## **Table of Contents**

## **Preface, Sponsors and Committees**

## I. Color Science and Technology

<b>Study on Color Spectrum Prediction Accuracy of CYNSN Model</b> Z.J. Si, Y. Hu, J. Wang and Y. Li	3
A Black Generation Method for Black Ink Hiding Infrared Security Image C. Li, C.Y. Wang and S.J. Wang	9
Study on the Color Representing Accuracy of Spectrum with Different Wavelength Range and Interval J. Niu, X.D. Zhang and Q. Wang	13
Analysis on Color-Distinguishing Threshold of Printed Samples and Chromatic Characteristics of Human Eyes W.Y. Li and H.L. Dong	18
Research on the Imaging Mechanism of Additive Color of Fluorescent Ink-Jet Ink X.F. Wei, S.H. Gao, B.Q. Huang and W. Zhang	22
Application Research on Image Color Gamut Visualization Using Volume Rendering Method	27
Y.W. Jiang, M.H. Lin and Y.H. Luo  A Graphic/Picture Classification Method Based on Spatial Characteristics of Colors	27
S.Y. Cai, X. Nie and S.Q. Guo	31
Three-Dimensional Color Gamut Visualization of Digital Output Device Based on ICC Profile	
Y.H. Luo and M.H. Lin	36
Effective Dot Area's Calculating Based on YNSN Model C.F. Zhao, Q. Han, C.C. Chi and Q.J. Meng	40
The Research on Color Characteristics of Four Mainstream Monitor Y. Liu, M. Zhou and Y.F. Xu	44
Research on Application of iCAM in Printing Image Reproduction X.Z. Li, G.X. Chen, C.J. Jia, L. Zhao and A. Xu	48
Research on Reconstruction of Spectral Reflectance Based on Principal Component Analysis	
Y. Zhang and S.S. Zhou	53
<b>Application of Near Infrared Spectroscopy in the Analysis of Printing Color Detection</b> H.W. Lu, H. He, J. Ji, G.Q. Liu and Y. Hu	59
Research on Robustness of Color Device Characteristic Methods Based on Artificial Intelligence	
C. Zhi, Z.J. Li and Y. Shi	65
<b>The Theory of the Density-Based Gravure Spot-Color Matching</b> R.B. Luo, N. Jiang, S.S. Zhou and Y. Zhang	69
Spot Color Matching Method Based on Preserved High Saturation for Inkjet Digital Proofing	
H. Su, Y.H. Yi, J.H. Liu and M.J. Miao	74
The Experimental Research on Tiled Multiple Projectors Displaying Based on ICC Mechanism  Z. Liu, M. Zhu and J. Yu	80
Study on Correlation of Color Components Image in Different Color Spaces Y. Jin, Z. Liu, P.F. Wang, S.G. Liu and H.J. Zhai	86
Measuring and Adjusting the Printed Color Using the Complex Frequency Spectrum Color Characteristic Values Y.C. Pang, D.Y. Pang and Z.J. Li	92
A Discussion on Printing Color Difference Tolerance by CIEDE2000 Color Difference	
Formula H.X. Liu, B. Wu, Y. Liu, M. Huang and Y.F. Xu	96

Study on the Applied Performance of Color Inks	100
Y.K. Ding, Y.F. Xu, L.H. Li and W.B. Li	100
Color Application Techniques on Map Designing in Prepress S.D. Liu, S.J. Chen, B. Sun and H. Liu	105
Framework Design of Multispectral Color Management H.W. Wang, J. Li and G.X. Chen	109
Research on Chromaticity Characterization Methods of the Ink Trapping J.H. Liu and S.H. Gao	113
A Print Performance Study of the Environmental Friendly Wide Gamut Process Inks L.Y. Ma and T.Y. Hao	119
Influence Analysis of Color Input Target to the Scanner Color Characteristic H.J. Xin and Y. Liu	123
II. Image Processing Technology	
Analysis of Area Field Quality Based on ISO 19751 and ISO 13660 Y.M. Zhou, Z.M. Jiang and Z.Y. Jin	129
A Self-Environment Adaption Model for Cross-Media Reproduction of Digital Image X.Y. Xu, L.J. Wang and Q. Chen	134
Researches on the Information Hiding Technology Used in Paper-Based Document Images W. Guo, Y.X. Liu, Z. Zong and W.F. Qi	138
Research of Digital Watermarking Algorithm in Wavelet Domain Based on Arnold Transformation and SVD T. Sheng and X.P. Zhao	143
Research of Image Location for Print Whole Image On-Line Detection System J.Q. Hao, W.Y. Tang, R.X. Jiang and D.Y. Yi	147
Line Output Quality Assessment of Digital Printers Y.H. Song, P.F. Wang and Y.F. Xu	152
<b>Applied Research of Assessment Methods on Video Quality</b> C. Gu and Z.J. Si	157
Comparative Research in Image Mosaic Based on the Similarity Measure of Print Detecting D.Y. Yi, W.Y. Tang and J.Q. Hao	163
An Improved Method of USM Processing on Color Image J.H. Liang and L. Gong	168
Research on Correction Algorithm for Print-Scan Resistant Digital Watermarking Algorithms Based on DWT Z.J. Zhang, Z. Liu and H. Yu	172
Study on the Assessment Method of Print Mottle Using Discrete Wavelet Analysis G.D. Liu, M.Y. Zhang and Q.P. Liang	177
Halftone Image Quality Assessment Based on Digital Watermark Y.F. Zhong, L.J. Fu, J. Zou and R.H. Deng	181
Effect of Input Precision on Line Micro Quality Measurement X.M. Cui, G.X. Chen and H.M. Wang	186
The Comprehensive Processing Methods on Reproducing of the Image of Relic on Subtle Levels	
X.Q. Chen Exploration for the Gratings Used for Auto-Stereoscopic Three-Dimensional Printing	190
R.R. Qin, W.C. Xu, S.Y. Luo and X.L. Zhang	195
III. Digital Technology	
Advertising Efficacy Research on E-Paper Application for MRT Station Bulletin Board Y.C. Hsieh, Y.Y. Lee and S.Y. Cheng	203
The Construction of a Knowledge Discovery Model on In-Depth Analysis and Reporting by Exploring Taiwan's Examination Database M.J. Hsu, C.P. Ho and F.N. Han	207

A Consumers' Preference Study on E-Book Reading	
T.Y. Hao, F.N. Han and C.P. Ho	213
Experimental Study of Digital Printing Methods for Producing Personalized Packaging Y.M. Zhou, X.Y. Rong and Z.M. Jiang	217
A Study of E-Book Industry's Cooperation in Taiwan T.Y. Hao, L.Y. Ma and H.J. Lee	223
A Study of E-Book Readability M.T. Tai, C.K. Lin, Z.R. Ke and P.Y. Chen	227
A Study of Reading Fatigue M.T. Tai, Y.H. Yang, G.N. Zu and Y.J. Hsieh	231
Realization of Digital Printing Workflow for Domestic Small and Medium-Sized Printing	
Enterprises B.Z. Qiu, X.L. Liu, W. Wei, H.N. Zhou and X.Y. Zuo	235
IV. Process Research and Standardization	
The Research on EHD Micro-Jet Printing Technology under Pulse Voltage J.J. Tan, Z.N. Tang and Q. Wang	243
A Preliminary Study on Artistic Transcending of Printing Dots X.Z. He, Y. Zhang and L.P. Xie	247
A Study of Color Variance between Vacuum Plate of Aluminum and Aluminum Foil Using	
UV Offset Printing C.L. Chen, M.C. Lo, M.C. Wei and S.W. Wang	253
Model of Ink Quantity Control Based on Colorimetry System L. Jiang, S.S. Zhou and Y. Cui	258
<b>Research and Application on Screen Soft Proofing Technology in Printing Quality Control</b> Z.J. Si, J. Wang and C. Gu	263
Influence of Inkjet Paper Coating Structure on Paper Properties and Print Performance Y.C. Zhu, Y.Z. Chen and Z.J. Zhang	269
The Effect of UV Inkjet Ink's Performance on the Line Printing Quality W. Zhang, X.F. Wei, B.Q. Huang and L. Zhao	273
<b>Quality Control Parameters Study on Flexography Cyrel Digital Imager System</b> Y. Wang, Y.Y. Zhou and W. Zhang	278
Research on the Influencing Factors to Printing Quality of Edible Ink-Jet Printing Ink J.M. Sun, X.F. Wei and B.Q. Huang	282
A Study of Print Quality of UV Ink-Jet Printing on Glass S. Liao, M.T. Tai, S.C. Lin and C.K. Lin	287
Study on the Model of Chromaticity Closed-Loop Control for Print Online Detection R.Z. Shi, K.B. Fan, X. Zhou, K. Yang and H.Z. Shi	291
Study on the Effect of Paper Properties on the Dot Reproduction Attributes Based on the	
Grey Relational Analysis F.Q. Chu and C.Y. Li	297
Application of Grey Relational Analysis and SVM for Solid Density Control in Offset Color Printing	
F.B. Chen, Y.Z. Chen and Z.J. Zhang	302
A New Vector Dot Generating Algorithm for Digital AM Screening Y. Yang and X.P. Zhao	307
The Processes of Practicing Green-Mark of Printing Companies in Taiwan F.N. Han and S.Y. Tzeng	311
A Study of Special Printing Used in the Theories of Graphic Design P.L. Liau, J.L. Luo and G.N. Zu	315
Offset Printing Quality Characteristics of Rich Mineral Paper Y.C. Hsieh, K.K. Lee, S.Y. Cheng and C.C. Kao	320
Study on the Printability of UV-Curable Inkjet Ink on Different Printed Materials X. Yang, X.F. Wei, B.Q. Huang, W. Zhang and L. Zhao	324
Research on the Influence of Ink Surface Tension to the Formation of Ink Droplet C.J. Jia, G.X. Chen, X.Z. Li and L. Zhao	329

Research on Parameters and Printing Reproduction Characteristics of Concentric Screening	
Q. Wang, X.F. Zhou and Q. Yi	334
The Study on Color Print Quality Attributes of In-Mold Roller Using Digital Inkjet Printing C.L. Chen, M.C. Lo, Y.T. Su and Y.T. Chang	340
Color Gamut of UV Wide-Format Inkjet Printing on Special Substrates Y.C. Hsieh, H.T. Lee and S.Y. Cheng	345
Theoretical Research of Color Reproduction on Concentric Dot Q. Wang, X.F. Zhou and X.H. Liu	349
Research on Computing Model of the Cell Volume for Electronic Engraved Gravure P.J. Deng, G.M. Zhang, W. Fang and J.H. Guo	355
V. Mechanical Engineering and Numerical Control Technology	
A Fault Diagnosis Method for the Roller-Marks in Offset Printing Machine Based on	
<b>Texture Recognition</b> Z.F. Xu, H.Y. Zhang and L.H. Ren	361
<b>Decoupling Control for Unwinding Tension Control Systems</b> M. Bian and M. Yang	367
Research on the Suction-Tape Feeding Technology Maturity of Printing Press Based on	
TMMS X. Zhang and Y. Li	372
Vibration Analysis on Convey Paper Belt of Infeed Unit W.C. Bao, H. Chen and Y.M. Liang	377
VI. Materials and Detection Technology	
The Influence of Process Factors on Liquefaction Residue Rate of Wood Packaging Waste C. Yuan and X.J. Ma	385
The Finite Element Study of the Compressive Strength of Typical Waveform Corrugated Box	
W. Yuan, W.C. Xu, G.M. Zhang and L.H. Xie	390
Detecting the Eight Kinds of Organic Solvent Residue in Paper by HS-GC/MS Y.H. Xing, J. Wu, Z.Y. Wang and K. Ding	395
Research on the Ink Absorption Test Method of High Reflectivity Paper Q.W. Wang, S.Y. Fu and G. Chen	401
Synthesis and Characterization of Foamed Cassava Starch Material Y. Liu, S.S. Li, X.Y. Yang and C.X. Huang	405
Study on the Printability of Coated Paper on High-Fidelity Digital Printing	410
Q.F. Chen, G.X. Chen, B.L. Tang and J.L. Tai  The Application of Gray Associated with Neighborhood Characteristics in the Defect	410
<b>Denoising</b> A.J. Wei, Q. Li and W. Tang	414
Study on the Technical Conditions of Old Newspaper(ONP)/ Recycled-Polypropylene(rPP) Composites	
X.L. Zhang and X.F. Bo	418
Use of Microcapsules of Oregano Essential Oil to Extend the Shelf Life of Strawberries G.F. Liu, J.Q. Wang and Y.Z. Zhao	422
Research of the Factor that Influence the Glossiness of Water-Based Tipping Paper Gravure Varnish	
M.J. Yu, B.Q. Huang and X.F. Wei	426
Preparation and Properties of Anionic Polymer Emulsion in the Presence of a Reactive Surfactant H.S. Lu, Z.X. Li, Y.G. Feng and J.L. Pu	430
Application of Water-Based Magnetorheological Fluid in the Production of Stereoscopic	<del>1</del> 30
Printing Grating Z.W. Zhu, G.X. Chen, Q.F. Chen and B.L. Tang	435

Study on the Double-Layer Structure Thermal Imaging System J. Cao, W.M. Zhang and J.L. Pu	440
The Research of Coating Process for Paper-Based Printing Plate N. Wei and X.X. Hao	444
Synthesis of a Novel Low Dielectric Constant Fluorine Containing Epoxy J.Y. Lv, Y. Meng, L.F. He, T. Qiu, X.Y. Li and H.Q. Wang	448
Study on a Characterization Method of Curing Rate of UV Curing System Based on Rheokinetics	
B.Q. Huang, K.Y. Luo, X.F. Wei, L.Y. Gu and M.Q. Yu	454
Synthesis and Property of Water-Soluble Hyperbranched Polyacrylate Emulsion Y. Yu, X.L. Xin, Y.N. Wei, H.Q. Liu and S.X. Yang	460
Research on the Surface Tension of Water-Based Ink-Jet Ink B.Q. Huang, L. Jia, J.M. Sun and X.F. Wei	464
Investigation on Post Treatment of Nano-Size Silver Conductive Film W. Zhao, L.H. Li, X.W. Hu and L.X. Mo	470
Study on Sterile Anti-Shedding UV Ink Used on PE Bottle Cap Z.C. Qu, G.X. Chen and B.L. Tang	475
Study on Thickening after Preparation Phenomenon of Alcohol-Based Gravure Ink Y.J. Xu, X.F. Wei and B.Q. Huang	480
The Influence of Pigmental Surface Sizing on the Physical and Laser Printing Properties of	
Paper Z.J. Zhang, Y.T. Han and Y.Z. Chen	486
<b>Study on Preparation and Property of Acrylic Resins Used for Water-Based Ink</b> W.T. Huang, G.X. Chen, B.L. Tang and M.G. Yu	491
Study of Edible Ink Y.H. Su and X.P. Zhao	497
A Nano-Silver Inkjet Conductive Ink with Excellent Adhesion J. Ran, L.X. Mo, W.B. Li, W.W. Li, X.M. Fan, J.L. Fu and L.H. Li	501
Effect of Solvent on the Property of the Infrared Absorbing Inkjet Ink L. Yang, X.F. Wei, B.Q. Huang, W. Zhang and Y. Yue	505
Effects of Fillers on the Transfer Properties of UV Waterless Offset Ink L.Y. Gu, K.Y. Luo, B.Q. Huang and Y.D. Song	510
Preparation of Cu NPs Suspension for Conductive Ink W.B. Li, L.X. Mo, W.W. Li, X.M. Fan, J. Ran, J.L. Fu, Y.F. Xu and L.H. Li	514
Investigation on Factors Influencing Fluorescence Intensity of Red Fluorescent Inkjet Ink S.H. Gao, X.F. Wei, B.Q. Huang, W. Zhang and X.W. Hu	518
Preparation of Water-Based Nano-Silver Gravure Conductive Ink Used for Printed	
Electronics W.W. Li, L.X. Mo, J.L. Fu, W.B. Li, J. Ran, X.M. Fan, Y.L. Li and L.H. Li	523
Study on the Dispersity of Black Water-Based Covering Ink	5 <b>2</b> 5
D.D. Wang, B.Q. Huang, X.F. Wei, J.H. Liu and S. Liu	527
<b>Modification of γ-Al<sub>2</sub>O<sub>3</sub> as Ink-Jet Printing Paper Coating Pigment by Coupling Agents</b> L.H. Guo, Q. Zhu, Z.J. Wang and X.H. Guo	532
Research on Formula of Dye-Based UV-Curable Ink for Inkjet Y. Zhi	537
The Study of the Affect Factors on Color Fastness to Crocking of Inkjet Ink J.F. Yan, B.Q. Huang and X.F. Wei	543
Influence of Resins on Properties of Copper Screen Printing Conductive Ink X.M. Fan, L.X. Mo, W.B. Li, W.W. Li, J. Ran, J.L. Fu and L.H. Li	547
<b>Study on an Aliphatic Polyurethane Laminating Adhesive Based on Castor Oil</b> S.L. Chen, G.X. Chen and J.W. Liu	551
Preparation of Porous Cellulose Packaging Films in Alcohol Coagulation S.S. Gao, J.Q. Wang, X.F. Ma and L. Zhao	557
A Comparison of Soxhlet Extraction and Ultrasonic-Assisted Extraction for Analysis of Photoinitiators in Printed Cartonboard Food-Packaging Materials	
C. Ding, F. Wang, M.X. Pang, X.X. Yi, F. Tan, Y. Xu and J.H. Qi	561

Research on Maleic Anhydride Improving the Interfacial Compatibility of PLLA and	
OMMT by Grafting Method R.X. Duan, K. Guo, Y.N. He, J.Z. Chen, M.J. Niu, L.X. Wang and X.F. Li	567
Thermal Decomposition Kinetics of PLLA/Talc/TBC Composites K. Guo, X.Q. Shen, Y.Y. Zhan, J.Z. Chen, M.J. Niu, Y.K. Liu and X.F. Li	572
A Case Study of Carbon Footprint on Liquor Packaging Y.B. Fu, W.C. Xu, Y.R. Jiang and G. Zhou	577
<b>Preparation and Properties Research of Anti-Fogging Polypropylene Packaging Films</b> X.J. Gao, L.Q. Huang and X. Li	581
Gas High Permeability and Ethylene Adsorption Active Packaging for Strawberry Preservation	
Y.R. Jiang, Y.B. Fu, D.L. Li and W.C. Xu	586
The Antibacterial and Preservation Performance of Cling Wrap Coated with Nano-Silver Film	
G.M. Zhang, Q. Chen, W.C. Xu, F.J. Yang, L.Q. Qiu and W. Yuan	591