk, I describe projects whose initial objective was a useful and disruptive - and sometimes fun - multimedia recognition system, but for which security issues were discovered that complicated design and usability.

The first project involves document layout analysis methods to facilitate one of the first digital libraries, Bell Labs RightPages. However, publishers would not offer material through the system until we developed watermarking methods to assert their ownership. The second project is a voice-only system for healthcare workers to enable hands-free communications. But the system was impractical without authentication: how do you securely speak a password? The third project was for security purposes only, to design a counterfeit-resistant photo-ID card that can be retrofitted to current non-secure cards, printed on paper, and even duplicated. We accomplished this in the early days of public key cryptography. Finally I will describe current work in “Kind Cameras”, for which video analytics methods have been developed to extend past security cameras to interactive cameras for fun and art.

Lessons from 10 Years of Experience on Historical Document Analysis
Rolf Ingold - Friday, April 27 09:00

Libraries and archives all around the world continuously increase their efforts in digitizing historical manuscripts. Integrating such manuscripts into digital libraries requires meaningful information for indexing. To support the extraction of the needed meta-information or to provide full-text transcription, advanced pattern recognition and machine learning methods are required. This talk will describe the outcome of a series of "HisDoc" research projects funded by the Swiss National Foundation, covering pioneering attempts to study the whole processing chain from layout analysis to information retrieval of historical manuscripts, including script analysis, word spotting and handwriting recognition. This description will be complemented with an overview of other related research projects, in order to convey the current state of the art in the field and outline future trends.
Tutorials  Tuesday, April 24

09:30 Tutorial 1
Introduction to DL in Theory and Practice  Kuppelsaal
René Donner, contextflow, Austria

10:30 Coffee Break

11:00 Tutorial 2
Keyword Spotting for Large-Scale Indexing and Search in massive Document collections  Kuppelsaal
Alejandro H. Toselli, Emilio Granell, Joan Puigcerver
Universitat Politècnica de València

11:00 Tutorial 3
Reproducible Research in Document Image Analysis  Seminarraum 202
Marcel Würsch, Michele Alberti, Vinaychandran Pendekandath, Marcus Liwicki
DIVA Group, University of Fribourg, Switzerland

13:30 Lunch

14:30 Tutorial 4
Deep Learning for Document Analysis, Text Recognition, and Language Modeling  Kuppelsaal
Thomas Breuel, NVIDIA Research, USA

19:00 Welcome Reception  TUtheSky
Wednesday April 25

09:00-09:30 Opening
09:30-10:30 Keynote I
Chair: Robert Sablatnig
09:30 Lawrence O’Gorman
From Digital Libraries to Kind Cameras

10:30 Coffee Break

11:00-12:00 Session 1: Word Spotting
Chair: Gernot A. Fink
11:00 Praveen Krishnan, Kartik Dutta and C V Jawahar.
Word Spotting and Recognition using Deep Embedding
11:20 Neha Gurjar, Sebastian Sudholt, and Gernot Fink.
Learning Deep Representations for Word Spotting Under Weak Supervision
11:40 George Retsinas, Giorgos Sfikas, Nikolaos Stamatopoulos,
Georgios Louloudis and Basilis Gatos.
Exploring critical aspects of CNN-based Keyword Spotting. A PHOCNet study.

12:00-13:00 Session 2: Handwriting Recognition
Chair: Marcus Liwicki
12:00 Frédéric Rayar, Masanori Goto and Seiichi Uchida.
CNN training with graph-based sample preselection: application to handwritten character recognition
12:20 Kartik Dutta, Praveen Krishnan, Minesh Mathew and C V Jawahar.
Unconstrained Handwriting Recognition on Devanagari Script using a new Benchmark Dataset
12:40 Sana Khamekhem, Yousri Kessentini, Slim Kanoun and Jean-Marc Ogier.
Offline Arabic Handwriting Recognition Using BLSTMs Combination

13:00-14:30 Lunch Break
14:30-16:00 Session 3: Historical Document Analysis
Chair: Basilis Gatos
14:30 Michael Fink, Thomas Layer, Georg Mackenbrock and Michael Sprinzl.
Baseline Detection in Historical Documents using Convolutional U-Nets
14:50 Edgard Chammas, Chafic Mokbel and Laurence Likforman-Sulem.
Handwriting Recognition of Historical Documents with few labeled data
15:10 Michael Stauffer, Andreas Fischer and Kaspar Riesen.
Graph-Based Keyword Spotting in Historical Documents Using Context-Aware Hausdorff Edit Distance
15:30 Daniel Stromer, Vincent Christlein, Andreas Maier, Xiaolin Huang, Patrick Zippert, Eric Helmecke and Tino Hausotte.
Non-Destructive Digitization of Soiled Historical Chinese Bamboo Scrolls

16:00-17:30 Poster Session I & Coffee Break
Chair: Michael Blumenstein

17:30-18:30 Session 4: Databases and Benchmarking
Chair: Andreas Fischer
17:30 Dimosthenis Karatzas, Lluis Gomez, Marçal Rusiñol and Anguelos Nicolaou.
The Robust Reading Competition Annotation and Evaluation Platform
17:50 Prashant Singh, Ekta Vats and Anders Hast.
Learning Surrogate Models of Document Image Quality Metrics for Automated Document Image Processing
18:10 Christian Clausner and Apostolos Antonacopoulos.
Ontology and Framework for Semantic Labelling of Document Data and Software Methods
Thursday April 26

09:00-10:30 Session 5: Scene Text Detection and Recognition
Chair: Stefan Pletschacher
09:00 Wafa Khelif, Nibal Nayef, Jean-Christophe Burie, Adel Alimi and Jean-Marc Ogier.
Learning Text Component Features via Convolutional Neural Networks for Scene Text Detection
09:20 Liuan Wang, Jun Sun and Seiichi Uchida.
Text Line Extraction based on Integrated K-shortest Paths Optimization
09:40 Xiaoyu Li, Yonghong Song and Yuanlin Zhang.
A Bidirectional Information Aggregation Architecture for Scene Text Detection
10:00 Lluis Gomez, Marçal Rusiñol and Dimosthenis Karatzas.
Cutting Sayre’s Knot: Reading Scene Text without Segmentation.
Application to Utility Meters.

10:30-11:00 Coffee Break

11:00-13:00 Discussion Groups
Chairs: Alicia Fornés, Marcus Liwicki

13:00-14:30 Lunch Break

14:30-16:00 Session 6: Document Analysis Applications
Chair: Koichi Kise
Online Video Text Detection with Markov Decision Process
14:50 Olivier Augereau, Clément Jacquet, Journet Nicholas and Koichi Kise.
Vocabulometer: a Web Platform for Document and Reader Mutual Analysis
15:10 Carlos David Martinez Hinarejos, Emilio Granell and Verónica Romero.
Comparing different feedback modalities in assisted transcription of manuscripts
15:30 Mark Vol, Andrew Krutsko, Nicolas Stefanovitch and Denis Postanogov.
Automatic recovery of corrupted font encoding in PDF documents using CNN-based symbol recognition with language model

16:00-17:30 Poster Session II & Coffee Break
Chairs: Jean-Marc Ogier

18:00 Social Event, Karlsplatz Tram Station
19:00 Workshop Banquet, Rathauskeller
Friday  

09:00-10:00 Keynote II  
Chair: Robert Sablatnig  
09:00 Rolf Ingold  
Lessons from 10 Years of Experience on Historical Document Analysis

10:00-11:00 Session 7: Document Understanding and Table Recognition  
Chair: Dan Lopresti  
10:00 George Nagy and David Embley.  
Green Interaction for Extracting Family Information from OCR’d Books  
10:20 Hervé Déjean, Jean-Luc Meunier, Stéphane Clinchant, Eva Maria Lang and Florian Kleber.  
Comparing Machine Learning Approaches for Table Recognition in Historical Register Books  
10:40 Elvis Koci, Maik Thiele, Oscar Romero and Wolfgang Lehner.  
Table Recognitions in Spreadsheets via a Graph Representation

11:00-11:30 Coffee Break

11:30-13:00 Session 8: Graphics Recognition  
Chair: Alicia Fornés  
Printed/Handwritten Texts and Graphics Separation in Complex Documents using Conditional Random Fields  
11:50 Frank Dennis Julca-Aguilar and Nina S. T. Hirata.  
Symbol detection in online handwritten graphics using Faster R-CNN  
12:10 Penghui Sun, Yan Chen, Xiaoqing Lu, Bei Wang, Jingwei Qu and Zhi Tang.  
A Free-sketch Recognition Method for Chemical Structural Formula  
12:30 Alexander Pacha, Kwon-Young Choi, Bertrand Couasnon, Yann Ricquebourg, Richard Zanibbi and Horst Eidenberger.  
Handwritten Music Object Detection: Open Issues and Baseline Results

13:00-14:30 Lunch Break
Friday, April 27

14:30-16:00 Session 9: Forensic Document Analysis
Chair: Robert Sablatnig
14:30 Vincent Christlein and Andreas Maier. Encoding CNN Activations for Writer Recognition
14:50 Fredrik Wahlberg. Gaussian Process Classification as Metric Learning for Forensic Writer Identification
15:10 Vinh Loc Cu, Jean-Christophe Burie and Jean-Marc Ogier. Stable regions and object fill-based approach for document images watermarking
15:30 Ulrich Scherhag, Christian Rathgeb and Christoph Busch. Towards detection of morphed face images in electronic travel documents

16:00-17:00 Discussion Group Reports
Chairs: Alicia Fornés, Marcus Liwicki

17:00-17:30 Conclusion and Awards
Chair: Robert Sablatnig

Events

Welcome Attendance
Tuesday, April 24 19:00

The welcome attendance will take place at TUtheSky, which is located in the 11th floor at the Campus Getreidemarkt near the city center. Enjoy the great view while eating some finger food and drinking Austrian wine and beer. Also take the possibility to have nice talks with all other participants of DAS 2018.
Events

**Social Event**  
Thursday, April 26 18:00
We will have a guided tour with a rented tram which runs around the Vienna ring, an Austrian World Heritage Site. The majestic boulevard was laid out in the mid-19th century around the center of the city, replacing the old city wall and the glacis. Ornate buildings such as the state opera, parliament buildings, city hall, Burgtheater, stock exchange and numerous palaces were erected along the resulting boulevard. We will start at 18:00 at Karlsplatz tram station and will end directly at the Rathaus where the Conference Dinner takes place.

**Workshop Banquet**  
Thursday, April 26 19:00
The conference banquet will be held at the city hall, Rathauskeller. The city hall is one of the most splendid amongst the numerous monumental buildings in Vienna. Don't miss the announcement of best paper and best student paper winners and join your DAS colleagues for a dinner of wining, dining, and shining examples of research quality.
Poster Session I

**Wednesday, April 25 16:00-17:30**

Chair: Michael Blumenstein

Zhen Zhu, Minghui Liao, Baoguang Shi and Xiang Bai.
Feature Fusion for Scene Text Detection

Bartosz Bogacz and Hubert Mara.
From Extraction to Spotting: An Analysis Workflow for Cuneiform Script

Piercarlo Dondi, Alessandro Danani, Luca Lombardi, Marco Malagodi and Maurizio Licchelli.
Handwriting identification of short historical manuscripts

Sami-Ur-Rehman, Burhan Ul Tayyab, Muhammad Ferjad Naeem, Adnan Ul-Hasan and Faisal Shafait.
A Multi-Faceted OCR Framework for Artificial Urdu News Ticker Text Recognition

Sukalpa Chanda, Emmanuel Okafor and Lambert Schomaker.
Deep Learning for Classification and as Tapped-Feature Generator in Medieval Word-Image Recognition

David Aldavert and Marçal Rusiñol.
Synthetically generated semantic codebook for Bag-of-Visual-Words based word spotting

Reem Alaasam, Berat Kurar and Jihad El-Sana.
Word Spotting Using Convolutional Siamese Network

Han Xiao, Jun Sun and Xiaoyi Yu.
Compact Binary Feature for Open Set Recognition

Vincent Poulain d'Andecy, Aurélie Joseph and Jean-Marc Ogier.
InDUS : Incremental Document Understanding System, focus on document Classification

Feature Selection for Document Flow Segmentation

Vincent Poulain d'Andecy, Emmanuel Hartmann and Marçal Rusiñol.
Field Extraction by hybrid incremental and a priori structural templates

Yuki Daiku, Motoi Iwata, Olivier Augereau and Koichi Kise.
Comics Story Representation System Based on Genre

Florian Westphal, Niklas Lavesson and Håkan Grahn.
Document Image Binarization Using Recurrent Neural Networks

Ruochen Wang, Song Wang and Jun Sun.
Offset Neural Network for Document Orientation Identification

Quang Anh Bui, David Molard and Salvatore Tabbone.
Predicting mobile-captured document images sharpness quality
Muhammad Hanif, Anna Tonazzini, Pasquale Savino, Emanuele Salerno and Greg Tsagkatakis.
Document Bleed-through Removal using Sparse Image Inpainting

Christoph Wick and Frank Puppe.
Fully Convolutional Neural Networks for Page Segmentation of Historical Document Images

David Aldavert and Marçal Rusiñol.
Manuscript text line detection and segmentation using second-order derivatives analysis

Syed Saqib Bukhari, Srie Raam Mohan and Andreas Dengel.
Layout Error Correction using Deep Neural Networks

Xiaode Zhang, Liangcai Gao, Yilun Huang, Yaoxiong Huang, Lianwen Jin, Dong An and Zhi Tang.
A Sequence Labeling Based Approach for Character Segmentation of Historical Documents

Maximilian Klockmann, Marco Filax, Martin Reiß and Frank Ortmeier.

Gantugs Atarsaikhan, Brian Kenji Iwana and Seiichi Uchida.
Contained Neural Style Transfer for Decorated Logo Generation

Teemu Ruokolainen and Kimmo Kettunen.
À la recherche du nom perdu – Searching for Named Entities with Stanford NER in a Finnish Historical Newspaper and Journal Collection

Vinodh Rajan and H. Siegfried Stiehl.
Bringing Paleography to the Table: Developing an Interactive Manuscript Exploration System for Large Multi-Touch Devices

Shubham Gupta, Jayanta Mukherjee, Dipali Bhattacharya, Himadri Majumder, Rahul Roy and Bidyut Chaudhuri.
An Efficient approach for designing Deep Learning Network on Title extraction for Architecture, Engineering & Construction Documents

Mohammad Mohsin Reza, Md. Ajrak Rakib, Syed Saqib Bukhari and Andreas Dengel.
A High-Performance Document Image Layout Analysis for Invoices

Anoop R Katti, Johannes Hoehne, Steffen Bickel and Jean Baptiste Faddoul.
Applying Sequence-to-Mask Models for Information Extraction from Invoices
Poster Session II

**Thursday, April 26 16:00-17:30**

Chair: Jean-Marc Ogier

Syed Saqib Bukhari, Manabendra Saha, Praveen Kumar Badimala Giridhara, Manesh Kumar Lohano and Andreas Dengel.

anyAlign: An Intelligent and Interactive Text-Alignment Web-Application for Historical Document

Verónica Romero, Alejandro Toselli, Vicente Bosch Campos, Joan Andreu Sanchez and Enrique Vidal.

Automatic Alignment of Handwritten Images and Transcripts for Training Handwritten Text Recognition systems

Marcel Würsch, Marcus Liwicki and Rolf Ingold.

Web Services in Document Image Analysis - Recent Developments and the Importance of Building an Ecosystem

Mathias Seuret, Manuel Bouillon, Fotini Simistira, Marcel Würsch, Marcus Liwicki and Rolf Ingold.

A Semi-Automatized Modular Annotation Tool for Ancient Manuscript Annotation

Aliona Dangla, Elodie Puybareau, Guillaume Tochon and Jonathan Fabrizio.

A first step toward a fair comparison of evaluation protocols for text detection algorithms

Tobias Grüning, Markus Diem, Florian Kleber, Stefan Fiel and Roger Labahn.

READ-BAD: A New Dataset and Evaluation Scheme for Baseline Detection in Archival Documents

Romain Karpinski and Abdel Belaid.

ZoneMapAlt: An alternative to the ZoneMap metric for zone segmentation and classification

Alireza Alaei, Romain Raveaux, Donatello Conte and Bela Stantic.

“Quality” vs. “Readability” in Document Images: Statistical Analysis of Human Perception

Fahimeh Alaei, Alireza Alaei, Umapada Pal and Michael Blumenstein.

Evaluation of Gist Operator for Document Image Retrieval

Nabil Ghanmi and Ahmad Montaser Awal.

A New Descriptor for Pattern Matching: Application to Identity Document Verification

Chandranath Adak, Simone Marinai, Bidyut B. Chaudhuri and Michael Blumenstein.

Offline Bengali Writer Verification by PDF-CNN and Siamese Net

Minh On Vu Ngoc, Jonathan Fabrizio and Thierry Géraud.

Saliency-Based Detection of Identity Documents Captured by Smartphones

Muhammad Jaleed Khan, Adeel Yousaf, Khurram Khurshid, Asad Abbas and Faisal Shafait.

Automated Forgery Detection in Multispectral Document Images using Fuzzy Clustering

Manuel Carbonell, Mauricio Villegas, Alicia Fornés and Josep Lladós.

Joint Recognition of Handwritten Text and Named Entities with a Neural End-to-end Model
Martin Schall, Marc-Peter Schambach and Matthias Franz.
Multi-Dimensional Connectionist Classification: Reading Text in One Step

Bappaditya Chakraborty, Bikash Shaw, Jayanta Aich, Ujjwal Bhattacharya and Swapan Kr. Parui.
Does Deeper Network Lead to Better Accuracy: A Case Study on Handwritten Devanagari Characters

Shah Nawaz, Alessandro Calefati, Nisar Ahmed and Ignazio Gallo.
Hand Written Characters Recognition via Deep Metric Learning

Christian Reul, Uwe Springmann, Christoph Wick and Frank Puppe.
Improving OCR Accuracy on Early Printed Books by utilizing Cross Fold Training and Voting

Syed Saqib Bukhari, Kareem Mokhtar and Andreas Dengel.
OCR Error Correction: State-of-the-art vs An NMT Based Approach

Partha Sarathi Mukherjee, Ujjwal Bhattacharya and Swapan Kr. Parui.
An Efficient Feature Vector for Segmentation-free Recognition of Online Cursive Handwriting Based on a Hybrid Deep Neural Network

Rathin Radhakrishnan Nair, Nishant Sankaran, Bhargava Urala Kota, Sergey Tulyakov, Srirangaraj Setlur and Venu Govindaraju.
Knowledge Transfer using Neural network based approach for Handwritten Text Recognition

Avadesh Meduri and Navneet Goyal.
Optical Character Recognition for Sanskrit using Convolution Neural Networks

Kimmo Kettunen and Mika Koistinen.
Re-OCR in Action – Using Tesseract to re-OCR Finnish Fraktur from 19th and Early 20th Century Newspapers and Journals

Fuma Horie and Hideaki Goto.
High-Accuracy Japanese Scene Character Recognition Using Synthetic Scene Characters and Multi-Scale Voting Classifier

Soichi Tashima and Hideaki Goto.
Fast Handwritten Chinese Character Recognition Using Convolutional Neural Network and Hierarchical Overlapping Clustering

Martin Schall, Haiyan Buehrig, Marc-Peter Schambach and Matthias Franz.
LSTM Networks for Edit Distance Calculation with Exchangeable Dictionaries

Christian Clausner and Apostolos Antonacopoulos.
Continuous Competition on Recognition of Documents with Complex Layouts - RDCL

Jake Walker, Yasuhisa Fujii and Ashok Popat. A Web-Based OCR Service for Documents

Jialuo Chen, Alicia Fornés, Joan Mas, Josep Llados and Joana Maria Pujadas.
Word-Hunter: Speeding up the Transcription of Manuscripts via Gamesourcing
Floorplan

Conference Hall
Kuppelsaal
4th Floor
Seminarraum 202
2nd Floor
Karlsplatz 13
1040 Vienna
Organization

General Chairs
Robert Sablatnig Austria
Florian Kleber Austria

Program Chairs
Basilis Gatos Greece
Koichi Kise Japan
Dan Lopresti USA
Jean-Marc Ogier France

Publicity Chairs
Markus Diem Austria
David Doermann USA
Gernot A. Fink Germany

Discussion Group Chairs
Alicia Fornés Spain
Marcus Liwicki Germany

Publication Chair
Stefan Pletschacher UK

Tutorial Chairs
Michael Blumenstein Australia
Stefan Fiel Austria
Cheng-Lin Liu China

Program Committee

Adel Alimi Germany
Apostolos Antonacopoulos UK
Oliver Augereau Japan
Elisa H. Barney Smith USA
Abdel Belaid France
Vincent Christlein Germany
Hervé Déjean France
Andreas Dengel Germany
Rafael Dueire Lins Brazil
Véronique Eglin France
Jihad El-Sana Israel
Andreas Fischer Switzerland
Volkmar Frinken USA
Utpal Garain India
Lluis Gomez Spain
Venu Govindaraju USA
Masakazu Iwamura Japan
Motoi Iwata Japan
Dimosthenis Karatzas Spain
Bart Lamiroy France
Laurence Likforman-Sulem France
Josep Lladós Spain
George Louloudis Greece
Andreas Maier Germany
R. Manmatha USA
Simone Marinai Italy
Jean-Luc Meunier France
Gunter Muehlberger Austria
Masaki Nakagawa Japan
Premkumar Natarajan USA
Umapada Pal India
Shivakumara Palaiahnakote Malaysia
Thierry Paquet France
Vincent Poulain D’Andecy France
Ioannis Pratikakis Greece
Jean-Yves Ramel France
Oriol Ramos Terrades Spain
Marcel Rusinol Spain
Joan Andreu Sanchez Spain
Marc-Peter Schambach Germany
Srirangaraj Setlur USA
Faisal Shafait Pakistan
Fotini Simistira Switzerland
Nikolaos Stamatopoulos Greece
Karl Tombre France
Alejandro Toselli Spain
Seiichi Uchida Japan
Mauricio Villegas Turkey
Berrin Yanikoglu Turkey
Konstantinos Zagoris Greece
Richard Zanibbi USA
<table>
<thead>
<tr>
<th>Time</th>
<th>Tuesday, April 24</th>
<th>Wednesday, April 25</th>
<th>Thursday, April 26</th>
<th>Friday, April 27</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00</td>
<td>Registration</td>
<td>Registration</td>
<td>Registration</td>
<td>Registration</td>
</tr>
<tr>
<td>08:30</td>
<td>Rene Donner</td>
<td>Lawrence O'Gorman</td>
<td>Thomas Breuel</td>
<td>Rolf Ingold</td>
</tr>
<tr>
<td>09:00</td>
<td>Coffee Break</td>
<td>Coffee Break</td>
<td>Coffee Break</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>09:30</td>
<td>Opening</td>
<td>Discussion groups</td>
<td>Discussion groups</td>
<td>Discussion group reports</td>
</tr>
<tr>
<td>10:00</td>
<td>Coffee Break</td>
<td>Handwriting Recognition</td>
<td>Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td>10:30</td>
<td>Lunch</td>
<td>Historical Document Analysis</td>
<td>Teasers</td>
<td>Teasers</td>
</tr>
<tr>
<td>11:00</td>
<td>Lunch</td>
<td>Forensic Document Analysis</td>
<td>Poster Session I &amp; Coffee</td>
<td>Poster Session II &amp; Coffee</td>
</tr>
<tr>
<td>11:30</td>
<td>Lunch</td>
<td>Databases and Benchmarking</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>12:00</td>
<td>Lunch</td>
<td>Workshop banquet</td>
<td>Social Event</td>
<td>Social Event</td>
</tr>
<tr>
<td>12:30</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>13:00</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>13:30</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>14:00</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>14:30</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>15:00</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>15:30</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>16:00</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>16:30</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>17:00</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>17:30</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>18:00</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>18:30</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>19:00</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>19:30</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
<tr>
<td>20:00</td>
<td>Lunch</td>
<td>Social Event</td>
<td>Workshop banquet</td>
<td>Workshop banquet</td>
</tr>
</tbody>
</table>
Participating Countries