

14th INTERNATIONAL CONFERENCE
ON FRONTIERS IN HANDWRITING
RECOGNITION

ICFHR 2014

Crete Island - Greece

1-4 September 2014

Conference Program



Athena Research Center
Research and Innovation Center in Information,
Communication and Knowledge Technologies



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Conference Organization

ICFHR 2014

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Social Program



Welcome Reception

Monday, 1 September 2014, 20:30

The Welcome Reception of the 14th ICFHR 2014 will be held at “PITHOS RESTAURANT VERANDA” of Creta Maris Beach Resort

Tour to Knossos

Wednesday, 3 September 2014, 17:30

A flashback to Crete's ancient history. Knossos is the site of the most important and better known palace of Minoan Civilization. According to tradition, it was



the seat of the legendary king Minos. The Palace is also connected with thrilling legends, such as the myth of the Labyrinth with the Minotaur, and the story of Daidalos and Icaros. Walking round the narrow corridors of the labyrinth construction you'll have the opportunity to see artifacts and symbols of the culture developed in Crete 4000 years ago. The myths come alive again after visiting the Palace of King Minos at Knossos. Services included transportation to the archaeological site of Knossos, entrance fees and English speaking guide. You are advised to **wear** comfortable shoes, take your camera with you and enjoy the tour!



Conference Dinner

Wednesday, 3 September 2014, 21:30

The unique setting of “Archontiko tis Rodias Restaurant” make it an excellent choice for an impressive gala. The luxury and the elegant decor create a romantic and warm atmosphere. Only a few kilometers outside Heraklion city, “Archontiko tis Rodias Restaurant ” welcomes you and guarantees it will take you on to a magical journey that will awaken your senses.

IAPR Invited Talk I**Jeremy Bentham and the Computer Age:
Reflections on Crowdsourcing the Transcription
of Handwritten Documents****Philip Schofield**

Bentham Project, Faculty of Laws, University College London

Abstract

Jeremy Bentham (1748–1832), the English philosopher and reformer, is known as the founder of utilitarianism, the doctrine that states that the right action is that which promotes the greatest happiness of the greatest number. The Bentham Project was established at UCL in 1959 in order to produce a new authoritative edition of Bentham's Collected Works, based in part on printed materials, but also on over 70,000 manuscript folios deposited mainly in UCL Library. To date, thirty volumes out of a projected eighty have been published in the new edition. I will show that Bentham himself was a great innovator in terms of the use of new technology, and that some of his schemes, for instance conversation tubes in his planned panopticon prison, would make much more sense in today's age of digital communication. I will then describe the use of new technology in the Bentham edition, from the first use of computers in 1985 to transcribe manuscripts, through to our scholarly crowdsourcing platform Transcribe Bentham (TB) and involvement in the tranScriptorium project, which is developing software that will transcribe handwritten historical documents. TB was launched in 2010, and by March 2014 over 7,000 documents had been transcribed and tagged to a very high standard by volunteers. I will reflect, from the perspective of an academic in the humanities, on the challenges and opportunities that have arisen in attempting to embed new technology in a traditional scholarly publishing programme, and try to assess the respective costs and benefits.

Biography

Philip Schofield is Professor of the History of Legal and Political Thought in the Faculty of Laws and Director of the Bentham Project, University College London. He is General Editor of the new authoritative edition of The Collected Works of Jeremy Bentham, and has edited or co-edited nine volumes in the series. As well as a series of articles and book chapters, he has published two monographs on Bentham: *Utility and Democracy: the political thought of Jeremy Bentham*, Oxford University Press (2006), winner of the WJM Mackenzie Book Prize awarded by the UK's Political Studies Association; and *Bentham: A Guide for the Perplexed*, Continuum (2009).

IAPR Invited Talk II

Handwriting: New Times, New Needs



Hans-Leo Teulings
NeuroScript, Tempe, Arizona, USA

Abstract

Handwriting is a fine motor skill. It is the most taught motor skill in the world. It is getting less and less attention as compared to recreative motor skills and sports. Today we enjoy affordable mobile computers, touch tablets, virtual keyboards, spelling and grammar correctors, and speech-to-text recognition.

Handwritten signatures are getting out of fashion in favour of other personal identification methods. Will the skill of handwriting become a historic skill? We foresee an upswing in the use of handwriting. The newest mobile devices will be standard equipped with the amazingly versatile pens. Even finger gesture can now be recorded. Handwriting in note taking could regain an important role in advanced education.

Handwriting recording and analysis offers a cost-effective window into the functioning of the nervous system. It is used in fundamental research and in medical applications. We will present measures of handwriting skill in schools. If we wish to contribute with handwriting processing in today's society we need to identify today's needs for online and offline handwriting processing. There will be a need for easy to demonstrate, generic mobile pen applications.

Biography

Hans-Leo Teulings received an MSc in experimental physics and biophysics and a PhD in experimental psychology at the University of Nijmegen, The Netherlands. During more than 30 years he pioneered handwriting movement recording. He contributed to grants and research papers while working at the universities of Nijmegen, Trondheim (Norway), Cambridge (UK), Genoa (Italy), Madison (Wisconsin, USA), and Tempe (Arizona, USA). Since 1997 he is CEO of NeuroScript. This company's mission is to support researchers worldwide with developing handwriting applications, e.g., using the MovAlyzeR handwriting recording and analysis platform.

The Organizing Committee of the 14th International Conference
on Frontiers in Handwriting Recognition

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ICFHR 2014 Detailed Program

Zeus Conference Hall
Conference Center, Creta Maris

Monday, 1 September 2014

- 08.00-09.00** **Registration**
- 09.00-11.30** **Tutorial 1**
Handwritten Text Recognition: Word-Graphs, Keyword Spotting and Computer Assisted Transcription
Moisés Pastor, Verónica Romero, Joan Andreu Sánchez, Alejandro H. Toselli and Enrique Vidal
- 11.30-12.00** **Coffee break**
- 12.00-13.00** **Tutorial 1**
Handwritten Text Recognition: Word-Graphs, Keyword Spotting and Computer Assisted Transcription
Moisés Pastor, Verónica Romero, Joan Andreu Sánchez, Alejandro H. Toselli and Enrique Vidal
- 13.00-14.00** **Lunch**
- 14.00-16.30** **Tutorial 1**
Handwritten Text Recognition: Word-Graphs, Keyword Spotting and Computer Assisted Transcription
Moisés Pastor, Verónica Romero, Joan Andreu Sánchez, Alejandro H. Toselli and Enrique Vidal
- 16.30-17.00** **Coffee break**
- 17.00-18.00** **Tutorial 1**
Handwritten Text Recognition: Word-Graphs, Keyword Spotting and Computer Assisted Transcription
Moisés Pastor, Verónica Romero, Joan Andreu Sánchez, Alejandro H. Toselli and Enrique Vidal
- 18.00-20.30** **Registration**
- 20.30-22.30** **Welcome Reception – Pithos Restaurant Veranda, Creta Maris Beach Resort**
- Tutorial 2**
Statistical Models for Handwriting Recognition and Retrieval
Gernot A. Fink
- Tutorial 2**
Statistical Models for Handwriting Recognition and Retrieval
Gernot A. Fink
- Tutorial 3**
Automatic signature verification: state of the art and recent trends
Angelo Marcelli, Guiseppa Pirlo, Marcus Liwicki, Michael Blumenstein
- Tutorial 3**
Automatic signature verification: state of the art and recent trends
Angelo Marcelli, Guiseppa Pirlo, Marcus Liwicki, Michael Blumenstein

Tuesday, 2 September 2014

- 08.00-09.00** **Registration**
- 09.00-09.30** **Opening Ceremony**
- 09.30-10.30** **IAPR Invited Talk I**
Jeremy Bentham and the Computer Age: Reflections on Crowdsourcing the Transcription of Handwritten Documents
Prof. Philip Schofield, Bentham Project, Faculty of Laws, University College London

10.30 - 11.30 **Session 1 Word Spotting**
Chair: Véronique Églin

A Simple and Fast Word Spotting Method
Alon Kovalchuk, Lior Wolf and Nachum Dershowitz

Segmentation-based Historical Handwritten Word Spotting using Document-Specific Local Features
Konstantinos Zagoris, Ioannis Pratikakis and Basilis Gatos

An Historical Handwritten Arabic Dataset for Segmentation-Free Word Spotting - HADARA80P
Werner Pantke, Martin Dennhardt, Daniel Fecker, Volker Märgner and Tim Fingscheidt

11.30-12.00 **Coffee break**

12.00-13.40 **Session 2: Document Image Pre-processing Techniques**
Chair: Nikos Papamarkos

Text/Non-Text Classification in Online Handwritten Documents with Recurrent Neural Networks
Truyen Van Phan and Masaki Nakagawa

Handwritten/printed text separation Using pseudo-lines for contextual re-labeling
Ahmad Montaser Awal, Abdel Belaïd and Vincent Poulain d'Andecy

Visual perception of unitary elements for layout analysis of unconstrained documents in heterogeneous databases
Baptiste Poirriez, Aurélie Lemaitre and Bertrand Coüasnon

A Novel Transcript Mapping Technique for Handwritten Document Images
Nikolaos Stamatopoulos, Basilis Gatos and Georgios Louloudis

Bleed-through Removal by Learning a Discriminative Color Channel
Mauricio Villegas and Alejandro H. Toselli

13.40-14.50 **Lunch**

14.50-16.40 **Session 3: Signature Verification**
Chair: Réjean Plamondon

Poset Description of Grid Features and Application to Off-Line Signature Verification
Elias N. Zois, Evangelos Zervas, Konstantina Barkoula, George Economou and Spiros Fotopoulos

Cognitive Inspired Model to Generate Duplicated Static Signature Images
Moises Diaz-Cabrera, Miguel A. Ferrer and Aythami Morales

On-line Signature Verification by Multi-Domain Classification
Giuseppe Pirlo, Vito Cuccovillo, Donato Impedovo and Paolo Mignone

Automatic Online Signature Verification based only on FHE Features: an Oxymoron ?
Marianela Parodi, Juan C. Gómez and Linda Alewijnse

A Robust Online Signature based Cryptosystem
Ashok K. Bhateja, Santanu Chaudhury and Praveen K. Saxena

16.40-17.00 **Coffee break**

17.00-18.00 **Poster Session 1**

Hybrid Feature Selection for Historical Document Layout Analysis
Hao Wei, Kai Chen, Rolf Ingold and Marcus Liwicki

LAMIS-MSHD: A Multi-Script offline Handwriting Database
Chawki Djeddi, Abdeljalil Gattal, Labiba Souici-Meslati, Imran Siddiqi, Youcef Chibani and Haikal El Abed

Text Line Segmentation for Handwritten Documents Using Constrained Seam Carving
Xi Zhang and Chew Lim Tan

A Novel Feature Selection and Extraction Technique for Classification
Kratarth Goel, Raunaq Vohra and Ainesh Bakshi

Assisting Forensic Writer Verification by Visualizing Diversity of Digit Handwritings: An Approach by Multidimensional Scaling of Earth Mover's Distance
Yoshinori Akao, Atsushi Yamamoto and Yoshiyasu Higashikawa

Online Handwritten Stroke Type Determination Using Descriptors Based on Spatially and Temporally Neighboring Strokes
Yuto Yamaji, Tomoyuki Shibata and Yojiro Tonouchi

Connected Bond Recognition for Handwritten Chemical Skeletal Structural Formulas

Peng Tang, Siu Cheung Hui and Chi-Wing Fu

A Novel HMM Decoding Algorithm Permitting Long-Term Dependencies and its Application to Handwritten Word Recognition

Volkmar Frinken, Ryosuke Kakisako and Seiichi Uchida

Applications of Recurrent Neural Network Language Model in Offline Handwriting Recognition and Word Spotting

Nan Li, Jinying Chen, Huaigu Cao, Bing Zhang and Prem Natarajan

A Coarse-to-Fine Approach for Layout Analysis of Ancient Manuscripts

Abdelkadir Asi, Rafi Cohen, Klara Kedem, Itshak Dinstein and Jihad El-Sana

Table detection in handwritten chemistry documents using conditional random fields

Nabil Ghanmi and Abdel Belaïd

Novel Handwritten Words and Documents Databases of Five Middle Eastern Languages

Nicola Nobile, Muna Khayyat, Louisa Lam and Ching Y. Suen

A Comparison of Recognition Strategies for Printed/Handwritten Composite Documents

Bastien Moysset, Ronaldo Messina and Christopher Kermorvant

Recognition of Spatial Relations in Mathematical Formulas

Fotini Simistira, Vassilis Papavassiliou, Vassilis Katsouras and George Carayannis

Evaluating Threshold for Retraining Rule in Semi-Supervised Learning using Multi-Expert System

Sebastiano Impedovo, Donato BarbuZZi and Giuseppe Pirlo

A* Path Planning for Line Segmentation of Handwritten Documents

Olarik Surinta, Michiel Holtkamp, Faik Karabaa, Jean-Paul van Oosten, Lambert Schomaker and Marco Wiering

Word-Graph and Character-Lattice Combination for KWS in Handwritten Documents

Joan Puigcerver, Alejandro H. Toselli and Enrique Vidal

Improving Signature-Based Biometric Cryptosystems Using Cascaded Signature Verification-Fuzzy Vault (SV-FV) Approach

George S. Eskander, Robert Sabourin and Eric Granger

Evaluation of Geometric Context Models for Handwritten Numeral String Recognition

Yi-Chao Wu, Fei Yin and Cheng-Lin Liu

A two stage approach for handwritten Malayalam character recognition

Jomy John, K. V. Pramod, Kannan Balakrishnan and Bidyut B. Chaudhuri

Text Alignment from Bimodal Mathematical Expression Sources

Sofiane Medjkoune, Harold Mouchère, Simon Petitrenaud, Christian Viard –Gaudin

Flexible Sequence Matching Technique: Application to Word Spotting in Degraded Documents

Tanmoy Mondal, Nicolas Ragot, Jean-Yves Ramel and Umapada Pal

A New Method for Writer Identification based on Histogram Symbolic Representation

Alireza Alaei and Partha Pratim Roy

Neuromuscular Representation and Synthetic Generation of Handwritten Whiteboard Notes

Andreas Fischer, Réjean Plamondon, Christian O'Reilly and Yvon Savaria

e-Crowds: a mobile platform for browsing and searching in historical demography-related manuscripts

Pau Riba, Jon Almazán, Alicia Fornés, David Fernández-Mota, Ernest Valveny and JosepLladós

A semi-incremental recognition method for on-line handwritten English text

Cuong Tuan Nguyen, Bilan Zhu and Masaki Nakagawa

Combination of Features for Efficient Recognition of Offline Handwritten Devanagari Words

Bikash Shaw, Ujjwal Bhattacharya and Swapan K. Parui

An MQDF-CNN Hybrid Model for Offline Handwritten Chinese Character Recognition

Yanwei Wang, Xin Li, Changsong Liu, Xiaoqing Ding and Youxin Chen

Stroke level user-adaptation for stroke order free online handwriting recognition

D. Dutta, A. Roy Chowdhury, Ujjwal Bhattacharya and Swapan K. Parui

18.00-19.00 **Session 4: Applications I**
Chair: Venu Govindaraju

A graph modeling strategy for multi-touch gesture recognition
Zhaoxin Chen, Eric Anquetil, Harold Mouchère and Christian Viard-Gaudin

Towards style-based dating of historical documents
Sheng He, Petros Sammarra, Jan Burgers and Lambert Schomaker

Off-line Handwritten Bilingual Name Recognition for Student Identification in an Automated Assessment System
Hemmaphan Suwanwiwat, Vu Nguyen, Michael Blumenstein and Umapada Pal

Wednesday, 3 September 2014

09.00-10.00 **IAPR Invited Talk II**

Handwriting: New Times, New Needs
Dr. Hans-Leo Teulings, NeuroScript, Tempe, Arizona, USA

10.00-11.40 **Session 5: Neural Networks for Handwriting Recognition**
Chair: Robert Sabourin

Fast and robust training of recurrent neural networks for offline handwriting recognition
Patrick Doetsch, Michal Kozielski and Hermann Ney

Dropout improves Recurrent Neural Networks for Handwriting Recognition
Vu Pham, Théodore Bluche, Christopher Kermorvant and Jérôme Louradour

Handwritten Character Recognition by Alternately Trained Relaxation Convolutional Neural Network
Chunpeng Wu, Wei Fan, Yuan He, Jun Sun and Satoshi Naoi

The A2iA Multi-lingual Text Recognition System at the second Maudor Evaluation
Théodore Bluche, Maxime Knibbe, Ronaldo Messina, Mohamed Faouzi Benzeghiba, Jérôme Louradour and Christopher Kermorvant

Irrelevant Variability Normalization via Hierarchical Deep Neural Networks for Online Handwritten Chinese Character Recognition
Jun Du

11.40-12.00 **Coffee break**

12.00-13.40 **Session 6: Online Handwriting Recognition**
Chair: Christian Viard-Gaudin

Writer Adaptation using Bottleneck Features and Discriminative Linear Regression for Online Handwritten Chinese Character Recognition
Jun Du, Jin-Shui Hu, Bo Zhu, Si Wei and Li-Rong Dai

A Tibetan Component Representation Learning Method for Online Handwritten Tibetan Character Recognition
Long-Long Ma and Jian Wu

Using Off-line Features and Synthetic Data for On-line Handwritten Math Symbol Recognition
Kenny Davila, Stephanie Ludi and Richard Zanibbi

Large Improvement in Line-direction-free and Character-orientation-free On-line Handwritten Japanese Text Recognition
Yuechan Hao, Bilan Zhu and Masaki Nakagawa

OHRS-MEWA: On-line Handwriting Recognition System with Multi-Environment Writer Adaptation
Lobna Haddad, Tarek M. Hamdani and Adel M. Alimi

13.40-14.50 **Lunch**

Session 7: Language Models for Handwriting Recognition
Chair: Enrique Vidal

Open-lexicon Language Modeling Combining Word and Character Levels
Michał Kozielski, Martin Matysiak, Patrick Doetsch, Ralf Schlüter and Hermann Ney

An intelligent sample selection approach to language model adaptation for hand-written text recognition
Jafar Tanha, Jesse de Does and Katrien Depuydt

15.30-15.50 Coffee break

15.50-16.50 Poster Session 2

A Bayesian Approach to Script Independent Multilingual Keyword Spotting

Gaurav Kumar and Venu Govindaraju

Learning-free text-image alignment for medieval manuscripts

Yann Leydier, Véronique Églin, Stéphane Brès, Dominique Stutzmann

A Database of On-line Handwritten Mixed Objects named "Kondate"

Tomohisa Matsushita and Masaki Nakagawa

Automatic Handwritten Indian Scripts Identification

Rajmohan Pardeshi, Bidyut B. Chaudhuri, Mallikarjun Hangarge and K.C. Santosh

Segmentation-free Keyword Spotting for Bangla Handwritten Documents

Xi Zhang, Umapada Pal and Chew Lim Tan

Word Spotting using Radial Descriptor

Majeed Kassis and Jihad El-Sana

Constrained AdaBoost for Totally-Ordered Global Features

Ryota Ogata, Minoru Mori, Volkmar Frinken and Seiichi Uchida

Word Spotting in Handwritten Text Using Contour-based Models

Angelos P. Giotis, Demetrios P. Gerogiannis and Christophoros Nikou

Offline Hand-Written Musical Symbol Recognition

Sukalpa Chanda, Debleena Das, Umapada Pal and Fumitaka Kimura

Writing Type and Language Identification in Heterogeneous and Complex Documents

David Hebert, Philippine Barlas, Clement Chatelain, Sebastian Adam and Thierry Paquet

Real-time Segmentation of On-line Handwritten Arabic Script

George Kour and Raid Saabne

Pixel Level Handwritten and Printed Content Discrimination in Scanned Documents

Mathias Seuret, Marcus Liwicki and Rolf Ingold

A Neural Network Based Distance Function for the k-Nearest Neighbor Classifier

Szilárd Vajda and Barna Szocs

Feature Weighted Support Vector Machines for Writer-independent On-line Signature Verification

Jacques Swanepoel and Johannes Coetzer

An Interactive Tool for Forensic Handwriting Examination

Antonio Parziale, Adolfo Santoro, Angelo Marcelli, Anna Paola Rizzo, Cristiano Molinari, Andrea Giuseppe Cappuzzo and Fabio Fontana

Improving Isolated Digit Recognition using a Combination of Multiple Features

Abdeljalil Gattal, Youcef Chibani, Chawki Djeddi and Imran Siddiqi

Segmentation of Touching Component in Arabic Manuscripts

Nabil Aouadi, Afef Kacem and Abdel Belaid

A Machine Learning Approach to Detection of Core Region of Online Handwritten Bangla Word Samples

Sudarshan Baral, Soumik Bhattacharya, Anirban Chakraborty, Ujjwal Bhattacharya and Swapan Kr. Parui

Segmentation of Historical Handwritten Documents into Text Zones and Text Lines

Basilis Gatos, Georgios Louloudis and Nikolaos Stamatopoulos

Grouping Historical Postcards Using Query-by-Example Word Spotting

Gernot Fink, Leonard Rothacker and René Grzeszick

On the Influence of Key Point Encoding for Handwritten Word Spotting

David Fernández-Mota, Pau Riba, Alicia Fornés and Josep Lladfís

Generation of Enhanced Synthetic Off-line Signatures Based on Real On-line Data

Moises Diaz-Cabrera, Marta Gomez-Barrero, Aythami Morales, Miguel A. Ferrer and Javier Galbally

Page Segmentation for Historical Handwritten Document Images Using Color and Texture Features

Kai Chen, Hao Wei, Jean Hennebert, Rolf Ingold and Marcus Liwicki

Improvement of Context Dependent Modeling For Arabic Handwriting Recognition

Mahdi Hamdani, Patrick Doetsch and Hermann Ney

Mathematical symbol hypothesis recognition with rejection option

Frank Dennis Julca Aguilar, Nina Sumiko Tomita Hirata, Christian Viard-Gaudin, Harold Mouchère and Sofiane Medjkoune

Deep-Belief-Network based Rescoring Approach for Handwritten Word Recognition

Partha Pratim Roy, Youssef Chherawala and Mohamed Cheriet

A Feature Extraction Method for Cursive Character Recognition Using Higher-Order Singular Value Decomposition

Mohammad Reza Ameri, Medhi Haji, Andreas Fischer, Dominique Ponson and Tien D. Bui

Later Added Strokes or Text - Fraud Detection in Documents Written with Ballpoint Pens

Ricardo da Silva Barbosa, Rafael Dueire Lins, Edson da F. de Lira and Antonio Carlos A. Camara

Document binarization using topological clustering guided Laplacian Energy Segmentation

Kalyan Ram Ayyalasomayajula and Anders Brun

16.50-17.30 Discussion - Voting for ICFHR 2018

17:30-20.00 Social Event – Tour to Knossos Palace

21:00-23.30 Banquet

Thursday, 4 September 2014

09.00-10.40 Session 8: HMMs for Handwriting Recognition
Chair: Joan Andreu Sánchez

A reevaluation and benchmark of hidden Markov models

Jean-Paul van Oosten and Lambert Schomaker

Improvements in Sub-Character HMM Model Based Arabic Text Recognition

Irfan Ahmad, Gernot Fink and Sabri Mahmoud

Training of On-line Handwriting Text Recognizers with Synthetic Text Generated Using the Kinematic Theory of Rapid Human Movements

Daniel Martín-Albo, Réjean Plamondon and Enrique Vidal

Towards Unsupervised Learning for Handwriting Recognition

Michał Kozielski, Malte Nuhn, Patrick Doetsch and Hermann Ney

Progress in the Raytheon BBN Arabic Offline Handwriting Recognition System

Huaigu Cao, Prem Natarajan, Xujun Peng, Krishna Subramanian, David Belanger and Nan Li

10.00-11.40 Session 9: Applications II
Chair: Umapada Pal

Recognition System for On-line Sketched Diagrams

Martin Bresler, Truyen Van Phan, Daniel Průša, Masaki Nakagawa and Václav Hlaváè

Rejecting both segmentation and classification errors in handwritten form processing

Claudio De Stefano, Francesco Fontanella, Angelo Marcelli, Antonio Parziale and Alessandra Scotto di Freca

Are Sparse Representation and Dictionary Learning Good for Handwritten Character Recognition?

Chi Nhan Duong, Kha Gia Quach and Tien D. Bui

11.40-12.00 Coffee break

12.00-13.20 Session 10: Writer Identification
Chair: Thierry Paquet

Combining Local Features For Offline Writer Identification

Rajiv Jain and David Doermann

Writer Identification Using a Statistical And Model Based Approach

Diamantatos Paraskevas, Gritzalis Stefanos and Kavallieratou Ergina

Writer Identification in Music Score Documents without Staff-Line Removal

Anirban Jyoti Hati, Partha Pratim Roy and Umapada Pal

Development of Handwriting Individuality: An Information-Theoretic Study

Sargur Srihari, Zhen Xu and Lisa Hanson

13.20-14.30 Lunch

14.30-15.30 Poster Session 3
Local Co-occurrence and Contrast Mapping for Document Image Binarization
Nikolaos Mitianoudis and Nikolaos Papamarkos

Binarization of Degraded Document Images Based on Combination of Contrast Images
Alisson Arruda and Carlos Mello

Automatic Signature Stability Analysis And Verification Using Local Features
Muhammad Imran Malik, Marcus Liwicki, Andreas Dengel, Seiichi Uchida and Volkmar Frinken

Automatic Detection of Handwritten Texts from Video Frames of Lectures
Purnendu Banerjee, Ujjwal Bhattacharya and Bidyut B. Chaudhuri

Handwriting Normalization by Zone Estimation using HMM/ANNs
Joan Pastor-Pellicer, Salvador España-Boquera, Francisco Zamora-Martínez and María José Castro-Bleda

Recent Advances in Offline Signature Identification
Donato Impedovo, Giuseppe Pirlo and Michele Russo

An Approach of Strike-through Text Identification from Handwritten Documents
Chandranath Adak and Bidyut B. Chaudhuri

Binarization: a Tool for Text Localization
Paraskevas Diamantatos, Ergina Kavallieratou and Pilar Gomez-Gil

An Active Contour Based Method for Image Binarization : Application to degraded historical document images
Hadjadj Zineb, Maziane Abdelkrim, Cheriet Mohamed and Cherfa Yazid

A Novel Approach of Bangla Handwritten Text Recognition using HMM
Partha Pratim Roy, Prasenjit Dey, Sangheeta Roy, Umapada Pal and Fumitaka Kimura

Automatic Line Segmentation and Ground-Truth Alignment of Handwritten Documents
Théodore Bluche, Bastien Moysset and Christopher Kermorvan

Arabic font recognition based on a texture analysis
Kallel Faten Jaïem, Slim Kanoun and Véronique Églin

Towards Arabic Handwritten Word Recognition via Probabilistic Graphical Models
Akram Khémiri, Afef Kacem and Abdel Belaïd

Comparison of MRF and CRF for Text/Non-text Classification in Japanese Ink Documents
Soichiro Inatani, Truyen Van Phan and Masaki Nakagawa

Semiautomatic Text Baseline Detection in Large Historical Handwritten Documents
Vicente Bosch Campos, Alejandro Héctor Toselli and Enrique Vidal

A Sparse Coding based Approach for the Resolution Enhancement and Restoration of Printed and Handwritten Textual Images
Rim Walha, Fadoua Drira, Frank Lebourgeois, Christophe Garcia and Ad el M. Alimi

Gabor Filters for Degraded Document Image Binarization
Abdenour Sehad, Youcef Chibani and Mohamed Cheriet

A New Text-Independent GMM Writer Identification System Applied to Arabic Handwriting
Fouad Slimane and Volker Märgner

A Noisy-Or Discriminative Restricted Boltzmann Machine for Recognizing Handwriting Style Development
Gang Chen and Sargur Srihari

User Interaction Optimization for an Evolving Classifier of Handwritten Gesture Commands
Manuel Bouillon, Eric Anquetil, PeiYu Li and Grégoire Richard

Seam Carving for Text Line Extraction on Color and Grayscale Historical Manuscripts
Nikolaos Arvanitopoulos and Sabine Süsstrunk

Scribal Attribution using a Novel 3-D Quill-Curvature Feature Histogram
Fredrik Wahlberg, Lasse Mårtensson and Anders Brun

Online Signature Verification based on Kolmogorov-Smirnov Distribution Distance
Erika Griechisch, Muhammad Imran Malik and Marcus Liwicki

Document Writer Analysis with Rejection for Historical Arabic Manuscripts
Daniel Fecker, Abedelkadir Asi, Werner Pantke, Volker Märgner, Jihad El - Sana and Tim Fingscheidt

Graph Based Re-Ranking Method with Application to Handwritten Digits
Foteini Fotopoulou and George Economou

Multiple Training - One Test methodology for Handwritten Word-Script Identification
Miguel A. Ferrer, Aythami Morales, Nayara Rodríguez and Umapada Pal

An application of LBF energy in image/video frame Text Detection
V.N Manjunath Aradhya and M. S Pavithra

Ground-truth and Metric for the Evaluation of Arabic Handwritten Character Segmentation
Yousef Elarian, Abdelmalek Zidouri and Wasfi Al-Khatib

Recognizing Glagolitic Characters in Degraded Historical Documents
Sajid Saleem, Fabian Hollaus, Markus Diem and Robert Sablatnig

15.30-15.50 **Coffee Break**

15.50-17.00 **Competitions**

ICFHR 2014 Competition on Handwritten Digit String Recognition in Challenging Datasets (HDSRC 2014)

Markus Diem, Stefan Fiel, Florian Kleber, Robert Sablatnig, Jose M. Saavedra, David Contreras, Juan Manuel Barrios and Luiz S. Oliveira

ICFHR2014 Competition on Handwritten Text Recognition on tranScriptorium Datasets (HTRtS)

Verónica Romero, Alejandro H. Toselli and Enrique Vidal

ICFHR 2014 Competition on Recognition of On-line Handwritten Mathematical Expressions (CROHME 2014)

Harold Mouchère, Chirstian Viard-Gaudin, Richard Zanibbi and Uptal Garain

ICFHR2014 Competition on Arabic Writer Identification Using AHTID/MW and KHATT Databases

Fouad Slimane, Sameh Awaida, Anis Mezghani, Mohammad Tanvir Parvez, Slim Kanoun, Sabri A. Mahmoud and Volker Märgner

ICFHR2014 Competition on Word Recognition from Historical Documents

Jackson Reese, Michael Murdock, Shawn Reid and Blaine Hamilton

ICFHR2014 Competition on Handwritten Document Image Binarization (H-DIBCO 2014)

Konstantinos Ntirogiannis, Basilis Gatos and Ioannis Pratikakis

ICFHR 2014 Competition on Handwritten KeyWord Spotting (H-KWS 2014)

Ioannis Pratikakis, Konstantinos Zagoris, Basilis Gatos, Georgios Louloudis and Nikolaos Stamatopoulos

17.00-17.40 **Panel Session**

17.40-18.40 **Awards**

18.40-19.00 **Closure**

Notes

A series of horizontal dotted lines for writing notes, set against a background of a fountain pen nib and a document with handwritten text.



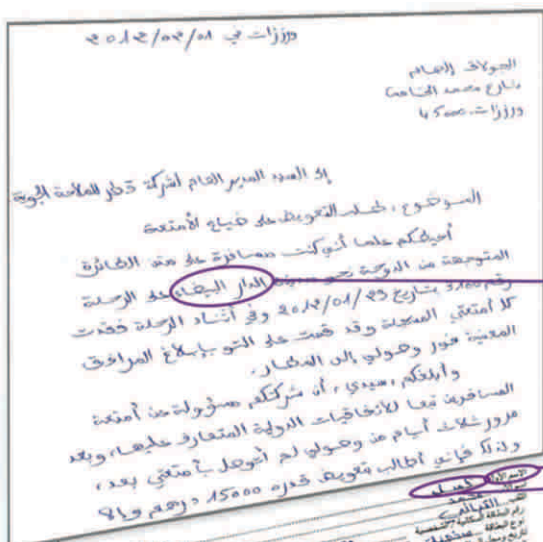
Image Analysis, Clean-Up & Data Recognition, On the Device *Without Wi-Fi or a Data Connection*

*Checks, IDs, Forms & Documents
From mRDC to mBoarding*



Cursive & Printed Arabic Character Recognition

Access the most information from all documents.



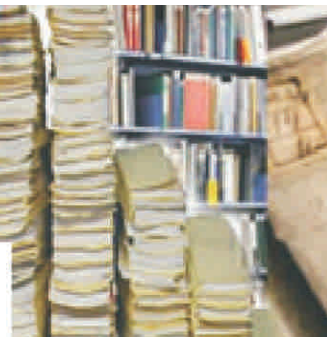
Checks, Administrative forms, Customer correspondences, Contracts, ID Documents, Proof-of-Residencies, Credit cards...

الدار البيضاء

الاسم الأول كميل

ستة وعشرون ألف وسبعمائة وستة

فاتوره رقم 0559



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Ψηφιοποίηση αρχειακού υλικού / Ηλεκτρονική Διαχείριση Εγγράφων

Digitization of documents and archives / Document Management

Προμήθεια Συστημάτων ψηφιοποίησης - Λογισμικό διαχείρισης εγγράφων - Ροών εργασίας - Περιεχομένου

Supply of specialized scanning and microfilming equipment - Document Management software - Workflow

Indexing- DataEntry- Καταλογογράφηση- Διαχείριση περιεχομένου

Indexing- DataEntry- Cataloguing- Content management

Αρχειοθέτηση και Διαχείριση Φυσικού Αρχείου

Physical Archives Storage & Management Services

Συμβουλευτικές Υπηρεσίες για θέματα Αρχείου

Document Management Consulting Services

Μικροφωτογράφηση αρχειακού υλικού

Archival Microfilming

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ΠΛΗΡΟΦΟΡΙΚΗΣ**

ΕΞΟΠΛΙΣΜΟΣ ΚΑΙ ΛΟΓΙΣΜΙΚΟ

ΥΠΗΡΕΣΙΕΣ ΨΗΦΙΟΠΟΙΗΣΗΣ

ΚΑΙ

ΔΙΑΧΕΙΡΙΣΗΣ ΠΕΡΙΕΧΟΜΕΝΟΥ

ΔΙΕΥΘΥΝΣΗ: ΕΥΡΥΔΑΜΑΝΤΟΣ 53, Τ.Κ 11745, ΑΘΗΝΑ
ΤΗΛΕΦΩΝΙΚΟ ΚΕΝΤΡΟ: 210-9370265



Handwriting Recognition and Digital Ink

MyScript technology enables people to “write” digitally (using a finger, a stylus, or another input device) and do remarkable things with that writing. Beyond merely recording this “digital ink,” MyScript converts it to meaningful information—text, shapes, mathematical expressions, or musical notation—enabling users work with their writing as easily as if it were in a standard word processor and to save, search, edit, share, and build on what they have created.

MyScript Labs

MyScript Labs is dedicated to a mission that serves as the focus and goal for all of our activities:

- Advance handwriting recognition and digital ink management technology to enable truly natural human-machine interfaces (HMI)
- Provide the best handwriting recognition system for the largest scope of languages (currently 64 languages supported in cursive script and 97 in isolated character mode)
- Develop next-generation capabilities that expand what is possible with digital writing

MyScript Labs at a Glance

- Most advanced and pioneering handwriting recognition research center in the world
- 15 years of experience in advancing handwriting recognition technologies
- Diverse, international team composed of Ph.D. level researchers and engineers with global language and cultural expertise
- Unmatched, highly specialized expertise in artificial Intelligence, pattern classification (neural networks), machine learning, and natural language processing (statistical language models)



MyScript Wall of Fame

ICDAR 2013

#1 in the 'Cursive Chinese'
#1 in the 'CROHME' competition
for mathematical excellence.

ICFHR 2012

#1 in Mathematical Expressions.

ICDAR 2011

#1 in the 'Online Chinese' and
'Online Arabic' competitions

ICDAR 2009

#1 in the 'Online Arabic' competition.

IWFHR 2006

#1 in Online Tamil Handwritten
Character Recognition Competition.

MyScript is the world leader in handwriting recognition with solutions that recognize text in over 64 languages, complex mathematical equations, geometric shapes and music notation. MyScript solutions are available on all leading desktop and mobile operating systems. MyScript serves customers worldwide from its headquarters in Nantes, France, and regional offices located in China, Japan, Korea, the U.S., and beyond.

To learn more, visit www.myscript.com or contact your regional MyScript office.

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