Bulletin of the International Graphonomics Society

BIGS

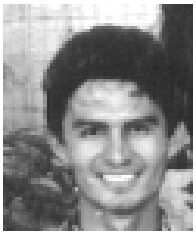
Volume 13, Nr. 2

October 1999

Aims of the International Graphonomics Society (IGS)

During the second international graphonomics conference in 1985, the decision was made to establish the International Graphonomics Society (IGS). The general aims of the IGS are the advancement of research in the field of graphonomics. These aims include an exchange of views and expertise, joint-project research, and the dissemination and application of knowledge wherever appropriate. Some means to achieve these goals are: the organization of conferences and workshops and the publication of their proceedings, the stimulation of communication and research contacts by any other means, the transmission of information through a regular bulletin (BIGS), an electronic list (Scrib-L) and the maintenance of a graphonomics research directory. The IGS has the status of a legal non-profit organization. It was established as a foundation ('stichting') under the law of the Netherlands on January 30th, 1987.

BIGS: Bulletin of the IGS (ISSN 1560-3253) is published biannually, in April and in November by the International Graphonomics Society, Department of Experimental Psychology University of Nijmegen P.O. Box 9104, 6500 HE Nijmegen, The Netherlands (+31.24.361.2632 /26 33). It contains information relevant to the Society including book reviews, research papers, and conference calls. Responsibility for the contents rests upon the authors and not upon the Society, or its members. BIGS is distributed among IGS Members. Printed in the Netherlands.



From the Editors

This is the 26th Bulletin of the International Graphonomics Society, BIGS 13, 2. This is also our first column as the new Editors of BIGS, for which we will have the privilege of serving for the period 2000-2005. We would like to join the Society in expressing our gratitude to Professors Réjean Plamondon and Ruud Meulenbroek for their outstanding work as past Editors of BIGS. We have big plans for BIGS in the new millenium. First, many opportunities exist to serve the Bulletin, formally and informally. Readers are invited to submit letters, regular or occasional columns, book reviews, or news. Consider submitting brief tutorial papers or research notes. Electronic searches in databases will be facilitated by the ISSN 1560-3253 code for BIGS. This will also enhance the visibility of the IGS and its members. For more information, please email us at pepeum@wam.umd.edu or asgleedham@ntu.edu.sg . Second, we would like to speed-up the process of publishing BIGS in the near future by using electronic publishing. In fact, BIGS 12 (Issues 1 & 2) and BIGS 13, 1 are already available through the BIGS archive on Internet as pdf files with previous issues stored in ZIP format (http://www.socsci.kun.nl/psy/igs/). We would like your comments and criticisms on this possibility.

This issue of BIGS contains a tutorial paper on the study of kinematics of graphic tasks in forensic analysis by Dr. Arend Van Gemmert. Next, a list of publications following the Eight IGS Conference are described. Prof. Thomassen, in his usual book review contribution, examines Florian Coulmas' Blackwell encyclopedia of writing systems. In addition, a list of new IGS members (+40) as well as recent publications relevant to IGS membership are compiled in this issue. BIGS is completed with an update of the Conference Agenda, workshops and other special events.

Finally, you will likely receive BIGS 13,2 in February rather than November. Due to renewal of the IGS board and the changing of BIGS editors, it was not possible to mail you BIGS 13,2 earlier. We will return to the previous publishing times (April and in November) in future issues.

José L. Contreras-Vidal
Graham Leedham

Message from the President

Montreal, December 13, 1999.

Dear Fellow members,

I am pleased to inform you that three members have accepted to join the board of our Society: Professor Angelo Marcelli, Jose L. Contreras-Vidal and Venu Govindaraju to replace Claudie Faure, Franco Massuli and Norbert Mai. I take this opportunity to thank Claude, Franco and Norbert for their commitment to our Society and for their active participation to the board and its project.

I am also delighted to inform you that professors Graham Leedham, Ruud Meulenbroek and Peter Baier have accepted to serve on the board for a second term and Marvin Simner for a fourth term. Moreover, Prof. Arnold Thomassen will continue in the IGS Board until November 1st, 2000 as Past President of IGS.

I have also taken this opportunity to reorganize the board to redistribute some tasks that where previously under the responsibility of the secretary. I am pleased to announce that Ruud Meulenbroek will act as the board secretary and treasurer and will take charge of the membership administration and the finances of the Society.

The editing of BIGS will be under the responsibility of two coeditors: Graham Leedham and Jose L. Contreras-Vidal. Professor Marcelli will take charge of the IGS information package to make it available to our member upon request. Professor Venu Govindaraju will be in charge of the production and update of the publicity flyer and of the production of the society Webpage (in collaboration with Professor Graham Leedham and Jose Contreras-Vidal).

I wish a good luck to all of them and a happy new millenium to all of us!

Réjean Plamondon
President of IGS

New IGS Board for 2000-2005

Réjean Plamondon	President	(1997-2002)	(2nd term)
Ruud Meulenbroek	Secretary, Treasurer	(2000-2005)	(2nd term)
Marvin Simner	Member	(2000-2003)	(4th term)
Angelo Marcelli	Information Office	(2000-2003)	(1st term)
Peter Baier	Member	(2000-2005)	(2nd term)
Jose L. Contreras-Vidal	BIGS, Co-editor	(2000-2005)	(1st term)
Graham Leedham	BIGS, Co-editor	(2000-2005)	(2nd term)

Report on IGS99 - Singapore

For the three days 28-30 June 1999 a dedicated group of 57 delegates met at the York Hotel in Singapore for the Ninth Biennial Conference of the International Graphonomics Society. It was a truly international conference with delegates coming from 14 countries to participate - Australia, Belgium, Canada, China, France, Germany, Hong Kong China, India, Italy, Japan, Singapore, The Netherlands, United Kingdom and the USA. In fact most of the attendees (some 48 of the 57, or 84%) were from overseas. We were very pleased to welcome many familiar faces who have contributed to the conference in most (and in some cases all) of its previous eight incarnations around the world. We were additionally delighted to welcome many new faces contributing to this conference.

The theme of the conference was Written Oriental Languages to reflect the multi-lingual nature of the region but included papers on all aspects of handwriting and drawing relevant to the IGS. The conference was organised as a single track event with ten sessions spread over the three days. Each paper was allocated 20 minutes for presentation and questions and there were between 4 and 6 papers presented per session.

The conference was sponsored by the Association of Forensic Document Examiners, the International Association of Pattern Recognition and the Chinese Language-Cognitive Science Joint Research Centres, the Hong Kong University and the Chinese Academy of Sciences.

Arnold Thomassen presents the first paper

The opening session set the scene for the conference with three keynote papers that covered the breadth of the conference topics – motor control, computer recognition and forensic science. Arnold Thomassen presented the first paper - "*Facilitation of writing by the non-dominant hand under bimodal conditions – Arnold J W M Thomassen, Ruud G J Meulenbroek and Chris F Bouwhuisen*" followed by a presentation from Rejean Plamondon describing an experiment to assess the ability to enter a forged signature in an automatic on-line signature verification system - *"Automatic signature verification: a report on a large-scale public experiment - Rejean Plamondon, Wacef Guerfali and Marc Lalonde*". Patricia Fisher presented the third keynote paper with some observations on the

effects of parkinsonism and hepatic encephalopathy on the sufferers signature and its consistency - *"Signatures of persons with parkinsonism and hepatic encephalopathy as comparison standards" - Carl E Anderson and M Patricia Fisher*.

The subsequent nine sessions over the three days contained 54 further papers covering the topics of Motor Control (6 papers); Forensic Analysis (9 papers); Written Oriental Languages (13 papers); Handwriting Recognition (6 papers); Computer Processing of Handwriting (5 papers); Development and Education (9 papers) and Handwriting Disorders (6 papers).

On the Tuesday morning we were fortunate to have a very interesting special workshop containing 6 presentations on *"Brush Graphonomic Writing and Applications"*, organised by Henry Kao of the University of Hong Kong. The workshop overviewed the history of Chinese calligraphy and his experiments and observations of its therapeutic effects in various illnesses.

A notable feature of the IGS conferences, which sets them apart from many other conferences, is the multi-disciplinary nature of the event and consequent mixing and discussion between participants from many different professions and backgrounds. The common ground is a professional interest in graphonomics. These discussions often provide new insights into a problem or opens up new avenues of collaboration, which subsequently leads to improved impact of research and understanding. It is often the case that all IGS delegates are also presenting a paper resulting in the conference becoming similar to a workshop in nature. We were very pleased to note that this feature was again evident at IGS99.

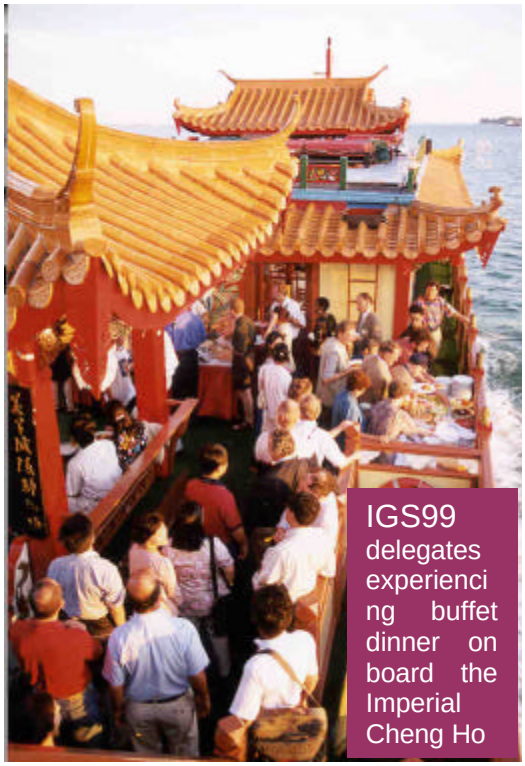
The 57 papers presented at the conference were published in a 305 page bound proceedings available at the conference. This is *"Proceedings of the 9th Biennial Conference of the International Graphonomcs Socity, edited by Graham Leedham, Maylor Leung, Vijay Sagar and Xiao Xuhong, ISBN 90-803739-2-3, Nanyang Technological University, 1999".* Different from previous IGS conferences, authors were requested to submit full papers of up to six pages in length for inclusion in the proceedings rather than short abstracts. This was in order to have a conference proceeding available at the conference that represented a full record of the conference in its own right. It also satisfies the increasingly common requirement in university engineering and science disciplines that recognition of the authors' conference

contribution and financial support to attend the conference will only be granted if the paper presented has been peer reviewed on the full paper by a high standing international programme committee and are published in a proceedings which has an ISBN number.

Delegates at the conference

The proceedings were very popular and all spare copies were sold out at the conference. However, if any members wish to purchase a copy please send email to asgleedham@ntu.edu.sg. If there is sufficient demand it may be possible to reprint a few more copies.

The conference was not all technical sessions and discussions. On the first evening of the conference the delegates visited the Night Safari, which provided a novel opportunity to explore the dark jungle paths of an open Zoo at night without knowing what was around the next dark corner. Fun was had by all, and fortunately, no one got lost. On the second evening everyone relaxed during a two-and-a-half hour dinner cruise around the harbour and islands between Singapore and Indonesia. This cruise was on board the Imperial Cheng Do, which is an exact replica of a famous Imperial vessel of the Ming Dynasty.



IGS99 delegates experiencing buffet dinner on board the Imperial Cheng Ho

Following the conference two post-conference publications are in preparation. One is a special issue of Pattern Recognition journal, editied by Rejean Plamondon, Graham Leedham and Wacef Guerfali, based on papers concerned with computer processing and pattern recognition. A number of revised and extended papers have been submitted and are currently under review for this special issue. It is anticipated that selected papers will appear in an issue to be published towards the end of 2000. In addition a

special issue of the Journal of Forensic Document Examination, edited by Marvin Simner, is also in preparation based on selected papers concerned with forensic document examination and is expected to be published in late 2000 or early 2001. Further details of these publications will be published in a later issue of BIGS. We look forward to seeing you all again next year at IGS 2001.

IGS Feature

The Study of Kinematics of Graphic Tasks: A Forensic Perspective*. Arend W. A. Van Gemmert, Motor Control Laboratory, Department of Exercise Science and Physical Education, Arizona State University, P.O. Box 870404, Tempe, AZ 85287-0404, USA
E-mail: VanGemmert@asu.edu

Since the seventies, the use of handwriting and drawing movements to research fine motor control issues has increased rapidly. The use of these graphic tasks boomed especially as result of technological progress made in the manufacturing of relatively inexpensive digitizers which sample spatial coordinates with a temporal frequency of 50 Hz and higher. The interest in graphic tasks, like handwriting, as an instrument to increase our knowledge about human movement performance lies also in the fact that handwriting is a complex overlearned motor skill in which biomechanical and cognitive processes contribute to the spatial form and the kinematic features of the handwritten product.

Current techniques to capture the spatial and kinematic features of graphic tasks are not much different from the seventies, although increasing technological progress increased temporal and spatial accuracy, and even made some new variables available. Most common setups are using a pen stylus with digitizer attached to a computer with special developed software or some of the available collection software programs. Signals are usually collected from the digitizer at a frequency of 100 up to 200 Hz. The collected signals for every sample are the X- and Y-position of the pen on and above the digitizers, pressure along the axis of the pen, the angle of the pen along its axis, the identification which pen is used (this latter feature gives the possibility to do bimanual experiments on one digitizer with two pens), and with some pens the button switch. The derived measures from the X- and Y position of the pen (cf. Thomassen & Van Galen, 1996; Teulings, 1996) are reaction time (the length of the delay before the onset of writing following the instruction to start, also called movement initiation time), movement time (the duration of the actual writing trajectory), various velocity measures (mean velocity, absolute velocity, and maximum velocity, each in either the X-, or Y-direction or the tangential product), dysfluencies (number of velocity peaks per stroke, centimeter, or second), various acceleration measures (mean acceleration, absolute acceleration, and maximum acceleration, each in either the X-, or Y-direction or the tangential product), jerk (number of accelerations per unit of time, sometimes normalized for stroke length and duration), pause time (between strokes, characters, words, and sentences), and the distribution of energy in the power spectrum of the velocity profile. To understand the meaning of these variables, it is most helpful to follow the process of writing down an intended sentence.

In a model of handwriting (Van Galen, 1991; cf. Schomaker & Van Galen, 1996), nine different processing stages are distinguished to generate an intended sentence. Firstly, an idea is formed how to complete an intention (Activation of intentions) followed by expressing the concepts (Semantic

retrieval) which are the stones to build a sentence (Syntactic construction). After these more abstract stages words are selected bound by the syntactic construction (Lexical retrieval). In the next stage letters are selected bound by spelling rules (Selection of Grapheme). The shapes of letters are chosen in the Allograph selection stage, before the slant, size, and position of the stroke are determined in the following stage (Task-space geometry). Thereafter, the end-effectors are recruited (Joint-space geometry). And finally, the muscles are tuned to adjust for force, friction, posture, and reflex gain (Muscular adjustment).

In this model processing is serial and parallel, since input from a higher module can be processed by a lower module before completion of the process. Therefore, two temporal features can be derived from this model. Firstly, the advance preparation of a longer or more complex writing sequence leads to longer movement initiation times (reaction times), or pause times, and secondly the on-line preparation of further elements in the sequence leads to a local slowing-down of the pen displacement, i.e., increased movement times and/or pause times. The location of temporal delay is determined by the level of the involved processing module. Moreover, if a word has a very complex spelling the stroke executed during the processing of this complex word in the grapheme selection module will be slower than the same stroke executed during the processing of a simple word in this module. So, the location of a slowed stroke will be earlier in a sentence when the involved module is at a higher level. Other constraints not specifically bound by this model, but of essential importance to understand handwriting production is the fact that the smallest unit of handwriting is a character seen from a literal point of view. However, it is arguable that from a motor control perspective a single stroke is the smallest unit, because normal executed strokes are generated by a single coordinated agonist-antagonist activation, resulting in a single peaked bell-shaped velocity profile. These strokes are usually defined as a writing segment bounded by inversions in its vertical velocity. The duration of a stroke tends to be independent of its size which is known as the isochrony principle (Thomassen & Teulings, 1985; Viviani & Terzuolo, 1980). However, tangential velocity of the pen along a curved trajectory is directly proportional to the local radius of the curve, which is known as the 2/3 power law (Lacquaniti, Terzuolo, & Viviani, 1983). Therefore, local pen speed is much higher in parts of the trajectory with only shallow curves than in parts with tight curves.

Individual cursive letters of the Latin alphabet are composed of two to six of such strokes which can be divided into up- and down-strokes. Characters within a word are connected by up-strokes and the typical duration of a stroke is between 150 and 200 ms in young adults, which makes the production of a stroke pair a cyclical event with a preferred cycle frequency of about 5 Hz (Teulings & Maarse, 1984). Therefore, on average 4-7 strokes or 2 letters are produced per second in spontaneous script by an experienced adult writer. As result of some of the former mentioned determinations and some individual constraints on handwriting production, the average of 2 letters produced per second depends on age, development, disease, practice, skill, text complexity, spelling difficulty, letter shape, and stroke sequence.

The interesting question is, of course, how these predictions can be incorporated into the forensic practice. For example, the axiom that

handwriting is an overlearned skill predicts that if one wants to disguise his/her handwriting or wants to forge somebody else's handwriting, one has to inhibit automated processes, like task-space geometry and allographic selection. Therefore, instead of the primarily open-loop process, the production of the unfamiliar handwriting can be characterized primarily by a closed-loop process (Van Galen & Van Gemmert, 1996). Furthermore, in contrast to forged or disguised handwriting, on-line visual control is primarily used in normal handwriting for placement of letters and words along the paper lineation, and with spelling, syntax, and semantics. An additional complication for a forger is that he/she has to comply to its model which is produced with a different set of psychomotor skills and biomechanical constraints of the pen-limb system. These differences between normal script and the production of unfamiliar script leads to longer movement initiation times, longer movement times, and longer total pause durations. Two explorative studies (Van Gemmert & Van Galen, 1996; Van Gemmert, Van Galen, Hardy, & Thomassen, 1996) were conducted to verify these prediction about disguised handwriting and mimicked handwriting (forged handwriting is handwriting with criminal intend, therefore the handwriting in the latter study was called mimicked handwriting). Although these two studies were quite successful in their attempt to verify predictions on disguised and mimicked handwriting from a psychomotor view the results of those studies should be estimated with great prudence as to their applicability to the forensic practice. Firstly, these experiments gained statistical power by asking for replications, which is usually not possible in the forensic practice. The differences tested are between groups for the mimicked writing samples and although statistical significance was reached, temporal features of single cases of individuals can still be mis-classified as coming from somebody who is mimicking or stemming from somebody who is using his/her own writing. To classify disguised and normal handwriting in the temporal domain is even more difficult, since the disguised handwriting samples in the experiments were compared to the normal handwriting of the same writer. Another concern is that aging, medication, stress, and situational constraints do also affect temporal and spatial features of handwriting. A final consideration is that the forensic practice usually only deals with static samples, and with the present state of art, the findings of these explorative experiments are rather difficult to translate into effective methods for analysis of static handwriting samples.

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IGS News

Publications Following the Eigth IGS Conference

A special double issue of Acta Psychologica (1998, Vol. 100, no. 1/2, 236 pp, ISSN: 0001-6918), entitled *Neuromotor Control in Handwriting and Drawing*, edited by Gerard P van Galen and Pietro G. and published by Elsevier Science (Amsterdam) appeared recently. The following articles, based on papers presented at IGS '97 form the contents of the volume:

Opening article: 'Neuromotor control in handwriting and drawing: Introduction and overview' by the Editors: G. P. van Galen and P. G. Morasso.

Section 1: Neuromuscular and Biophysical Models: 'Geometric features of workspace and joint-space paths of 3D reaching movements' by M. Klein-Breteler, R. Meulenbroek and C.Gielen; 'Functional properties of graphic workspace: Assessment by means of a 3D geometric arm model' by J. Schillings, R. Meulenbroek and A. Thomassen; 'The stability of pen-joint and interjoint coordination in loop writing' by R. Meulenbroek, A. Thomassen, P. van Lieshout and S. Swinnen; 'Low-frequency periodicity in the coordination of progressive handwriting' by A. Thomassen and R. Meulenbroek; 'Can non-linear muscle dynamics explain the smoothness of handwriting movements?' By V. Sanguineti, F. Frisone, S. Bruni and P. Morasso; 'The 2/3 Power Law:

When and Why?' by R. Plamondon and W. Guerfali; 'Neuromuscular control model of the arm including feedback and feedforward components' by S. Stroeve;

Section 2: Learning and Cognitive Models: 'Axial pen force increases with processing demands in handwriting' by C. van den Heuvel, G. van Galen, H. Teulings and A. van Gemmert; 'On-line size control in handwriting demonstrates the continuous nature of motor programs' by G. van Galen and J. Weber; 'Differential effects of task complexity on contextual interference in a drawing task' by J-M. Albaret and B. Thon*;*

Section 3: Neuropsychological Issues: 'Elderly subjects are impaired in spatial coordination in fine motor control' by J. Contreras-Vidal, H. Teulings and G. E. Stelmach; 'Spatial features of angular drawing movements in Parkinson's disease patients' by A. Vinter and P. Gras; 'Handwriting and speech changes across the levodopa cycle in Parkinson's Disease' by P. Poluha, H. Teulings and R. Brookshire; 'The influence of mental and motor load on handwriting movements in Parkinsonian patients' by A. van Gemmert, H. Teulings and G. Stelmach.

Special Issue of Intelligent Automation and Soft Computing (IASC)

Selected papers from IGS'97 will appear in the special issue "Advances in Handwriting and Drawing Analysis" of IASC scheduled for Volume 7, Number 3 (Spring 2001). This special issue was co-edited by A.M. Colla, F. Masulli and R. Plamondon. The articles are: 'On-line character analysis and recognition with fuzzy neural networks' by G. Sanchez, Y.A. Dimitriadis, S.R. Mas, S. Garcia, C. Izquierdo and J. Lopez Coronado; 'Word recognition from sparse graph of letter candidates using wildcards and multiple experts' by A. Hennig, N. Sherkat, R.J. Whitrow; 'Dynamic adaptation to the writer' by A. Leroy; 'A shape-based algorithm for segmenting on-line handwriting' by C. De Stefano, A. Luliano and A. Marcelli; `Evaluation of signature quality as a function of nationality via off-line signature verification system' by I. Yoshimura and M. Yoshimura; and 'Detection of control points for warping map images' by G. Do-Tien, R. Plamondon, C. Zhu, Y. Li.

Journal of Forensic Document Examination

Finally, expanded versions of three papers presented at IGS '97 appeared in a mini-series section of volume 11 (Fall 1998) of the Journal of Forensic Document Examination. This mini-series entitled "Advances in Forensic Document Examination'' was co-edited by Marvin L. Simner and Patricia Girourard. The papers were: 'Intra-individual changes in handwriting features depending on handwriting velocity' by Petra Halder-Sinn and Karin Funsch; 'The automatic extraction of pseudodynamic information from static images of handwriting based on marked grayvalue segmentation' by Katrin Franke and Gerhard Grube; and 'The origin of class characteristics: An empirical investigation of a major principle in forensic document examination' by Marvin L. Simner.

Book Review

The graphic codes of language

by Arnold J.W.M. Thomassen

Review of Florian Coulmas (1996). The Blackwell encyclopedia of writing systems. Oxford: Blackwell Publishers. ISBN 0-631-19446-0. xxix + 603 pages. 70.- Pound Sterling.

Florian Coulmas is Professor of Sociolinguistics at Chuo University, Tokyo. He recently produced a learned and extensive account of the many options that the various cultures have selected and exploited to represent their language in an appropriate graphic code: The different writing systems. In this sturdy volume, the author makes his impressive knowledge and insight into language and writing systems accessible by arranging it into a straightforward alphabetical sequence, as an encyclopedia indeed. Coulmas is also the author of a monograph titled 'The writing systems of the world', and editor of 'The handbook of sociolinguistics'.

The encyclopedic articles are as highly legible as they are thorough and concise. They provide clear definitions and interesting explanations of technical and less technical terms and concepts. In many cases also a deeper theoretical account is given. Here the author displays an admirable degree of up-to-date sophistication where it comes to the interpretation of the written forms, orthographies and writing functions of language. His examples and abundant illustrations are concerned with over 400 different (major) languages and writing systems, as these developed throughout history all over the world, and as they are used today.

I choose the letter W as an example of the kind of topics that are dealt with. This choice was made purely because it is one of a small size: In spite of its association with 'writing' and 'word', the letter W has relatively few entries covering less than three percent of the entire volume. Here are these entries: W, w [letter name, form, and origin], Wade-Giles romanization [of Chinese script], wax tablets, Noah Webster (1758-1843), wenyan [classical literary Chinese], Winnebago syllabry [native American], Wolof alphabet [West-African], word, word blindness, word boundary, word play [pastime], word processing, word recognition, word representation, word separation [word boundary], word writing [logogram], word orthography, writ [written command], writer's cramp, writing, writing community, development of writing [in history], etymology of 'writing', writing surface, writing system, writing tools, written language, written norm [as different from the norm for spoken language].

As may be seen from these examples, the encyclopedia is multidisciplinary. It provides an exceptional account by a single author who appears to be justified in basing himself confidently on his broad expertise and his rich internalised knowledge base. As a sociolinguist, Coulmas is in my view not only well informed about sociology and linguistics, but also about

archeology, paleography, and anthropology, as well as about cognitive psychology and psycholinguistics. In his articles he also takes practical issues into account such as education, reading, spelling, and spelling reform; and likewise he discusses such subjects as the decipherment of unknown scripts.

Moreover, one finds more technical information on typefaces, printing, and the human production of handwriting, and observations on the directionality of letters and scripts, and more technical reflections on the consequences of literacy. Nearly every entry makes reference to several -often quite recent- publications for further reading. These publications are adopted in a multi-disciplinary bibliography containing some 650 titles.

Every time I opened this book to look up something of special interest, or just to browse, I was captured and pleasantly surprised to find another well-written entry on another intriguing topic. Repeatedly, I experienced that I had difficulty to stop myself from reading further, and to get 'back-to-work', like returning to writing this review. I regard this as a very convincing recommendation to anyone interested in the large variety of written forms of language.

The Tenth IGS Conference

IGS 2001 will be held in Summer 2001 at the University of Nijmegen, The Netherlands; Chair: Ruud Meulenbroek. The special theme for this Conference will be Motor Disorders. Further announcements concerning IGS 2001 will be made in the next BIGS issue and will also be made accessible on the IGS-2001 Web page which is currently in preparation. Visit the IGS homepage for updated information at http://www.socsci.kun.nl/psy/igs

IGS Membership Dues

The IGS office kindly reminds IGS members who have not already done so, to effectuate their membership dues for the current and next year (1999/2000) by following the instructions specified on the payment slip enclosed in this BIGS mailing. Membership entitles you to reduced rates for publications and conferences sponsored by IGS.

Results from Search for Information on the Internet

Information which is relevant to IGS members and which can be accessed on World Wide Web Internet services is summarised in BIGS regularly. The aim is to provide IGS members who have access to WWW with addresses of interesting sites. IGS members who have no facilities to access WWW are updated through this summary. The present overview contains site addresses that resulted from a (broad) search for new information by using the keyword *handwriting.*

http://wwwdsp.ucd.ie/~stephenm/

This site describes processor architectures for online handwriting recognition from The Digital Signal Processing (DSP) research group at the University College Dublin. The site provides not only interesting information and relevant links to related sites but also indicates a vacancy for a researcher in this area (Oct, 1999). Contact: Stephen McInerney. E-mail: stephenm@faraday.ucd.ie; DSP/VLSI M. Eng. Researcher, Room 244, Tel: +353.1.706.1914; DSP Group, Department of Electronic Engineering, Fax: +353.1..283.0921; University College Dublin, Dublin 4, Ireland.

http://ais.iss.nus.sg/

This site provides information about The Asian Interactive Systems Group (AIS), a centre for the research, development and design of Asian language technologies that result in a new, Asian human-computer interaction paradigm. The AIS group is part of the Kent Ridge Digital Laboratories, which is located on the campus of the National University of Singapore. The AIS group consists of members from Singapore, Malaysia, the People's Republic of China, Japan, USA, and UK.

The group developed the Advanced Chinese Input Suite (ACIS), the world's first input system that enables users to enter Chinese in a way that is natural, intuitive and easy-to-use. Text can be created and edited directly in the document via speech or handwriting, without going through complicated keyboard input methods. ACIS integrates a microphone, a tablet and several software components into a comprehensive human interface solution for Chinese computing.

1999: The Year of Handwriting

The National Schoolmuseum in Rotterdam, The Netherlands, in collaboration with the Museum for the Book and the Scryption Museum (in The Hague and Tilburg, respectively, both also in The Netherlands), have announced 1999 as The Year of Handwriting. The reason for this announcement is the fact that nowadays less and less is being written by hand. Between March, 26th and October, 3rd, 1999, the National Schoolmuseum organized an exhibition on the History and the Future of Handwriting. The exhibition included displays on the development of writing instruments, alphabets, technologies, and educational schemes. Furthermore, a special curriculum for primary school children was developed.

During 1999, seven seminars were organized on subjects such as analphabetism, writing in different cultures, dyslexia, lateralization, writing posture, handwriting education, and the future of handwriting education. Information about the activities during the Year of Handwriting can be obtained by writing to the National Schoolmuseum, Nieuwemarkt 1-A, 3011 HP, Rotterdam, The Netherlands. Tel: +31.10.4045. 425; Fax: +31.10.2332.801.

Recent Publications

In this section of BIGS the bibliographical details of recent publications relevant to the IGS are reported. In addition to publications by IGS members that were reported to the IGS office, the results of searches in Medline are given that were directed at papers on handwriting and related graphic skills which were published during the six months prior to the distribution of BIGS. IGS members are invited to report the bibliographic details of their recent publications to the IGS office.

Contreras-Vidal JL, Van Den Heuvel CE, Teulings HL, Stelmach GE. (1999) Visuo-motor adaptation in smokeless tobacco users. *Journal of Nicotine and Tobacco Research,* 1 (3): 219-228.

Ibanez V, Sadato N, Karp B, Deiber MP, Hallett M (1999) Deficient activation of the motor cortical network in patients with writer's cramp. *Neurology* 53(1): 96-105.

Marquardt C, Gentz W, Mai N (1999) Visual control of automated handwriting movements. *Experimental Brain Research* 128(1/2): 224-228.

Mergl R, Tigges P, Schroter A, Moller HJ, Hegerl U (1999) Digitized analysis of handwriting and drawing movements in healthy subjects: methods, results and perspectives. *J Neurosci Methods* 90(2):157-169.

Plamandon R, Lopresti DP, Shomaker LRB, Srihari R (1998) Online handwriting recognition. In **Wiley Encyclopedia of Electrical and Electronics Engineering**, Vol. 15: 123-146, Wiley and Sons.

Plamondon R, Guerfali W (1998) The generation of handwriting with delta-lognormal synergies. *Biological Cybernetics* 78: 119-132.

Van Gemmert AWA, Teulings HL, Contreras-Vidal JL, Stelmach G E (1999). Parkinson's disease and the control of size and speed in handwriting. *Neuropsychologia*, 37, 685-694.

The new issue of **Mannheimer Hefte für Schriftvergleichung**, No. 1+2/99 recently appeared with contributions by Peter Frensel, Jürgen Holzapfel and Karlheinz Marx, Andreas Duwe, Bernhard Haas and Peter Frensel, and Peter Baier.

New IGS Members (1999-2000)

Dr. Suliman **Al-Hawamdeh**, School of Applied Science, Nanyang Technological University, Nanyang Avenue, Singapore 639798, Singapore, Tel.: 65 790 5065, Fax: 65 793 4528, E-mail: assuliman@ntu.edu.sg

Dr. Massimo **Ancona**, Dipartimento di Informatica e Science dell'Informatione, Universita di Genova, Via Dodecanese 35, 16146 Genova, Italy, Tel: 39 10 3536605, Fax: 39 10 3536699, E-mail: ancona@disi.unige.it

Mr. R.R. **Berkel,** Scryption, Spoorlaan 343A, 5038 CH Tilburg, The Netherlands. Tel.: +31.13.5800.821, Fax: +31.13.5800.818; E-mail: scryption@tref.nl

Mr. Chris F. **Bouwhuisen**, Nijmegen Institute for Cognition and Information, Katholieke Universteit Nijmegen, P.O. Box 9104, 6500 HE Nijmegen, The Netherlands, Tel.: 31 24 361 2629, Fax: 31 24 361 6066, E-mail: bouwhuisen@nici.kun.nl

Mr. Patrick **CHAN** Khue Hiang, School of Applied Science, Nanyang Technological University, Nanyang Avenue, Singapore 639798, Singapore, Tel.: 65 790 4838, Fax: 65 792 6559, E-mail: pchankh@hotmail.com

Dr. Jose L. **Contreras-Vidal,** Department of Kinesiology, University of Maryland, 2363 HHP Bldg., College Park, MD 20742-2611 USA, Tel.: (301) 405-2495, Fax: (301) 314-9167, Email: pepeum@wam.umd.edu, http://www.inform.umd.edu/KNES/faculty/pepeum/pepeum.htm

Mr. David **Dick**, School of Human Biosciences, Handwriting Analysis & Research Lab., La Trobe University, Bundoora, Victoria 3083, Australia, Tel.: 613 9479 5787, Fax: 613 9479 5784, E-mail: d.rogers@latrobe.edu.au

Dr. **GAO** Ding-guo, Dept. of Psychology, Chinese Language Cognitive Science Research Centre, University of Hong Kong, Pokfulam Road, Hong Kong, China, Tel.: 852 2857 8230, Fax: 852 2857 3518, E-mail: dgao@hkusua.hku.hk

Dr. **TAN** Eng Chong, School of Applied Science, Nanyang Technological University, Nanyang Avenue, Singapore 639798, Singapore, Tel.: 65 790 4609, Fax: 65 792 6559, E-mail: asectan@ntu.edu.sg

Dr. N.H. **Freeman**, Dept. of Experimental Psychology, University of Bristol, 8 Woodland Road, Bristo, BS8 1TN, United Kingdom, Tel.: 44 117 928 8563, Fax: 44 117 9288588, E-mail: n.freeman@bris.ac.uk

Ms. Elspeth H. **Froude**, School of Human Biosciences, Handwriting Analysis & Research Lab., La Trobe University, Bundoora, Victoria 3083, Australia, Tel.: 613 9479 5663, Fax: 613 9479 5737, E-mail: e.froude@latrobe.edu.au

A/Prof NG **Geok See**, School of Applied Science, Nanyang Technological University, BLK N4 #2A-32, Nanyang Avenue, Singapore 639798, Tel: 65 790 5043, Fax: 65 792 6559, E-mail: asgsng@ntu.edu.sg

Dr. Venu **Govindaraju**, CEDAR, State University of New York at Buffalo, UB Commons, 520 Lee Entrance, Suite 202, Amherst, NY 14228-2567, USA, Tel.: 716 645 6164x103, Fax: 716 645 6167, E-mail: govind@cedar.buffalo.edu

Mr. Ajay Kumar **Goyal**, Thapar Centre for Industrial Research & Development, Bhadson Road, PO Box 68, Patiala 147001, China, Tel.: 91 175 39 3530, Fax: 91 175 21 2002, E-mail: ajay@tcrdcpt.ren.nic.in

Mr. Vasilios **Grammatikopoulos**, MSc, Physical Education and Sport Science, Aristotelian Uni. of Thessaloniki, Alexandrias 60, 54645 Thessaloniki, Greece, Tel.: +30 31 832 886,, grava@phed.auth.gr, ed ep

Dr. Wacef **Guerfali**, Laboratoire Scribens, Ecole Polytechnique de Montreal, C.P. 6079 Succ. Centre-Ville, H3C 3A7, Montreal, PQ, Canada, Tel.: 514 340 4711/4675, Fax: 514 340 5122, E-mail: Guerfali@scribens.polymtl.ca

Dr. Allan **Harvey**, Electrical Engineering Dept., RMIT, GPO Box 2476V, Melbourne, Vic3001, Australia, Tel.: 613 9925 2007, Fax: 613 9925 2007, E-mail: harvey@rmit.edu.au

Dr. Manfred R. **Hecker**, Bundeskriminalamt/KT5, Federal Police/Interpol, D-65173 Wiesbaden, Germany, Tel.: 49 611 551 5400, Fax: 49 611 551 5427, E-mail: manfred.hecker@exchange.w.bka.bund400.de

Mr. B. **Heesbeen,** LCI Computer Group NV, P.O. Box 3409, 5203 DK Den Bosch, The Netherlands. Tel.: +31.73.6455.255, Fax: +31.73.6455.296. E-mail: Bheesbeen@nl.lcigroup.com

Ms. Mika **Isono**, Fuzoku Junior High, Kanazawa University, 8-32 Jyonan, 1 chome, Kanazawa-city, Ishikawa, Tel.: 81 076 231 4879, Fax: 81 076 231 4879

Dr. Kimiyasu **Kiyota**, Dept. of Information & Telecommunication Eng., Kumamoto National College of Technology, 2659-2 Suya, Nishigoshi, Kikuchi, Kumamoto 861-1102, Japan, Tel.: 81 96 242 6065, Fax: 81 96 242 4190, kkiyota@tc.knct.ac.jp

Mr. Tomohiro **Konda**, Yamatake Corporation, 2-5-6 Yamatominami, Yamato-shi Kanagawa-ken, 256-0016 Japan, E-mail: konda@nbc.Yamatake.co.jp

Prof. Klaus W. **Lange**, Institute of Psychology, University of Regensburg, 93040 Regensburg, Germany, Tel.: 49 941 943 3775, Fax: 49 941 943 4496, E-mail: klaus.lange@psychologie.uni-regensburg.de

Dr. G.S. **Lehal**, Dept. of Computer Science & Eng., Punjabi University, Patiala 147002, India, Tel.: 175 28 3502, Fax: 91 175 282881, E-mail: gslehal@mailcity.com

Mr. Mitchell G. **Longstaff**, Department of Psychology, University of New Castle, University Drive, Callaghan, NSW 2308, Australia, Tel.: 61 24 921 5958, Fax: 61 24 921 6980, E-mail: Mitchell@hiplab.newcastle.edu.au

Mr. K.K. **Kobayashi,** National Research Institute of Police Science – Questioned Document Section, 6, Sanban-cho, Chiyoda-ku, Tokyo 102-0075, Japan. el.: +81.3.3261.9986, Fax: +81.3.3221.1245; E-mail: koba@nrips.go.jp (Fields: ai cos fs sp).

Dr. Kazuaki **Maeda**, Dept. of Business Admin. & Information Science, Chubu University, 1200 Matsumoto, Kasugai, Aichi 487-8501, Japan, Tel.: 81 568 51 1111/2826, Fax: 81 568 52 1505, E-mail: kaz@solan.chubu.ac.jp

Prof. Angelo **Marcelli**, DIIIIE - Universita' di Salerno, Via Ponte Don Melillo 1, 1-84084 Fisciano (SA), Italy, Tel.: 39 89 96 4274, Fax: 39 89 96 4218, E-mail: marcelli@diiie.unisa.it

A/Prof. **LEONG** Peng Chor, School of Applied Science, Nanyang Technology University, N4#2c-88, Nanyang Avenue, Singapore 639798, Tel.: 65 790 5633, Fax: 65 792 6559, E-mail: aspcleong@ntu.edu.sg

Dr. Fuad **Rahman**, Electronic Engineering Laboratories, University of Kent, Cantebury, Kent, CT2 7NT, United Kingdom, Tel.: 44 1227 82 3701, Fax: 44 1227 45 6084, E-mail: A.F.R.Rahman@ukc.ac.uk

Prof. Jagath C. **Rajapakse**, School of Applied Science, Division of Computing Science, Nanyang Technological University, Nanyang Avenue, Singapore 639798, Singapore, Tel.: 65 790 5802, Fax: 65 792 6559, E-mail: asjagath@ntu.edu.sg

Dr. Celine **Remi**, Universite de Rouen, PSI-La3i, 76821 Mont-Saint-Aignan Cedex, France, Tel.: 33 235 14 6587, Fax: 33 235 14 6618, celine.remi@univ-rouen.fr

Dr. Douglas **Rogers**, School of Human Biosciences, Handwriting Analysis & Research Lab., La Trobe University, Bundoora, Victoria 3083, Australia, Tel.: 613 9479 5787, Fax: 613 9479 5784, E-mail: d.rogers@latrobe.edu.au

Dr. Vijay Kumar **Saga**r, School of Applied Science, Nanyang Technological University, BLK N4 #2A-36, Nanyang Avenue, Singapore 639798, Tel.: 65 790 4595, Fax: 65 792 6559, E-mail: asvksagar@ntu.edu.sg

Mr. S. de **Schrijver,** LCI Computer Group NV, P.O. Box 3409, 5203 DK Den Bosch, The Netherlands. Tel.: +31.73.6455.255, Fax: +31.73.6455.296. E-mail: StafaanDS@ad.com (Fields: en).

Mr. Spirangarat **Setlur**, M.S., State University of New York at Buffalo, 520 Cedar Lee Entrance ste 202, Amherst NY 14228, USA, Tel.: +1 716 645 6164 ext 107, Fax: +1 716 645 6176, E-mail: setlur@cedar.buffalo.edu (Fields: ai bp cos handwriting arias)

Prof. Antonio **Sicuro**, Institute of Newclogy, University of Torino, C. Peschiera 142-1, Torino, Italy, Tel.: 39 011 385 2251, Fax: 39 011 385 2251

Ms. Jodi **Sita**, School of Human Biosciences, Handwriting Analysis & Research Lab., La Trobe University, Bundoora, Victoria 3083, Australia, Tel.: 613 9479 5787, Fax: 613 9479 5784, E-mail: J.Sita@latrobe.edu.au

Dr. Sargur **Srihari**, CEDAR, State University of NY at Buffalo, UB Commons, 520 Lee, Entrance, Suite #202, Amherst NY 14228-2583, USA, Tel.: 716 645 6162, Fax: 716 645 6176, E-mail: srihari@cedar.buffalo.edu

Ms Grace Wan-Bec **Tam**, University of Hong Kong, Flat F, 10/F, Princess Terrace, 13 Man Fuk Road, Kowloon, Hong Kong, China, Tel.: 852 2713 7683, Fax: 852 2760 8805, E-mail: gtam@mailcity.com

Prof. Yuan Y. **Tang**, Faculty of Science, Dept. of Computer Science, Hong Kong Baptist Universtiy, Kowloon Tong, Hong Kong, China, Tel.: 852 2339 5973, Fax: 852 2339 7892, E-mail: yytang@comp.hkbu.edu.hk

Ms Mabel **YUM** Po Shan, Dept. of Psychology, Chinese Language Cognitive Science Research Centre, University of Hong Kong, Pokfulam Road, Hong Kong, China, Tel.: 852 2859 2383, Fax: 852 2858 3518, E-mail: psyum@hkucc.hku.hk

Prof. **FAN** Zuo-shu,, Beijing Huilongguan Hospital, De-Sheng-Men-Wai, Beijing 100096, China, Tel.: 62716028, Fax: 62716285

Recent Conferences

Conferences which have already been announced in a previous BIGS issue are summarised by means of a brief, marked (*) entry

*IWFHR '98: 6th International Workshop on Frontiers in Handwriting Recognition**

1-3 September, 1998. Conference recently held at KAIST in Teajon, Korea. Chair: J.H. Kim. Topics: handwriting recognition algorithms, pre-processing, linguistic post-processing, emerging techniques, segmentation techniques, handwriting acquisition, and innovative applications. Program Chair: Prof. Seong-Whan Lee, Department of Computer Science and Engineering, Anam-dong, Songbok-ku, Seoul 136-701, Korea. Tel/Fax: +82.2.920.2168, E-mail: *swlee@human. korea.ac.kr*. More information can be found on the Internet at*: http://ai.kaist.ac.kr/iwfhr98*

*GFS'97: 3rd Internationaler Kongreß der Gesellschaft für Forensische Schriftuntersuching (3rd International Conference of the German Society of Forensic Document Examination)**

10-13 September, 1998. This conference was held in Luzern, Switzerland, closely following IGS'97. A total 136 participants, representing 28 nationalities, were informed about recent developments in forensic science. The scientific programme was centered around four major conference themes: (1) Document examination, (2) Researching and securing documents, (3) Printed documents and typewriting, and (4) The dynamics of handwriting movements. For more information please contact: Dr. Peter E. Baier, Universität

Mannheim, Institut für Schrift- und Urkundenuntersuchung (ISU), D-68131 Mannheim, Germany. Web site of the GFS: members.aol.com/InfoGFS/

AAAI '98: Artificial Intelligence and Link Analysis

23-25 October, 1998. This three-day symposium, held in Orlando, Florida, U.S.A. focused on computer-based link analysis for forensic purposes. Contact: David Jensen, Computer Science Department, University of Massachusetts (co-chair; email: *jensen@cs.umass.edu*). More information can be found on Internet at: *eksl-www.cs.umass.edu/aila/*

Forthcoming Conferences

Conferences which have already been announced in a previous BIGS issue are summarised by means of a brief, marked (*) entry.

IWTS'99: International Wireless and Telecommunications Symposium*

17-21 May, 1999. IWTS'99 was held at the ITM Resort and Convention Centre, Shah Alam in Malaysia. Contributions:Transmission Technologies, Coding and Multiple Access Techniques, High Speed Networks, ATM and Optical Networks, Multimedia Networks and Systems, Information Technologies, Signal and Image Processing, Transportation Information and Control Systems, Advanced Telecommunications in Medicine, Telecommunication in Education. Please submit three copies of one-page abstract in English, with name, affiliation and mailing address of the author(s). Cover letter should include the complete mailing address, telephone, fax number and e-mail address, if available, of the corresponding author. Abstract due by December 15th 1998. Information at Faculty of Information Science and Technology (FTSM), National University of Malaysia (UKM), Bangi 43600, Selangor, Malaysia.

VI'99: Vision Interface*

18-21 May, 1999. Hotel Delta, Trois-Rivieres, Quebec, Canada. VI'99 is a unique event with two international research conferences (see next entry) that present the latest results in computer vision and quality control by artificial vision. Each conference offers three concurrent days of invited and submitted papers. For a single registration fee, participants can attend presentations in either conference, promoting the exchange of knowledge among these important disciplines. Time has been set aside for workshops and other events. The two conferences are sponsored by the Canadian Image Processing and Pattern Recognition Society (CIPPRS). VI is also sponsored

by the International Association for Pattern Recognition (IAPR). General Chair: Fathallah Nouboud, UQTR, Canada. Vision Interface'99 will have the theme: 'Computer Vision for Industrial Applications'. Contributions describing original and unpublished research results are solicited on this theme and in other areas of computer vision, image processing and pattern recognition. Topics of the conference include, but are not limited to, the following: 2D and 3D scene analysis; Active and real-time vision; Mathematical imaging; Document analysis; Texture analysis; Biomedical image analysis; Image compression and coding; Stereo and motion analysis; Content-based image retrieval; Video retrieval and indexing; Image database; Image segmentation; Neural networks; Object recognition; Document compression and coding; OCR and Handwriting recognition; Remote Sensing; Visual Inspection; Multimedia; Internet. For further information please contact: Marc Parizeau, Universite Laval, Laboratoire de vision et systemes numeriques, Departement de Genie Electrique et de Genie Informatique, Universite Laval, Ste-Foy (PQ), Canada, G1K 7P4. Web site: www.dmi.usherb.ca/conferences/VI-99/. Deadline for abstract sub-mission: 20th November 1998.

QCAV'99: Quality Control by Artificial Vision*

18-21 May, 1999. Hotel Delta, Trois-Rivieres, Quebec, Canada. Quality Control by Artificial Vision'99. Contributions describing original and unpublished research results are solicited on, but not limited to, the following themes: Defect detection and characterization; Classification; Control by infrared and near infrared thermography; 2D and 3D dimensional control; Aspect control; Real time control; Image sensors; Illumination modeling 2D and 3D image processing algorithms; Real-time image processing software development; Real-time implementation; Methods; Segmentation; Pattern recognition; Texture analysis; Wavelet transform; Genetic algorithm; Data fusion; Mathematical morphology; Stochastic modeling; 3D representation; Neural network. For further information please contact: Dr. S. Kohler, Laboratoire LE2I, IUT Le Creusot, 12, rue de la fonderie, 71200 Le Creusot, FRANCE, Phone: (+33) (-0) 385 73 10 96, Fax: (+33) (-0) 385 73 10 99, Email: s.kohler@iutlecreusot.u-bourgogne.fr. Web site: www.dmi. usherb.ca/conferences/QCAV-99/. Deadline for abstract submission: 20th November 1998.

IIA'99 and SOCO'99: Third International ICSC Symposia*

1-4 June, 1999. Third international symposium on Intelligent Industrial Automomation, IIA'99, and Soft Computing, SOCO'99 at the Palazzo Ducale di Genova, Italy. Announcements and Call for Papers have been mailed in May 1998. Further details on web sites: www.icsc.ab.ca/iia99.htm and www.icsc.ab.ca/soco99.htm. Information can also be obtained from: ICSC International Computer Science Conventions, P.O. Box 279 - Millet, AB T0C 1Z0 – Canada. Tel: +1.403.387.3546 (after January 25, 1999: +1.780.387. 3546); Fax: +1.403.387.4329 (after January 25, 1999: +1.780.387.4329); E-mail: operating@icsc. ab.ca; Website: www.icsc.ab.ca.

CIMA'99: International ICSC Congress on Computational Intelligence*

22-25 June, 1999. CIMA'99, International Congress on Computational Intelligence, will take place at the Rochester Institute of Technology, NY, USA. CIMA'99 will feature the following symposia: Fuzzy logic and applications (ISFL'99), Advances in Intelligent Data Analysis (AIDA'99), Soft Computing in Biomedicine (SCB'99), and Soft Computing in Financial Markets (SCFN'99). Announcements/Call for Papers have been mailed in June 1998. Please consult the following web site for details: www.icsc.ab.ca/cima99.htm. Further information can be obtained from: ICSC International Computer Science Conventions, P.O. Box 279 - Millet, AB T0C 1Z0 – Canada. Tel: +1.403.387. 3546 (after January 25, 1999: +1.780.387.3546); Fax: +1.403.387.4329 (after January 25, 1999: +1.780.387.4329); E-mail: operating@icsc. ab.ca; Website: www.icsc.ab.ca.

Performance Evaluation Issues in Multilingual OCR

September 19th, 1999. Just before ICDAR'99 (see next entry), an International Workshop on performance evaluation Issues in multilingual Optical Character Recognition (OCR) will be held in Bangalore, India. The Workshop's chair will be Tapas Kanungo, University of Maryland, College Park, MD USA and Henry S. Baird, Xerox PARC, Palo Alto, CA USA. The workshop will explore evaluation methodologies for multilingual OCR systems. By 'multilingual' is meant to include systems that are capable of reading more than one language in the same document, as well as one-language-per-document systems that can be easily retargeted to new languages. It is hoped to bring together researchers from many countries to discuss the following and related questions: (1) What methodologies should be used to evaluate multilingual OCR systems? (2) How should accuracies across languages be compared? (3) What ground-truthed data sets are now available in various languages? (4) What kind of datasets need to be collected? How is this to be achieved? (5) Which organizations might be willing to support such an effort? (6) What multilingual OCR evaluation tools and error visualization tools are available or should be developed? (7) What OCR evaluation methods and metrics will be useful for OCR-based machine translation and cross-language information retrieval? The workshop will be a one-day meeting for a maximum of 70 participants. Each participant will submit an extended abstract which will be distributed at the Workshop. Each potential should submit an extended abstract, electronically via E-mail (in plain ASCII), no later than March 30, 1999 to: Tapas Kanungo, Center for Automation Research, University of Maryland, College Park, MD 20742, E-mail: mlocr@cfar.umd.edu. The abstract should include the name, address, telephone, fax, and email address of the author(s). It should ordinarily be limited to six printed pages including references (no figures, please). Longer submissions may be admitted in special cases, e.g. for catalogues of resources. More information can be found on the Internet at: www.cfar.umd.edu/~kanungo/workshop/mlocr.html.

ICDAR'99: Fifth International Conference on Document Analysis and Recognition

20-22 September, 1999. ICDAR'99 will be held at the new technology center of Bangalore, India. General Chair: Sargur N. Shrihari. The conference is sponsored by the International Association for Pattern Recognition (IAPR) [Technical Committees 10 and 11], Indian Institute of Science and the Computer Society of India. This conference is a unique international forum for identifying, encouraging and exchanging ideas on research, development and novel applications dealing with documents--in any language--and how to make the contents of document computer-accessible. The topics will include, but are not limited to: Document Image Processing, Segmentation, Feature Extraction, Distortion and Skew Detection, Text/Graphics Separation, Document Duplicate Detection, Document Image Analysis, Layout Analysis, Logical Structure Analysis, Character Recognition and Segmentation, Segmentation-Free Approaches, Broken and Touching Characters, Isolated Unconstrained Characters, Large Vocabularies, Handwriting Recognition, Drawings & Gestures, Pen-based Interface, Signature Verification, Graphics Recognition, Vectorization, Analysis of Maps, Engineering Drawings Interpretation, Diagrams, Symbol Recognition, Electronic Books and Hypertext, Multimedia, Hypermedia, Applications, Forms and Bank-Check Reading, Postal Automation, Geographical Information Systems, Electronic Publishing Large Information Systems, Musical Score Recognition, World Wide Web Applications, Document Analysis Systems, Document-Based Infor-mation, Retrieval, Document Image Filing, Text-and Graphics-Based Indexing, Information Extraction, Retrieval of Text, Graphics and Pictures, Text and Document Understanding, Text Analysis and Recognition, Use of Linguistic Knowledge, Use of Domain-Specific Knowledge, Multilingual Text Understanding, Performance Characterization and Evaluation, Image Degra-dation Models, Performance Characterization, Benchmarking, Research Databases, Standardization. Paper Submission: January 15, 1999; Notification of Acceptance: April 15, 1999; Camera Ready Paper: May 31, 1999. For more information, please contact: Center of Excellence for Document Analysis and Recognition (CEDAR), State University of New York at Buffalo, UB Commons, 520 Lee Entrance, Suite 202, Amherst, NY 14228-2567 (USA) , Voice: +1 (716) 645-6162, Fax: +1 (716) 645-6176, E-Mail: icdar99@cedar.buffalo.edu, Web: www.cedar. buffalo.edu/icdar99.

WMC'99: Second World Manufacturing Congress

27-30 September, 1999. WMC'99 is organized by the University of Durham, United Kingdom. For more information please visit: www.icsc.ab.ca/ wmc99.htm. Contact: Jeanny S. Ryffel - Planning Division, ICSC International Computer Science Conventions, P.O. Box 279 - Millet, AB T0C 1Z0 – Canada. Email: planning@icsc.ab.ca Phone: +1.403.387.3546 (after January 25, 1999: +1.780.387.3546); Fax: +1.403.387.4329 (after January 25, 1999: +1.780.387.4329).

IJCN99: International Joint Conference on Neural Networks

10-16 July, 1999. Washington, D.C. The IJCNN'99 is organizing many special sessions on subjects related to the application of Neural Networks to solving technological problems. Among the sessions is Handwritten/Printed Text Recognition with Neural Networks, in both on-line and off-line scheme. The goal is to encourage the use of Neural Networks in this challenging area of research, and to provide scientific interaction between researchers and practitioners in industry and government. Theoretical and practical advances will be the focus of this session. The topics of the special session are, but not limited to: Pattern Recognition; Cognitive models for handwritten/printed text recognition; Word segmentation; Word shape extraction; Hardware Implementation; Comparative performance of various NNs architectures for OCR; Novel architectures for feature extraction and classification; Constructing knowledge base from training samples. Instructions for authors and other information can be found in the following web site: http://www.cas.american.edu/~medsker/ijcnn99/cfp.html.

From Basic Motor Control To Function Recovery

22-26 September 1999. This conference will be held at the Black Sea, near Varna (Albena or Golden sands) in Bulgaria. The conference having the subtitle 'Concepts, Theories and Models – Present State and Perspectives', tries to link clinical and theoretical point of views in Motor Control by bringing together leading scientists, leading clinicians as well as young scientists and clinicians who work in the same field but adopt different approaches in their research, particularly by focusing on different levels of the nervous system and by using different techniques of movement analysis. The conference will contain training sessions on the use of various techniques that are planned to be organised and sponsored by the leading Firms working in the field of Movement analysis. An additional objective of the proposed conference, is to offer an opportunity for young scientists from Central and Eastern European countries to update their knowledge and establish new professional contacts which hopefully lead to collaborative arrangements. How the brain can cope with existing internal and external constraints of the body itself to produce a skilful movement was and remains a challenging problem for the scientists in the field of Motor Control. Plasticity, adaptation and motor learning and the fascinating features of the Higher Nervous System, will also be addressed during the meeting. Co-chairs: Gantcho Gantchev and Nikolai Gantchev. Organising Committee: Volker Diets, Mark Latash, Jean Massion, Shigemi Mori, Dejan Popovic , and George Stelmach. Deadline abstract submission: May 1st, 1999. Further information can obtained by contacing Nikolai Gantchev, UPR Neurobiologie et Movements, CNRS, 31 Chemin Joseph-Aiguier, 13402 Marseille cedex 20 FRANCE, Tel: +33.4.91.16.41.00, Fax: +33.4.91.77.50.84; Email: gantchev@lnf.cnrs-mrs.fr.

First International Colloquium of Experts in Handwriting and Documents

This conference organized by the European Academy of Experts in Handwriting and Documents (AEEED) will be held in Paris on December 3, 1999. Preliminary research on the nature and existence of graphic reflexes, including whether or not they are conscious or unconscious, how they are expressed, and if they can be applied in the process of subject identification will be presented. For more information contact: cs@magic.fr or manubeck@aol.com

Third International Conference on Cognitive Modelling

23-25 March 2000. This conference will be held at the University of Groningen, Netherlands. Special interest groups on human computer interaction and eye and hand coordination and external tasks are anticipated. The deadline for contributions is december 15, 1999. For enquires contact: Niels Taatgen (niels@tcw3.ppsw.rug.nl) or Jans Aasman (J.Aasman@research.kpn.com).

Graphics Interface 2000

15-17 May 2000, Palais des Congres, Montreal, Quebec, Canada. This event will present the latest results in computer graphics and human-computer interaction, and will take place in conjunction with four other conferences: AI 2000 (Artificial Intelligence), VI 2000 (Vision Interface), the 10th Annual PRECARN-IRIS (Institute for Robotics and Intelligent Systems), and ISR 2000 (31st International Symposium on Robotics). Contributions are due on November 19, 1999. For more information visit http://www.dgp.toronto.edu/gi or email poulin@iro.umontreal.ca