

TOPICALITIES

Edited by Markéta Držková

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News & more

A regular update on ISO standards for graphic technology

This time, the news on the standards in the field of printing and graphic technologies that are developed under the direct responsibility of the technical committee ISO/TC 130 are more extensive. Among the reviewed documents, those reconfirmed during the last 12 months include ISO 2846-2:2007 Graphic technology – Colour and transparency of printing ink sets for four-colour printing – Part 2: Coldset offset lithographic printing, ISO 12218:1997 Graphic technology – Process control – Offset platemaking, ISO 12640-3:2007 Graphic technology – Prepress digital data exchange – Part 3: CIELAB standard colour image data (CIELAB/SCID), ISO 12645:1998 Graphic technology – Process control – Certified reference material for opaque area calibration of transmission densitometers, ISO 15076-1:2010 Image technology colour management – Architecture, profile format and data structure – Part 1: Based on ICC.1:2010, ISO 16612-1:2005 Graphic technology – Variable printing data exchange – Part 1: Using PPML 2.1 and PDF 1.4 (PPML/VDX-2005), two parts of ISO 15930 Graphic technology – Prepress digital data exchange using PDF from 2010 – Part 7: Complete exchange of printing data (PDF/X-4) and partial exchange of printing data with external profile reference (PDF/X-4p) using PDF 1.6 and Part 8: Partial exchange of printing data using PDF 1.6 (PDF/X-5), ISO 16612-2:2010 Graphic technology – Variable data exchange – Part 2: Using PDF/X-4 and PDF/X-5 (PDF/VT-1 and PDF/VT-2), and ISO 12640-1:1997 Graphic technology – Prepress digital data exchange – Part 1: CMYK standard colour image data (CMYK/SCID). Further, ISO 16763:2016 Graphic technology – Post-press – Requirements for bound products, ISO 12632:2015 Graphic technology – Ink, paper and labels – Requirements on hot alkali penetration and resistance, ISO 14861:2015 Graphic technology – Requirements for colour soft proofing systems, ISO 17972-1:2015 Graphic technology – Colour data exchange format – Part 1: Relationship to CxF3 (CxF/X), ISO 18619:2015 Image technology colour management – Black point compensation, as well as four technical reports: ISO/TR 12705:2011 Graphic technology – Laboratory test method for chemical ghosting in lithography, ISO/TR 14672:2000 Graphic technology – Statistics of the natural SCID images defined in ISO 12640, ISO/TR 15847:2008 Graphic technology – Graphical symbols for printing press systems and finishing systems, including related auxiliary equipment, and ISO/TR 16066:2003 Graphic technology – Standard object colour spectra database for colour reproduction evaluation (SOCS) were confirmed for the first time. Also, the list of the standards and technical specifications published recently is longer than usual; therefore, only the new ones are described below, while the revised editions are presented in the side column.

ISO 12642-3:2021

Graphic technology – Input data for characterization of 4-colour process printing
Part 3: Extended data set including near neutral scale

A data set defined in this new standard from September 2021 is designed for all general applications, especially those using neutral-scale calibration and CMYK inks, with no required layout or patch size. It is meant as an alternative to the data set provided in ISO 12642-2:2006 (reconfirmed last year), replacing its duplicate patches with the new ink value combinations.

The revised editions of graphic technology ISO standards

Besides the new editions that replaced the previous versions of standards and are briefly introduced in the following text, Amendment 1 to ISO 21632:2018 Graphic technology – Determination of the energy consumption of digital printing devices including transitional and related modes was published in November 2020.

ISO 2834-1:2020

Graphic technology – Laboratory preparation of test prints
Part 1: Paste inks

In contrast to the original edition from 2006, the new version released in November 2020 describes a general procedure for the preparation of well-defined test prints on paper, board, metals, foils and other suitable substrates for the use by several existing as well as future standards. It specifies the instruments required for tests, namely the IGT-type and prüfbau-type printability testers that are electrically driven, the materials and their conditioning, sample preparation and the test procedure. The reference test and ink, as well as roller conditioning and maintenance of elastomer rollers, are described in the annexes.

ISO 2836:2021

Graphic technology – Prints and printing inks – Assessment of resistance of prints to various agents

The fourth edition available since this May replaced the previous one from 2004. With new agents added in the current version, this standard defines the methods to test the interaction of liquid and solid agents, solvents, varnishes and acids with prints on all substrates produced by conventional as well as digital processes. It does not cover food safety and food contact materials.

ISO 12635:2021**Graphic technology – Plates for offset printing – Dimensions**

The third edition of this standard that specifies the width, length and thickness of unprocessed metal lithographic printing plates, and for computer-to-plate applications also their flatness, edge straightness and burr requirements, was published this June and replaced the previous version from 2008. In an effort towards higher standardisation, the current revision defines the preferred (most widely used) plate dimensions.

ISO 12647-8:2021
Graphic technology – Process control for the production of half-tone colour separations, proof and production prints
Part 8: Validation print processes working directly from digital data

Replacing the first edition from 2012, the new one published this May uses ΔE_{00} colour difference formulae, adds a better metric for uniformity assessment and a more content-oriented control wedge, as well as the technical requirements for validation print conformity in a new appendix.

ISO 14298:2021**Graphic technology – Management of security printing processes**

This standard specifies a minimum set of requirements on security printing management system. Compared to the first edition from 2013, the changes in the new edition published this August comprise mainly the updated definitions to comply with the latest ISO/IEC Directives.

ISO/TS 15311-1:2020
Graphic technology – Requirements for printed matter for commercial and industrial production
Part 1: Measurement methods and reporting schema

The second edition from 2019 (see JPMTR Vol. 8, No. 3) was soon replaced by this one published last December. It adds definitions for colour gamut, macroscopic uniformity, perceived resolution, display window indoor light stability, and contouring.

ISO 12647-9:2021
Graphic technology – Process control for the production of half-tone colour separations, proof and production prints
Part 9: Metal decoration printing processes using offset lithography

This new standard from the ISO 12647 series published in June 2001 defines the printing requirements for the metal decoration market based on the colour values of a typical white-coated metal substrate, e.g. for boxes and cans.

ISO 15930-9:2020
Graphic technology – Prepress digital data exchange using PDF
Part 9: Complete exchange of printing data (PDF/X-6) and partial exchange of printing data with external profile reference (PDF/X-6p and PDF/X-6n) using PDF 2.0

Since last November, the PDF/X family of standards has been extended by this new one, defining the use of ISO 32000-2 (PDF 2.0) and supporting Gray, RGB, CMYK and n-colourant characterisation spaces, as well as colour-managed data. In contrast to previous parts, this one allows annotations, including digital signatures, form fields and videos, in the printable area of a page.

ISO 16612-3:2020
Graphic technology – Variable data exchange
Part 3: Using PDF/X-6 (PDF/VT-3)

This new standard for variable data and transactional printing from November 2020 is based on ISO 32000-2 as restricted by ISO 15930-9 (see above).

ISO/TS 18621-21:2020 and ISO/TS 18621-31:2020
Graphic technology – Image quality evaluation methods for printed matter
Part 21: Measurement of 1D distortions of macroscopic uniformity utilizing scanning spectrophotometers
Part 31: Evaluation of the perceived resolution of printing systems with the Contrast-Resolution chart

These two new parts of the ISO/TS 18621 series were published last November and December, respectively. The first one defines evaluation of the horizontal and vertical homogeneity using the Macro-Uniformity-Score; its next edition is now under development. The second one specifies the procedure to characterise the perceived resolution using the dedicated test chart.

ISO 20616-1:2021
Graphic technology – File format for quality control and metadata
Part 1: Print requirements eXchange (PRX)

While the second part of this series was presented in this section a year ago, the first part was published in September 2021. It specifies an extensible file format for the exchange of data and metadata with customer print quality requirements between the relevant applications and systems.

ISO 22934:2021**Graphic technology – Communication of offset ink properties**

The requirements defined in this new standard from May 2021 aim to ensure the properties of inks are appropriate for the intended use of the printed product and facilitate the optimised planning of print production.

Bookshelf

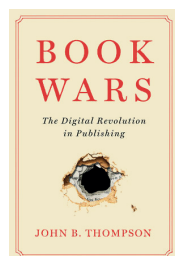
Book Wars

The Digital Revolution in Publishing

This book provides a valuable insight into the digital transition of the oldest of the media industries, the book publishing industry. The text draws on two decades of the study focused on Anglo-American publishing, namely hundreds of in-depth interviews with industry representatives from large trade publishers to small organisations or individuals. While most of the research for this book was done between 2013 and 2019, the author also makes use of some information gathered for his previous two publications – *Books in the Digital Age: The Transformation of Academic and Higher Education Publishing in Britain and the United States* (2005) and *Merchants of Culture* (2009).

The comprehensive text of the current book gives a historical perspective on the changes coming with digitalisation and shows how the modern book publishing industry can absorb and adapt to the digital revolution, stressing the importance of the social context in the adoption of new technologies. It also highlights the upsides, especially many kinds of publishing models and channels that increase the chances of writers to get published and engage with readers. The significant point for the publishing ecosystem is the need to reach out to readers to reduce the dependence on large booksellers and retailers, especially Amazon. Independent booksellers are still able to maintain personal relationships and meet the needs of readers but only on a local level. Overall, the book brings a detailed account of the present book publishing landscape and provokes discussion among all interested in books and their future.

The first three chapters deal with ebooks, analysing in detail their share of total book sales, both overall and for individual genres, exploring new forms of the book made possible through the digital format and the features that differentiate, or may differentiate, ebooks from printed editions, and discussing the copyright issues related to the backlist titles and their digital publishing. Then, two chapters describe the impact of Google and Amazon; while the main concern in the case of Google is copyright and access to the digitised content, in the case of Amazon, it is its dominant position on the market reached through the systematic gathering of customer details exploited in the effective marketing. The next chapter discusses the resulting struggles for visibility. The following three chapters present the options of self-publishing, crowdfunding and BookFlix. The last three chapters before the book's conclusion deal with audiobooks, storytelling in social media and the coexistence of old media with the new ones. In addition, the appendices provide the sales data from a large US trade publisher and an account of research methods and sources. The book includes selected case studies as well as figures and tables based on the available data and information acquired through interviews. While some sources are directly quoted, others are mentioned under pseudonyms or fully anonymised, in accordance with their preferences.



Author: John B. Thompson

Publisher: Polity

1st ed., April 2021

ISBN: 978-1-509-54678-7

526 pages

Hardcover

Available also as an eBook



Light—Science & Magic An Introduction to Photographic Lighting

*Authors: Fil Hunter, Steven Biver,
Paul Fuqua, Robin Reid*

Publisher: Routledge
6th ed., April 2021
ISBN: 978-0367860264
336 pages, 267 images
Hardcover
Also as an eBook



This book helps to understand the nature and principles of light and how to light “any sort of subject in any location or circumstance”. Now in the sixth edition, it explains the concepts of light and lighting, types of reflections, how to control the surface appearance, reveal shape and contour, light metal and glass, set up lights for making portraits, and deal with extreme lighting and scenes. In addition, it discusses the equipment needed when working on location and in the studio, together with the appropriate approaches. It also includes new illustrations and an updated list of reliable suppliers.

Managing 3D Printing Operations Management for Additive Manufacturing

Editor: Daniel Eyers

Publisher:
Palgrave Macmillan
1st ed., March 2020
ISBN: 978-3030233228
208 pages, Hardcover
Also as an eBook

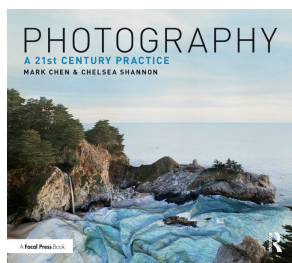


This new book discusses technology adoption models, implementation scenarios and flexibility strategies for 3D printing, its sustainability, spare parts manufacturing, craft production, and a cost-service relationship for on-demand 3D printing. It also presents a new framework for 3D printing implementation with evidence from the industry, the current range of 3D printing services and their provision business models, along with a future outlook on the role of 3D printing in supply chains and circular economy.

Photography A 21st Century Practice

The intention of the authors of this book was to help its readers in becoming photographers who craft powerful images worth to get recognised among myriad other photos taken and posted online every day while also covering all fundamentals necessary to acquire the appropriate technical skills. The content of the textbook is organised into chapters dealing at first with the basics – devices, optics, exposure, composition, light, post-production, and prints, then discussing the significance of content and concept, including craft and composition, as well as development and presentation, and finally presenting the analogue photographic processes, video, computational photography, and also the use of words, which are not a primary means of communication for visual artists but still may strengthen a storytelling potential of photography.

The textbook includes step-by-step demonstrations, numerous hands-on exercises as well as questions to think about and discuss. To illustrate the presented concepts, the volume features works of many outstanding artists, often complemented by the analyses of their approaches and careers to provide more in-depth insight.



Authors: Mark Chen, Chelsea Shannon

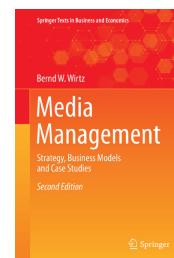
Publisher: Routledge
1st ed., June 2020
ISBN: 978-0-367-55352-4
682 pages, 1 000 images
Hardcover
Available also as an eBook

Media Management Strategy, Business Models and Case Studies

This textbook introduces the main concepts of media management. The author tracks the development of media management, reflecting the development of media and communication applications, outlines the characteristics of media management and value creation systems of media enterprises, describing core assets and competencies as well as business models, and defines functions of media management. Eight chapters detail business models and value creation in the newspaper and magazine market, book market, movie market, TV market, radio market, music market, video and gaming market, and internet market. The text also covers international media management and cross-media management. The last chapter provides the Google/Alphabet case study and eight other market-specific case studies.

Author: Bernd W. Wirtz

Publisher: Springer
2nd ed., September 2020
ISBN: 978-3-030-47912-1
327 pages, 141 images
Hardcover
Available also as an eBook



Ink under the Fingernails **Printing Politics in Nineteenth-Century Mexico**

As the author disclosed in her post on UC Press Blog after publishing this book, she originally intended to study printers as artisans and workers, but her archival research that included government ministry papers, supreme court records and legal files revealed the significant role of printers in liberal state formation in 19th-century Mexico and efforts towards press freedom. Drawing on extensive sources, the book provides a detailed insight into printing shops in the post-independence era with a focus on Mexico City. It discusses censorship, regulations of printing and press confiscations, along with their reflection in public debate, the later shift in official thinking and printing used as a tool of nation-building, as well as commercial expansion of printing. The story is illustrated through archived prints ranging from type specimens to broadsides posted on street walls and preserved as the investigation evidence, also documenting the imagery and typefaces used.



Author: Corinna Zeltsman

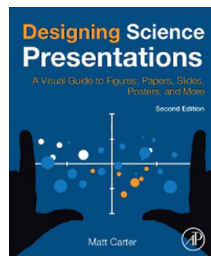
Publisher: University of California Press
1st ed., June 2021
ISBN: 978-0-520-34433-4
350 pages, 37 images
Hardcover
Available also as an eBook

Designing Science Presentations **A Visual Guide to Figures, Papers, Slides, Posters, and More**

This concise guide with clearly organised content and well-chosen illustrations covers all important aspects and good practices worth considering when preparing science presentations. The first part briefly outlines the topic and design goals for different presentation formats. The next one, which comprises about a third of the book, deals with the individual visual elements – colour, typography, words, tables, graphs, diagrams, and photographs. The remaining four parts are focused on written, slide, oral, and poster presentations. Here the author discusses specifics of research articles, review articles and research proposals, various factors influencing the quality of a slide presentation, including its structure, choice of visual elements, slide layout, animations and transitions, delivery of slide presentation and proper use of technology, considerations for different categories of the slide and oral presentations, and finally the composition, visual design and layout of a poster as well as its presentation at a poster session. Further recommendations on literature, software, designing from scratch and using design principles to market oneself can be found in four appendices.

Author: Matt Carter

Publisher: Academic Press
2nd ed., November 2020
ISBN: 978-0-12-815377-2
368 pages
Softcover
Available also as an eBook



The Periodical Press in **Nineteenth-Century Ireland**

Author: Elizabeth Tilley

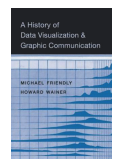


Publisher: Palgrave Macmillan
1st ed., March 2020
ISBN: 978-3030300722
309 pages, Hardcover
Also as an eBook

This work draws on the study of a selection of weekly and monthly periodicals published in 19th-century Ireland. These comprise two titles that appeared in the period of Napoleonic wars and reflect the difficulty to articulate Irish identity in print at that time, two intellectual and two popular titles to examine connections between them, a monthly title published for more than 40 years, a trade journal, selected nationalist periodicals published by James Duffy, and two titles representing the New Journalism at the end of the century. A contemporary account of the Irish publishing industry is provided in the appendix through the excerpts from a series published in one of the examined journals, The Irish Builder, from July 1877 to June 1878.

A History of Data Visualization **and Graphic Communication**

*Authors: Michael Friendly,
Howard Wainer*



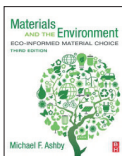
Publisher: Harvard University Press
1st ed., June 2021
ISBN: 978-0674975231
320 pages, Hardcover
Also as an eBook

Ten chapters of this book present the development of data visualisation from the first chart of statistical data back in the middle of the 17th century up to the present dynamic and interactive applications, exploring the different approaches to the graphic representation of various kinds of data and the progress in visualisation tools enabled by the technological advances, as well as the rare cases when visualised data communicate emotions and feelings.

Materials and the Environment Eco-informed Material Choice

Author: Michael Ashby

Publisher: Butterworth-Heinemann
3rd ed., January 2021
ISBN: 978-0128215210
448 pages, Softcover
Also as an eBook



The present thoroughly updated and expanded edition of this book offers a clear account of the topic. First, the author provides the context of the increasing dependence on materials and energy and the rate of resource consumption. Next, he discusses the life cycle and its assessment, as well as the chances to reuse, repair or recycle products and materials and thus reduce waste. One chapter reviews environmental legislation, followed by the visual presentation of the important material attributes, the introduction of eco-audit methods and tools, as well as eco-audit case studies. The remaining chapters consider various aspects of material selection, including supply-chain risk, circular materials economics and sustainability. The relevant curated data for informed selection of materials by engineers and scientists are provided in two appendices.

Synthesis and Applications of Nanocarbons

*Editors: Jean-Charles Arnault,
Dominik Eder*

Publisher: Wiley
1st ed., September 2020
ISBN: 978-1119429388
320 pages
Hardcover
Also as an eBook



This book reviews the progress in nanocarbon research. After an overview of graphite and diamond properties, it deals with fullerenes, spherical carbons, carbon nanotubes, hybrid carbon nanotube fibres, nanodiamonds, nanocarbon aerogels and aerographite, including the optoelectronic properties of nanocarbons and nanocarbon films.

Things Fall Together A Guide to the New Materials Revolution

Skylar Tibbits, the founder of the Self-Assembly Lab at MIT, the Massachusetts Institute of Technology, provides the readers of this book with thought-provoking insights into the emerging research towards the active materials capable to sense, interact, adapt, transform, self-organise, and even evolve. While the development since the Industrial Revolution vastly aimed to restrain materials into standardised components with the lowest possible sensitivity to the changes of the surrounding environment to maximise their stability, the author foresees avenues of new design possibilities through appreciation for material intelligence instead of what he names alienation from materials. New ways of creating material properties are becoming possible thanks to digital fabrication technologies and research advances, especially in synthetic biology and materials science. This book shows how simple materials can be programmed to create active matter on any scale. That is the approach to design smarter products without the extra components, cost, and complexity.

Author: Skylar Tibbits

Publisher: Princeton University Press
1st ed., June 2021
ISBN: 978-0-691-17033-6
224 pages, 42 images
Hardcover
Available also as an eBook



Surface and Interface Science Volume 9: Applications of Surface Science I Volume 10: Applications of Surface Science II

The last two volumes of this comprehensive handbook, which has been published since 2012, cover different application areas of surface science. The topics of their 20 chapters encompass thin films deposited by sputtering and physical vapour deposition methods, wafer bonding, superconformal deposition, spintronics, organic light-emitting diodes and approaches to increase their efficiency, dye-sensitised solar cells, electronic noses (including the inkjet-printed sensors), batteries, and fuel cell research in Volume 9, and surface analytics with X-ray photoelectron spectroscopy and Auger electron spectroscopy, applications of graphene including flexible electronics and 3D printing, catalysis, triboelectric charging including its application in electro-printing, friction, flotation, corrosion, the electrochemical transformation of organic molecules, and self-cleaning superhydrophobic or superomniphobic surfaces in Volume 10.

Editor: Klaus Wandelt

Publisher: Wiley-VCH
1st ed., March 2020
ISBN: 978-3-527-41381-2
941 pages
Hardcover
Available also as an eBook



Bookshelf

Academic dissertations

Improving the Interface Stability of Cross-Linked Films by Ink Formulation in Printed Organic Light Emitting Diodes

The focus of this thesis was on the stability of a cross-linked inkjet-printed layer against subsequent solvent exposure when printing the next layer, which is one of the decisive factors for the successful production of multilayer printed electronics. In particular, the studies were aimed at cross-linking efficiency and polymer–solvent interaction in solution in the case of materials used in the production of OLED devices.

After providing the necessary theoretical background through a concise overview of organic light-emitting diodes, inkjet printing of thin films and polymer solutions used as inkjet inks, the dissertation introduces the investigated system along with materials and methods for its production and characterisation. The main studied hole-transport material comprised a random copolymer containing triarylamine units, in part carrying the styrene moiety as a cross-linker; the version without the cross-linkable groups was studied as well. Five solvents were chosen to have surface tension and boiling point in a range suitable for inkjet printing, while their chemical structures varied extensively in polarity. Two chapters then detail the characterisation of the resulting polymer solutions in terms of the affinity between polymer and solvent, the polymer size in solution, and the process of polymer cross-linking in bulk material as well as a thin film. The last experimental chapter deals with the inkjet printing of cross-linkable hole-transport layer in uni- and bipolar OLED devices and the influence of the hole-transport ink on their performance in terms of electrical and optical properties and lifetime. Besides the solvent used for the hole-transport layer and emissive layer inks, the influence of annealing temperature is also discussed. Although the work studied only the organic light-emitting diodes, the presented comprehensive approach and the findings are relevant for the research of multilayer semiconductor devices in general.

Doctoral thesis – Summary

Author:

Pauline Hibon

Speciality field:

Materials Science

Supervisors:

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Defended:

11 September 2020, Technical University of Darmstadt, Material Science Faculty Darmstadt, Germany

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Further reading:

DOI: 10.25534/tuprints-00014138

Custom Inks and Printing Processes for Electronic Biosensing Devices

This thesis from the field of printed electronics deals with innovations in electronic ink formulation and printing towards personalised, comfortable, and easy-to-use printed point-of-care sensors. Attention is paid especially to the compatibility with delicate substrates to enable skin integration while minimising cost and environmental impact. The approach is based on the use of aerosol-jet printing as a method to deposit nanomaterials with the desired properties under the required conditions.

This dissertation provides the background on the methods and materials relevant to biosensors and printed electronics, describing the current trends and stating the current limitations. Notably, there is a need for cost reduction and form-factor metrics improvement in the case of medical tools for at-home diagnostics. Printing is one avenue to address these concerns because versatile printing equipment can enable multi-material printing at a large scale. In development of biologically compatible inks, multiple factors must be considered: intrinsic properties and post-processing must be optimised

Doctoral thesis – Summary

Author:

Nicholas Xavier Williams

Speciality field:

Materials Science

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Aaron D. Franklin

Defended:

29 April 2021, Duke University, Department of Electrical and Computer Engineering Durham, North Carolina, USA

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and environmental impact must be minimised. The experimental work is presented in four chapters. The first of them describes the development and characterisation of silver-nanowire inks for direct deposition onto living tissue at room temperature, achieving high conductivities and ability to bend without degrading the printed layer. The functionality was demonstrated by printing a conductive trace onto a finger to power the light-emitting diode even when the finger is bent. Next, the possibility to use aerosol-jet printing of biological inks via ultrasonic delivery was verified by fabricating highly sensitive biosensors for carcinoembryonic antigen. In addition, the co-printing of biological and electronic inks was demonstrated. Further work, aimed towards fully printed and all-carbon recyclable electronics, used dielectric crystalline nanocellulose, semiconducting carbon nanotubes and conducting graphene inks to fabricate thin-film transistors, which showed stable performance over several months. It was also possible to prepare functional transistors printed with carbon nanotubes and graphene inks reclaimed using ultrasonic recycling. The same approach was applied to fabricate two types of lactate sensors. Finally, a fully printed, handheld biosensing device for the measurement of blood clot time was demonstrated, including a custom-designed, handheld control system with a 3D-printed case.

Further reading:
<https://hdl.handle.net/10161/23049>

Doctoral thesis – Summary

Author:
Kai Lankinen

Speciality field:
Engineering Sciences

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Further reading:
<http://urn.fi/URN:ISBN:978-952-03-2027-0>

Evaluation of Expanded Gamut Printing in Flexography

This thesis deals with multicolour printing in solvent-based, wide-web flexography. The idea of expanded-gamut printing is not new and is increasingly discussed in the graphic arts industry as a solution that could improve the efficiency and sustainability in a reproduction of brand colours, especially in packaging printing. However, its implementation is slow, in part due to the lack of scholarly studies and reliable experimental evidence. Therefore, the thesis aimed to provide the data and test results to facilitate the transition.

The first chapter of the dissertation overviews packaging printing, colour theory and management, the factors affecting the quality of flexographic printing, with emphasis on colour systems and screens used, standardisation limitations and sustainability in flexography. The second chapter provides the experimental details. It introduces a novel calculator to estimate the efficiency of expanded-gamut printing in terms of the achievable benefits along with the tests used for verification and three designs for print tests, which comprised the reference profile test chart, gang-run job, and a legacy job with spot colours transformed for multicolour process printing. The third chapter presents and discusses the results obtained for expanded-gamut printing efficiency calculations and test designs, including image quality. Also, it briefly mentions the resulting opportunities for standardisation and sustainability. The main conclusion is that the calculations show great potential for efficiency increase and cost savings in several areas. Besides the press setup and downtime, improvements can be achieved through savings on the inks and ink storage, substrate and washing solvent regeneration. Further, linking the calculations with Overall Equipment Effectiveness, OEE, shows a potential improvement of 42–85 % and total yearly cost savings of about 0.6–1.3 million EUR per printing press. Similarly, the CO₂ equivalent can be reduced by 34–51 %. Regarding the colour gamut, the studied 7-colour system covers up to 91 % of the Pantone Color Matching System with ΔE_{2000} of less than 3. Moreover, high-pigmented 4-colour inks expanded the colour gamut by 14 %. Additional benefits can be achieved in the case of gang-run printing. Finally, the possibility of a real-world implementation of expanded-gamut printing was demonstrated for the legacy job, with keeping the quality acceptable to the brand owner.

Events

Fall Conference 2021

Frisco, Texas, USA
3–6 October 2021



This event of the Flexographic Technical Association is held again as the live conference, with an on-demand option. The sessions cover the future outlook for flexography, standardisation, workflow improvements, and other innovations.

Printing for Fabrication 2021

<https://www.imaging.org>
11–13 October 2021



This year's edition, for the second time organised as an online event, opens a keynote by Yury Gogotsi dealing with MXene inks and possibilities of their applications for printed electronics. The presentation covers synthesis and properties of MXenes, i.e. 2D transition metal carbides and nitrides, as well as both aqueous and organic MXene ink formulations, together with examples of their use for extrusion printing, inkjet printing and screen printing on various substrates. The second keynote by Kye-Si Kwon is focused on direct-to-shape printing on non-flat surfaces, discussing the methods capable to apply high-viscosity inks to various geometries, including near-field electrospinning, continuous inkjet and needle-type dispensers. The conference programme features lectures and group discussions on deposition technology, circular economy of paper, experimental printing, system integration, direct-to-shape printing, and the impact of Covid-19 in the field.

Attendees have access also to the International Conference on Advanced Imaging 2021 held online a week earlier (3–8 October). For both conferences, the particular dates and times differ according to timezone, with the recordings available later for at least four months.

NAPIM Fall Technical Conference 2021



Oak Brook, Illinois, USA
12–14 October 2021

This conference organised by the National Association of Printing Ink Manufacturers aims to deliver current and accurate information on the issues important for the graphic arts industry. Its 2021 edition features presentations dealing with sustainability, communicating colour using digital colour standards, innovations in wax additive technology, quality control, chemicals risk evaluations and other relevant legislation, developments in UV LED technology, printed electronics, and more. The pre-conference course offered on the morning of the first day covers principles of printing ink formulation, milling and grinding operations, testing and technical support.

Cautious optimism reflected in the calendar of events

After the long months, the situation seems to be more stable with part of the events successfully taking place in person and the others mostly planned in advance to be held in the virtual format. However, some changes due to COVID-19 still occur, often as a result of uncertainties and their impact on attendance. The events cancelled for these reasons include the PRINTING United Expo 2021, with the new dates set to 19–21 October 2022 in Las Vegas, Nevada, USA, and this year's edition of the Paper & Plastics Recycling Conference, instead of which the organisers offer a webinar series on 20–21 & 26–27 October 2021.

Absolute Flexo Future 2021

Halmstad, Sweden
6–7 October 2021



This event offered by the Sweflex and Dansk Flexo Forum associations

presents the outlook for flexographic technology, discussing the current challenges and recent developments.

CIDAG 6th International Conference on Design and Graphic Arts

<http://www.cidag.com.pt>
20–22 October 2021



Held online, the sixth edition of this biannual

event features a three-day programme with four keynote speakers, a round-table discussion and presentations that are this time dedicated to sustainable and green design, employing the appropriate methods, materials and printing processes.

Print Next 2021

Stockholm, Sweden
28 October 2021



The third edition of this Nordic event is organised by the network Grafskom, the Swedish Printing Federation (Grafiska Företagen) and the Nordic Offset Printing Association. The topics cover society changes after COVID-19 with impacts on marketing and advertising, business and economic issues, as well as approaches to increase sustainability and implement automation and robotisation.

WAN-IFRA Events



The World Association of News Publishers offers in the last months of this year both virtual and in-person events. After the second online edition of the World Printers Summit on 13–14 October 2021, the European Printers Summit takes place in Frankfurt, Germany, on 26–27 October and the Indian Printers Summit in Chennai, India, on 17–18 November. The 2021 editions of the World News Media Congress (29 November to 2 December), Print Innovation Awards (11 November) and Digital Media Awards Worldwide (2 December) are held virtually.

The online courses organised across the world include the WAN-IFRA Journalism Programme: Challenge of the Climate Crisis for the Asia Pacific and South Asia regions supported by Temasek Foundation (16 September to 28 October 2021) and two programmes for news publishing executives supported by the Facebook journalism project: the LATAM Newsroom & Business Transformation Program 2021 (from 2 September to 16 December) and the Digital News Innovation Programme – Subscription Bootcamp for India (from 1 October 2021 to 1 January 2022), which combine webinars and coaching sessions.

RadTech Europe 2021



<https://www.radtech-europe.com>
19–20 October 2021

The 2021 edition of this established conference and exhibition on radiation curing is held online. Participants can use the virtual platform also after the event to access recordings or continue conversations. In the two-day schedule, two tracks are reserved for technical presentations. Their topics on Tuesday include recyclable packaging options in the session focused on sustainability, an overview of current legislation together with its impact on curable acrylates and printing inks in the session on health, safety and environment, and progress in excimer curing and material properties tailoring, as well as the related studies, e.g. on double bond conversion, dose rate effects and dielectric performance, in two sessions reviewing application developments. The sessions on Wednesday are dedicated to advances in 3D printing utilising UV curing, the chemistry of photopolymerisation, raw materials, inks and graphic arts, diagnostic and measurement equipment, and radiation sources. In the third track, the first end-user session deals with various aspects of LED technology, including considerations for its implementation and process control, chemistry and future outlook, while the second one is focused on circular economy. In addition, the programme of the first day offers the fourth track with courses covering value chain, applications and end products, handling and storage of raw materials, radiation curing chemistry, formulation, ultraviolet lamps and light-emitting diodes, electron-beam technology, manufacturing equipment and conditions.

Book Conference 2021



Frankfurt, Germany
21 October 2021

Chapter 2 of the event Shaping the Future with Books, which is organised by Intergraf and supported by Smithers, takes place at the Frankfurt Book Fair. The schedule offers talks discussing the book market trends, the regulatory framework for printing and publishing in the EU, omnichannel retail, changes in book production and production on demand, including the Gutenberg One book-making robot, the OECD's data on reading habits of 15-year-olds around the world, consumer behaviour perspective on printed and digital books, publishers' perspective, and environmental challenges in the book industry. Chapter 1 that took place as a webinar on 11 February 2021 is available for replay at the Intergraf website.

American Printing History Association's 46th Annual Conference



<https://printinghistory.org>
22–23 October 2021

This year's volume entitled 'Impresos: Printing Across Latin American and Caribbean Cultures' has a focus on the study of printing history and practices in said regions. It is hosted online through the Grolier Club of New York, America's oldest and largest society for bibliophiles and enthusiasts in the graphic arts. The conference programme begins with the panel exploring Latin America in print through four case studies, which analyse the production of the Pedro Craesbeeck press in Lisbon in the early 17th century,

the Arco do Cego venture translating and publishing agro-industrial texts sponsored by the Portuguese government in the years around 1800, the first printing press in Trinidad and the circulation of Trinidadian seditious printings in Venezuela during the Age of the Atlantic Revolutions, and the networks and publishing strategies of activist printers in 19th-century Mexico (see also the related book of Corinna Zeltsman in the Bookshelf section). Keynotes are scheduled in the late afternoon of each day: ‘Typefaces as Cultural Objects’ by Juan Villanueva, presenting a collection of typefaces and letterforms illustrating Latin American visual landscape and identity on Friday, and ‘La Impresora’ by Nicole Cecilia Delgado, introducing the Puerto Rican poetry press and risograph print shop on Saturday. Other contributions deal with the history of local typefounding in Spanish America, digital collections of historical prints, bilingual writing in artists’ books, and the work of selected printers and presses in this region.

European Graphic Arts Hackathon 2021

<https://www.vigc.be>
25–26 October 2021



This creative event is organised by VIGC – the Flemish Innovation Center for Graphic Communication, Ernst & Young, Intergraf and Sappi to facilitate team collaboration in developing highly targeted and innovative solutions addressing the challenges in commercial printing, packaging, labels, marketing, industrial printing, and publishing. The time limit for teams of up to five people, assisted by experts and coaches, is set to 24 hours.

CIC29 – 29th Color and Imaging Conference

<https://www.imaging.org>
1–5 November 2021



For the second year in a row, also this event organised by IS&T, the Society for Imaging Science and Technology, is held online. Recordings from the event can be accessed also later, until at least 15 March 2022. Short courses take place live in October. The new courses deal with the assessment of image quality and preference, colour science implications of modern display technologies, deep learning for colour applications, tools for digitising a motion picture film, a quantum-relativistic theory of the space of perceived colours and its applications to colorimetry, uniform colour spaces, and fundamentals of translucency perception. The courses on colour gamut mapping and colour imaging with compact camera optics are updated. The keynotes feature Andy Goris revealing some challenges in developing the sensor array for the HoloLens augmented-reality computer, Carol Payne, Matthias Schaf-tenberg and Nick Shaw presenting a scene-referred gamut compression in the Academy Color Encoding System (ACES), an open-source colour management framework, and Jean-François Lalonde showing approaches to estimate lighting from a single image and achieve photo-realistic results when combining virtual and real visual elements. The technical sessions include lectures on colour printing on pre-coloured textiles, the threshold of colour inconstancy, chromatic contrast sensitivity modelling, spectral-reflectance estimation under multiple light sources, and many more. In addition, three workshops are scheduled during the conference week.

Smithers Events for Printing and Packaging



At the end of this year, the events organised by Smithers are announced to be held either in the hybrid or in-person format. The latter include the 2021 editions of two conferences in the USA – SmartPack, the event covering progress in active and intelligent packaging, in Chicago, Illinois (1–2 November), and Specialty Papers in Milwaukee, Wisconsin (1–3 November), as well as two packaging conferences taking place in Europe – Sustainability in Packaging in Barcelona, Spain (2–4 November) and Digital Print for Packaging in Amsterdam, Netherlands (8–9 December).

39th CIP4 InterOp Meeting

Bruges, Belgium
15–19 November 2021

Focus topics of this meeting of CIP4 members, held for the first time since the COVID-19 pandemic has started and hosted by Dataline, are security issues in the cloud, JDF Integration Matrix and Conventional Printing ICS.

Digitalization in Packaging

<https://www.aipia.info>
16 November 2021



This congress held online by the Active & Intelligent Packaging Industry Association is focused on smart packaging solutions for digitalisation, supply chain and sustainability. The topics covered by presentations running in two or three tracks and complemented with online discussions include, among others, smart engraving used instead of printing to reduce ink consumption, printed active labels for the quality control of the packaged food to minimise its waste, and innovative item-level digital identities utilising digital watermarking technology and advanced inkjet printing.

The Holography Conference

<https://holographyconference.com>
17–18 November 2021

This global conference, held as an online event for the second time, offers talks on product authentication through hologram validation using computer-vision mobile technology, methods to create depth within holographic space, and more.



Warsaw Pack

Warsaw, Poland
23–25 November 2021

This fair showcases packaging techniques, packaging, labels, labelling and printing, automation, e-commerce, logistics, and storage. On the first day, visitors and exhibitors can attend the first edition of the Trends and Innovations in Packaging conference for free.



Labelexpo Asia 2021

Shanghai, China
7–10 December 2021

This event for the label and package printing industry in the Asian-Pacific region is part of the Labelexpo Global Series held by the Tarsus Group together with the Labels & Labeling magazine.



**LABELXPO
ASIA 2021**

Gulf Print & Pack 2021

Dubai, UAE
14–16 December 2021

This trade show for the Middle East and North Africa is also held by the Tarsus Group. The topics of expert sessions offered for free during all three days cover automation and workflow, continuous improvement and lean manufacturing, product diversification, and more.



**GULF PRINT
& PACK 2021**

Paper & Beyond 2021

<https://www.paperandbeyond.eu>
17–18 November 2021



After the successful virtual edition held for the first time a year ago, this annual event organised by the Confederation of European Paper Industries can be joined online also in 2021. The announced topics cover paper recycling and circularity, identified pathways to carbon neutrality, strategies for the more sustainable production and its financing, jobs in the paper industry, the new European forest strategy, the role of wood fibres in textiles of the future, and more. In addition, presentations by Blue Sky Young Researchers & Innovation Awards laureates are scheduled for the second day.

Industrial Print Integration Conference 2021

I*P* Düsseldorf, Germany
23–24 November 2021

This is the new event of ESMA, the European Specialist Printing Manufacturers Association. With a proven format comprising the two-day two-track conference complemented with a tabletop exhibition, the event aims to introduce new manufacturing possibilities using the screen, inkjet and other printing processes to industry partners and facilitate knowledge transfer. Besides the technological topics, which include advanced industrial printing, industrial print precision, modular print components, industry 4.0 integration, high-level automation, and integration with robotics, the conference covers also optimisation of energy consumption, reduction of emissions and waste, and sustainable alternatives to non-print processes among the environmental topics, as well as the business-related concepts, such as on-demand and low-cost production, customisation, personalisation, near-shoring and future business models.

The 2021 programme features the keynotes 'Printed electronics: Enabling the next generation of digital solutions' by Stijn Gillesse and 'Perovskite solar cells and modules upscaling towards industrialisation via meniscus coating techniques' by Yinghuan Kuang, with two more yet to be announced. Other presentations discuss the role of printing technologies, especially inkjet, in waste reduction in the production of electronic devices, upscaling challenges, such as realistic targets for jetting functional fluids in production, software compensation of print defects, inkjet printing integration using artificial intelligence, technology developments – from printing materials, ink formulation, surface pretreatment and ink degassing, to imaging, printing, UV LED curing and NIR drying equipment, up to combining printing and other production processes into hybrid machines and lines, emerging applications enabled by printed electronics, the direct-to-shape printing enabling both visual and haptic decoration, inks and processes to produce customised water-slide decals, case studies showing approaches to inkjet printing applications in the packaging and decoration industries, and more.

In addition, a special session is scheduled for 24 November with eight presentations discussing the experiences and functional prototypes resulting from the Paperonics project, joined in the past three years by 40 partners to explore the possibilities of efficient, affordable and sustainable printing of electronic components directly on paper and plastics substrates.