1990 INTERNATIONAL CONFERENCE ON COMPUTER PROCESSING OF CHINESE AND ORIENTAL LANGUAGES

April 25–28, 1990 Changsha, Hunan, China
# Table of Contents

Message from Program Chairpersons ................................................................. i
Organizing Committee ...................................................................................... ii
Program Committee ......................................................................................... iii
Referee List ....................................................................................................... iv
Plenary Session ................................................................................................. v

Session 1: Natural Language Understanding and Machine Translation

The Chinese Analyzer for Multilingual Machine Translation .......................... 1
   (Zhang Gui-Ping & Yao Tian-Shun)

   (June-Jei Kuo-Wen—Chih Chen and Kimikazu Fujita)

An Exploration on Knowledge—Based Chinese—English MT System ............. 10
   (Li Sheng, Wang Yue-jin, Zhou Ming, Qiu Xiang-hui and Zhao Tie-jun)

Resolution of Long—distance Dependencies in Mandarin Chinese With an Algorithm Based on Functional Uncertainty .......................................................... 15
   (Chu—Ren Huang, Keh—jiann Chen, Wan—Pei Chen, and Tzu—Ying Hu)

The Analysis of Tense and Aspect in Chinese Sentences for Translating Mechanically to English .............................. 21
   (Ren—Rong Hsu and Hsi—Jian Lee)

Unification—Based Word Identification for Mandarin Chinese Sentences ........ 27
   (Ching—Long Yeh, Hsi—Jian Lee and Miao—Jen Tsai)

A Deterministic Algorithm With Multiple—scanning For Chinese Parsing ........ 33
   (Huang Changning and Sun Maozong)

The Generating Strategy And Knowledge Sources Adjustment Algorithms .... 38
   (Pei—shun Tang and Qing—shi Gao)

A Three Dimensiona Chinese—to—english Data Dictionary ......................... 43
   (Liana X. Ye)

Parsing Of Partially—free Word Order Korean Sentences With Hhad—final Concept .................................................. 47
   (Yong—Hoon Seo and Yung—Taek Kim)

A THAI Generalized Phrase Structure Grammar And Its Parser .................. 50
   (Ampai Pornprasertsakul Vilas Wuwongse)

Automated Chinese Text Abstraction—A Human—Machine Co—operative Approach .................................................. 57
   (Benjamin TSOU H.C HO Hing—Lun LIN Godfire K.F.LIU)Caesa S.LU and Ala Y.L. HEUNG)

Readjust Nodes And Tree Expanding For Text Generation .......................... 63
   (Liu Xiao—Yang & Yao Tian—Shun)

A Knowledge Based Method To Understand Chinese .................................... 66
   (Zhao Zhenxi-Gong Yuchang and LiKai)

Development of A Chinese Phrase and Sentence Processing System with Various Input Methods ....................... 73
   (Liu Jiasong)

Session 2: Character Recognition and Document Reading

Overview of Chinese Characters Recognition Technical in China ..................... 78
   (Zhang Xin Zhong)

A Recognition System of Printeo Chinese Characters Text ............................ 84
   (Yan Changde, Liu Xiuying, Wang Yu and Zhang Xinzhou, Li Yan, Ti Wenwen, Shen Liansheng,
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Introduction to the 4 Million Handwritten Chinese Character Sample Library</td>
<td>91</td>
</tr>
<tr>
<td>Selective Correction for Address Recognition Errors</td>
<td>95</td>
</tr>
<tr>
<td>Design of a Printed Chinese Character Recognition System</td>
<td>101</td>
</tr>
<tr>
<td>A Recognition Scheme for Restricted Written Chinese Characters</td>
<td>117</td>
</tr>
<tr>
<td>Text Correction—A Post Process for Optical Character Recognition</td>
<td>119</td>
</tr>
<tr>
<td>A Pracical PC-Based Recognition System for Multifont Printed Chinese Characters</td>
<td>125</td>
</tr>
<tr>
<td>A Tree Coding Method Using Nodes and Strokes for the Recognition of Multi-Font Chinese Characters</td>
<td>130</td>
</tr>
<tr>
<td>Neural Network Based On-Line Handwritten Chinese Character Recognition</td>
<td>135</td>
</tr>
<tr>
<td>A Microstructure-Based Omnifont Printed Chinese Character Recognition System</td>
<td>145</td>
</tr>
<tr>
<td>Computer Reading And Recognition of the Printed-Chinese Character Photographic Document</td>
<td>148</td>
</tr>
<tr>
<td>A Novel Approach to Chinese Text Analysis and Automatic Document Indexing</td>
<td>153</td>
</tr>
<tr>
<td>Evaluation of Chinese Word Processors</td>
<td>157</td>
</tr>
<tr>
<td>Cross-Script Issues For Chinese, Japanese, and Roman Word-Processing In A Macintosh Environment</td>
<td>168</td>
</tr>
<tr>
<td>A Chinese-English Compatible Relational DBMS:CXDB</td>
<td>186</td>
</tr>
<tr>
<td>MIS Structural Design Based on Definitions</td>
<td>191</td>
</tr>
<tr>
<td>The Analysis of Implicit Concepts in Automatic Indexing of Chinese Document</td>
<td>196</td>
</tr>
<tr>
<td>An Integrated OA System Model of University Management</td>
<td>202</td>
</tr>
<tr>
<td>A Multilingual Computing Environment Based on X Window System</td>
<td>206</td>
</tr>
<tr>
<td>Using Markov Sequences for Disambiguation in Chinese Phonetic Input</td>
<td>226</td>
</tr>
<tr>
<td>A Framework for a Chinese Phonetic Typewriter System</td>
<td>236</td>
</tr>
<tr>
<td>Session 3: Database and Information System Design</td>
<td></td>
</tr>
<tr>
<td>Session 4: Intelligent Terminals and Workstations</td>
<td></td>
</tr>
</tbody>
</table>
The Japanese Characters Input in A Multilingual Context ................................................................. 242
  (Fethi AMARA, Jean Christophe FRANJAUD and Abdel Malek BOUAMEL)
Design of A Total Chinese Input Simulation System ............................................................................. 246
  (K. Y. Cheng and M. S. Hwu)
Session 5: Font design and generation
Evaluation of Japanese Character Fonts on a PostScript Printer ......................................................... 255
  (Zengo FURUKAWA, Toyomi KAWAMURA and Kazuo USHIIMA)
Statistics of Chinese Character Lattice's Centre of Gravity and Relation Between Stroke Number with Black Degree ................................................................. 261
  (Fan Jianping)
High-Precision Small-Volume Brush-Written Chinese Characters With Pattern Synthesis of Hierarchical
Synthesis by Analysis .............................................................................................................................. 266
  (Zhang Xianrong)
Session 6: Electronic typesetting and desk top publishing
Development of Chinese Electronic Publishing System .......................................................................... 272
  (Wang Xuan)
The Design and Practice of <<Ke Yin>> Microcomputer Typesetting System .................................... 279
  (Jia Jixun)
Automatic Formatting and the Design of Typesetting Language ............................................................ 285
  (Zeng Yunfeng)
A System to edit and Set type Tibetan Text-files .................................................................................... 290
  (Luo Shengyi and Li Minghua)
The Technical Problem on the Mongolian Table-Printing System ...................................................... 294
  (Gardi Zhang, Zhu Liu, Yan-wan, Lin Yi-hong, Han Mai, Wang Shi-wei and Wei Jianping)
Session 7: Properties and statistics of Chinese and oriental languages
Dynamic Hierarchy-Structure Phrase-base Optimal Model and Processing ....................................... 299
  (Zhong Weiwu and Su DongZhuang)
Writing Style of Japanese and Hiragana .................................................................................................. 303
  (TATEISI Yuka, ONO Yoshihiko, YAMADA Hisao)
Session 8: Standardization Problems in computer processing of Chinese document reading
Standardization Problems In Chinese Font Information Processing ...................................................... 308
  (Xie Kezhong)
The Design of Code System Architecture for Chinese and Multi-lingual Information Processing ...... 314
  (Zhao Po Zhang)
Essential Subjects in Standardization of Handling National Characters .............................................. 314
  (Chen Mingyuan)
On the Structures of RAM-Based Chinese Characters Libraries ....................................................... 321
  (Qian Peide)
Chinese Computer System and Design .................................................................................................. 325
  (Yang Mingtao, Chen Songqiao and Yang Yuanheng)
Session 9: Speech recognition and output
Square-Moving DP Matching Algorithm for Chinese Connected Word Recognition ....................... 330
  (Li Jun and Guo Rongjiang)
Coarse Recognition of Chinese Isolated Word(syllable) ...................................................................... 335
  (Yang Xinjun, Huang Zenzhen and Pan Jielin)
The Study of Knowledge-based Speech Recognition and Adaptive Learning ..................................... 340
Session 1: Character Recognition and Document Reading

Printed Chinese Character Recognition

—Application of Algorithm of Calculation of Similarity in FOURIER Spectra

(XU Zhi-Yong and THOMASSEN Wolfgang)

The Intellectualized Direction of Pattern Recognition

(Wang Zhen-Qing, Shen Qing and Liu Shao-Chu)

A New Classification Method On Optical Recognition of Restricted Handwritten Chinese Character

(Xia Ying, Wu ZhiBiao and Sun Chengjian)

A Correlative Attributed Relational Graph Representation and Inexact Matching on handwritten Chinese Character Recognition

Session 2: Knowledge base, expert system and natural language interface

VICE-FORTRAN: A Visual Chinese form Translator

(C. C. Chang, L. C. Chow and S. D. Shen)

Design and Evaluation of A Relational Knowledge Base Prototype Machine

(Wang Zhiying and Ci yungui)

A Pipelined Strategy for Query Execution

(Wang Honggu and Jing Ning)

Abstract
Contour Feature Points and Heuristic Classifier Moder for Recognition of Chinese Characters ......................................................... 426
Cheng Gongxian, Su Dongzhuan and Zhang Xinzhong
The Pre-Classification Method of the Recognition of Printed Chinese Characters .............................................................................. 427
Liu Tun and Zhou Youwen
On the Recognition of Printed Tibetan Characters ............................................................................................................................. 428
Luo shengyi and Yang shuguang
Knowledge-Based Document Image Analysis ........................................................................................................................................ 429
Zeng Zheng and Ding Xiaoqing
Decision of Weight in the Weighted Matching of Chinese Character Recognition .............................................................................. 430
Gu Xiao-feng and Li Bao-rong
Stroke Direction Feature in Recognition of Handprinted Chinese Characters ......................................................................................... 431
Gu Xiao-feng and Bai Min-zhu
Pattern Recognition on Handwritten Characters ................................................................................................................................. 432
Mo Liyu and Ye Deming
A Machine Learning Based Approach to Hand-Written Chinese Character Recognition ................................................................. 433
Jiarong Hong, Xiaoqian Xu and Chengjiang Mao
Automatic Analysis on Ancient Chinese Prose Text ............................................................................................................................. 434
Zhu Xianing, Wu Youshou, Ding Xiaoqing and Li Enyou
A Strategy for Knowledge-Based Recognition of Handprinted Chinese Characters .................................................................................. 435
Hao-Ru Lu and Yuan-Yuan Yang
The Realization of 2-D EAG for the Recognition of Hand Printed Chinese Characters .............................................................................. 436
Ming Zhao
Hollow Chinese Character Generation and Optimization ......................................................................................................................... 437
Zhou Xiaokuan and Luo Huizhu
A Fast Thinning Chinese Character Method ........................................................................................................................................ 438
Luo Zhongguang, Zhou Siqing and Fu Meng Ru
Postprocessing for Handprinted Chinese Characters Recognition Using Vocabulary Knowledge Database .............................................. 439
Wang Linquan and Zhang Wenyi
Session 2: Speech Recognition and Output
Mandarin Speech Recognition System Using Similarity Comparison and Binary Pattern Match .............................................................................. 440
S. W. Lee, C. C. Lee and L. Y. Wei
Speaker Adaptation Methods for Speech Recognition Systems Based on Linear Predictive Hidden Markov Models ....................... 441
Jin-Hui Xie, Yu-Qing Gao and Jian-Hua Tu
Syllable Segmentation and Four Tones Recognition of Chinese Continuous Speech .................................................................................. 442
Guo Rongjiang and Lilun
Noisy Speech Processing--A United and Optimal Information Approach .............................................................................................. 443
Ji Ming and Shen Zhenkang
A Regular Analysing Method For Chinese Vowels Recognition ............................................................................................................. 444
Yu Xiaofeng and Ye Deming
The Analysis Method of Speech Recognition Based on Cognitive Psychology .................................................................................. 445
Li Huiqin and Wang Pingyang
An Application of Simulated Annealing to the Design of Vector Quantizer for Speech Recognition ....................................................... 446
Ni Jinfu and Li Xuiyiao
A Intelligent System for Pinyin—Character Translation ......................................................................................................................... 447
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDTW—A New Dynamic Time Warping Algorithm</td>
<td>448</td>
</tr>
<tr>
<td>New Training Method of Continuous Parameter HMM</td>
<td>449</td>
</tr>
<tr>
<td>Applications of Neural Networks to Phonetic Preclassification</td>
<td>450</td>
</tr>
<tr>
<td>The Syntactic Analyser Awasp</td>
<td>451</td>
</tr>
<tr>
<td>Expanded Hidden Markov Model and Application on Speaker Adaptations</td>
<td>452</td>
</tr>
<tr>
<td>Design of High Quality LPC Speech Synthesizer Tuit to LSI Chip Design for Our Country</td>
<td>453</td>
</tr>
<tr>
<td>Vision-Based Speech Communication</td>
<td>454</td>
</tr>
<tr>
<td>The Korean-Chinese Speech Information Processing System</td>
<td>455</td>
</tr>
<tr>
<td>Session 3: Natural Language understanding and Machine translation</td>
<td></td>
</tr>
<tr>
<td>Ambiguity In Chinese And Resolving Strategies</td>
<td>456</td>
</tr>
<tr>
<td>Disambiguation In Chinese Language</td>
<td>457</td>
</tr>
<tr>
<td>Processing of Polysemy in Machine Translation</td>
<td>458</td>
</tr>
<tr>
<td>Semantic Parser in the Japanese / Chinese Automatic Translation System~NDJCATS</td>
<td>459</td>
</tr>
<tr>
<td>Automatic Analysis of Chinese in Machine Translation</td>
<td>460</td>
</tr>
<tr>
<td>A Chinese Parser Using DCG</td>
<td>461</td>
</tr>
<tr>
<td>General Situation, Prospects and Discussion about Difficult Points of Research on Chinese Language</td>
<td></td>
</tr>
<tr>
<td>Understanding by Computer</td>
<td>462</td>
</tr>
<tr>
<td>The Application of Functional Unification Grammar in Chinese Generation</td>
<td>463</td>
</tr>
<tr>
<td>A Japanese to Chinese Machine Translation System</td>
<td>464</td>
</tr>
<tr>
<td>A Chinese Natural Language Interface For Enterprise Management System</td>
<td>465</td>
</tr>
<tr>
<td>A Chinese Syntax Analyzing System by Heuristic Rule</td>
<td>466</td>
</tr>
<tr>
<td>Researching Situation and Development of Written Chinese Word Automatic Segmentation</td>
<td>467</td>
</tr>
<tr>
<td>An AI Methodology of Automatic Word Segmentation in Written Chinese</td>
<td>469</td>
</tr>
</tbody>
</table>
The Analysis Of Connections And Relations Between Sentences In Modern Chinese Texts
(Kaiying Liu and Erhong Yang)

The Parsing of Multi-NP Chinese Sentences
(Zhou Jingye and Ye Zhenghua)

Session 4: Coding schemes, keyboard design and evaluation
“Chinese Words and Phrases Processing System” Using the Method of Pinyin Transformation (Abstract)
(Fang Shizeng)

A Heuristic Method of Memorizing Hanzi Input Keyboard
(Hu Xuanhua, Zhang Pu and Li Huiqin)

A Brief Review on Taiwan Model of Evaluation for Chinese Character Input Scheme
(Chen Weixi and Yang Cixin)

Virtual Keyboard Input Method for Multilingual Processing System
(Zhou Ming-Quan and Hao Ke-gang)

Research on Coding Chinese Characters by Their Particularities of Vagueness of Sykkabkes
(Wang Zhengrong and Wen Chengyou)

The Pinxxie Theory: A Unified Field Theory of Written Languages
(H. C. Tien, M.D.)

Designing Chinese Character Input System Compatible With Various Coding Methods
(Zhang Tiesheng)

QJ26-3—A Chinese Coding Scheme of High Coding Efficiency
(Xie Kezhong, Pen Chang and Wang Zhonglin)

Design and Implementation of HT Phrases Input System
(Zhou Daqing)

Session 5: Intelligent Terminals and Workstations
Design and Implementation of the Chinese Window System
(Fang Hong)

Two Problems in Chinesization of Sethost
(Zhou You-chang, Shi Yong-huan and Huang Si-qi)

The Chinesization of DECnet—DOS
(Zhou You-chang, Shi Yong-huan, Liu Jun-lin Huang and Si-qi Yang Wei-min)

Huang-He CC-88 Chinese Word-Processing and Communication System
(Huang Xi Xiang and Hu Pei Cheng)

A Super Chinese Disk Operating System
(Wang Xiaolong, Bai Xiaohua and Wang Kaizhu)

Design of Character Channel in an Advanced Computer Display Terminal
(Yu Lifu and Zhou Siling)

On the Pracitcal Chineseizing Technique
(Chen Haoying, Sun Bin and Yang Lixin)

CEWP—A New Chinese—English Word Processor
(Zhao xianfu and Lin Yaoquan)

A Programmable Meta Chinese Input Interface
(Ng Toh-Miang)

QJT V System For Editing Chinese T.V. And Teaching Programs
(Pen Xinan, Sheng Guoxing and Xie Kezhong)

Session 6: Knowledge base, expert system and natural language processing
Research on a PROLOG—based Knowledge Programming Environment .............................................. 491
(Deng Tieqing, Su Jinshu, Wu Quanyuan and Wang Zhiying)

Data Conversion of Nonhomogeneous Databases ............................................................................. 492
(Liu Xiangqin)

Study About Database of Chinese Information System ....................................................................... 493
(Zhong Bokang and Lu Xizheng)

A Database Inquiry System with Chinese Language Interface ....................................................... 494
(Yan Xiuying, Yang Xingshun and Qiu Guganqun)

An Intelligent Computer—Assisted Instruction System ....................................................................... 495
(Luo Hiaorong)

Research on Drnest Expert System Building Tool ............................................................................ 496
(Yang Runsheng and Zhang Xiaoheng)

A General Expert System Tool GMES .............................................................................................. 497
(Xu Mingang, Guo Jing and Gong Leiguang)

Session 7: Font design and generation
A Survey and Evaluation of Chinese Character Design Systems with Their Possible Research Directions ........................................ 498
(Fan Jianping)

On the Style and Font of the Chinese Character Library for Sifting Ancient Books ....................... 499
(Zhang Pu)

Shape Transformations for Generating and Recognizing Chinese Characters .................................... 500
(Gu, Q.L., Suen, C.Y., Bui, T.D. and Li, Z.C.)

Shape Transformations with Arbitrary Boundary for Chinese and Oriental Languages ................. 501

A Research in Irregular Transformation of Chinese Characters ....................................................... 502
(Liao Zhong Wei)

Session 8: Properties and statistics of Chinese and oriental languages
Index File System for Chinese Vocabulary ............................................................................................ 503
(He Kekang)

Distribution of Adjectives in the Dictionary of Syntactic Configuration ........................................... 504
(Gong Yanru)

Session 9: Next—generation computers and oriental language processing
A Concept—Formation System for Chinese Language Learning ....................................................... 505
(kai Chu, Ph.D.)

New Tools for Chinese Character Information Processing ............................................................... 506
(Wang Honggu, Sun Maoying and Jing Ning)

Session 10: Electronic typesetting and desk top publishing
Note Processing in Ancient Chinese Books Typesetting System ..................................................... 507
(Chen Hao)

On Chinese Character Working and Automatic Documents Typesetting with A Microcomputer .... 508
(Jianjun Hou)

CTSS——— A Typesetting System for Chemical Formulation ............................................................. 509
(K.Q.Xing and Wang Ping)

The "Great Wall" Edit System for Scientific Technical Literal Drafts .............................................. 510
(Huang Xihong)

Session 11: Standardization problems in computer processing of Chinese and oriental languages
Analysis of the Research Situation of the Information Processing of Our Country’s Minority Nationality Language and Characters and the First Try of Probing into the Way to Deal with the Problems in Developing the Research

(Zheng Xiongxia)

A Chinese BASIC with the Chinese Data Type

(Xiao Xiaoli, Yang Mingtai and Lin Shangwei)

A Chinese FORTRAN with the Chinese Data Type

(Xu Liping, Chen Songqiao and Yang Mingtai)

A Multilingual Word Processing System With Compatibility on Time and Space

(Xu Shou-chun)

A Model of Chinese Computer Operating System

(Yang Changxing, Yang Mingtai and Lin Shangwei)

Sessions 12: Database and Information System Design

A Graphical Tool for the Management of External Schema

(Li Xue)

A Relational Data-Base Management System with Chinese Data Type

(Huang Ping, Liu Shangwei and Yang Mingtai)