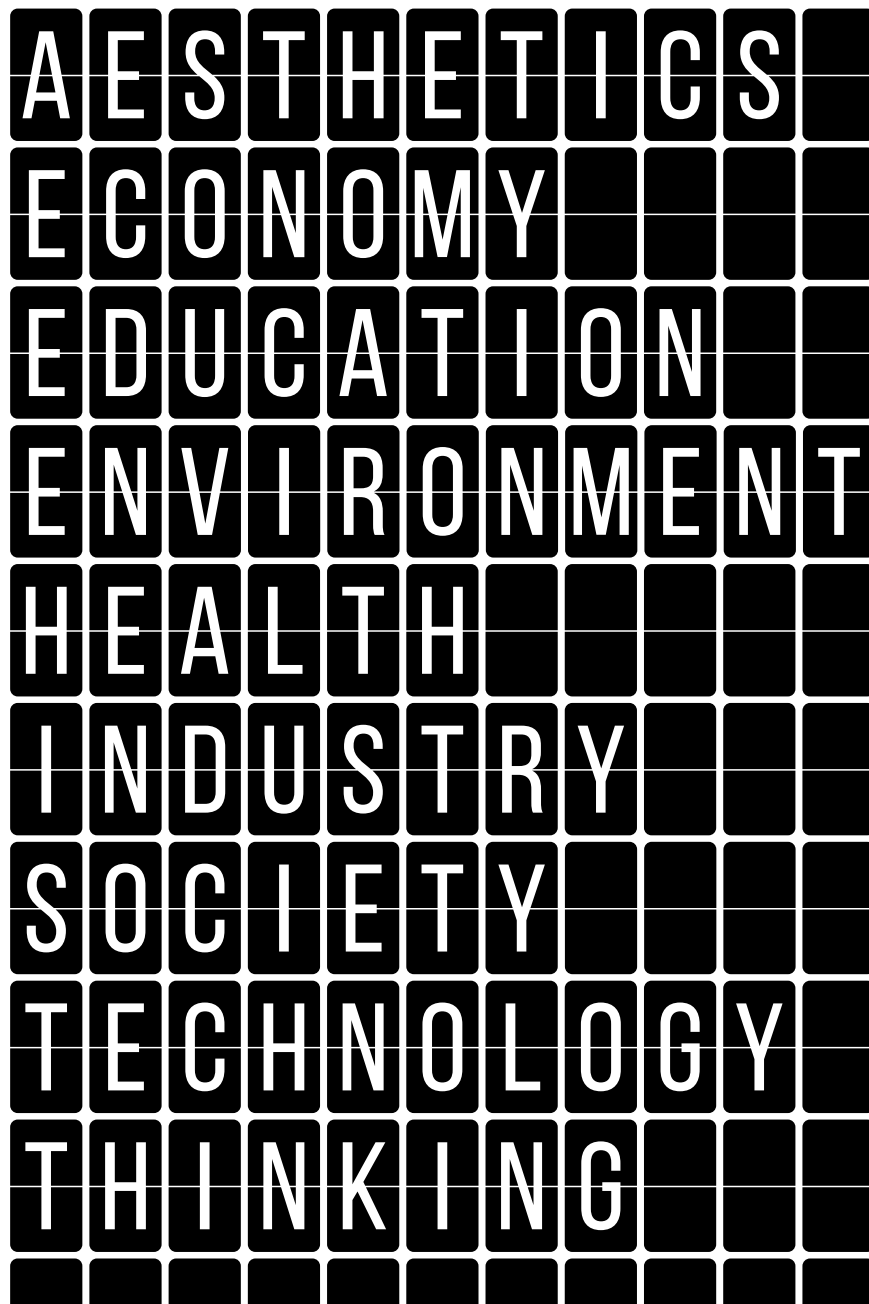


DESIGN FOR NEXT

Proceedings of the 12th
European Academy of Design Conference.
Sapienza University of Rome, 12-14 April 2017
supplement of The Design Journal

edited by
Loredana Di Lucchio, Lorenzo Imbesi, Paul Atkinson

designfornext.org



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edited by

Loredana Di Lucchio,

Lorenzo Imbesi,

Paul Atkinson

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Contents

EDITORIAL

SV	Conference track contents
SXXV	Foreword <i>Paul Atkinson</i>
SXXVI	Introduction: Designing a Design Conference <i>Loredana Di Lucchio, Lorenzo Imbesi</i>
SXXVIII	Keynote speakers
SXXIX	About
SXXX	People
SXXXII	Conference Tracks & Track Chairs
S1	Design for Next Challenges <i>Loredana Di Lucchio</i>
S9	Design for Next Design <i>Lorenzo Imbesi</i>

CONFERENCE TRACK CONTRIBUTIONS

S16	Design for Next Aesthetics
S411	Design for Next Economy
S732	Design for Next Education
S1558	Design for Next Environment
S1978	Design for Next Health
S2592	Design for Next Industry
S2858	Design for Next Society
S3643	Design for Next Technology
S4171	Design for Next Thinking
S4671	Workshops
S4726	Posters

Conference Track contributions

DESIGN FOR NEXT AESTHETICS

- S16 **A Framework For Product Design Based On Semantic Attribution Process** *Itsaso Gonzalez, Este Val, Daniel Justel, Ion Iriarte*
- S28 **A Semiotic Rosetta Stone: Developing a Designer-centric Meta-language of Pragmatic Semiotics** *Dave Wood*
- S38 **Aesthetic Justice. Design for a blind-spot culture**
Peter Buwert
- S49 **Aesthetics in Design Semiotics Research. Developing foundations to better comprehend cultural habits and codes in bottom-up design processes** *Felipe Domingues, Salvatore Zingale, Dijon De Moraes*
- S63 **Aesthetics of futures. Shaping shared visions of tomorrow**
Manuela Celi, Elena Formia
- S77 **An Art-based research laboratory translated into a Critical Design strategy**
Raphaële Bidault-Waddington
- S89 **Beautiful interfaces. From user experience to user interface design**
Letizia Bollini
- S102 **Building networks for knowledge exchange, and design strategies for climate futures.**
Henry Mainsah, Andrew Morrison, Håkan Edeholt
- S110 **Can Timelessness through Prototypicality Support Sustainability? A Strategy for Product Designers** *Rachel Flood Heaton, Deana McDonagh*
- S122 **Contested Surfaces. Aesthetics of Colonization for Urban Coexistence**
Adriana Cuéllar, Marcel Sanchez Prieto
- S134 **Creative Interpretation in Web Design Experience**
Johanna Silvennoinen, Rebekah Rousi, Laura Mononen
- S146 **Design fiction, culture and climate change. Weaving together personas, collaboration and fabulous futures** *Andrew Morrison, Alittea Chisin*
- S160 **Design for Next... Year. The Challenge of Designing for Material Change**
Ben Bridgens, Debra Lilley
- S172 **Entropy: Unpacking the form through post digital making**
Evelina Kourteva, Dermott Mc Meel
- S184 **Exploring aesthetics through digital jewellery**
Maarten Versteeg, Johanna Kint
- S196 **Future Aesthetics of Technology; context specific theories from design and philosophy of technology** *Wouter Eggink, Jeroen Snippert*
- S209 **House and Yacht: the Aesthetics of the Interior as a Link between Different Sectors**
Mariateresa Campolongo
- S219 **Living on the Edge: design artefacts as boundary objects**
Michael Pierre Johnson, Jen Ballie, Tine Thorup, Elizabeth Brooks
- S236 **"Make it beautiful". An old request with difficult academic answers**
Silvia D. Ferraris, Lucia Rampino, Venere Ferraro
- S249 **Metamorphosis of design. The aesthetics of the dark side** *Francesca La Rocca, Chiara Scarpitti*

- S261 **Metaphorical spaces. The art used by designers to explore, experiment and express concepts of Interiors** *Raffaella Trocchianesi, Matteo Pirola*
- S273 **Micronarratives as the form of contemporary communication**
Simona Venditti, Francesca Piredda, Walter Mattana
- S283 **Network Time Where it Counts. Temporality and Critical Approaches to Infrastructure**
Tom Schofield, Gabriella Arrigoni
- S294 **Reimagining cinema: searching for an aesthetic of interaction design through cinema**
Nicolas Marechal, Joel Karamath
- S304 **Returning the aesthetics to the heart of the design process. On the conflict between social design and product beauty** *Mario de Liguori*
- S317 **Self-organized matter: design and primitive future of the eidetic categories**
Fabrizio Gay, Irene Cazzaro
- S332 **Semiotics and design: Towards an aesthetics of the artificial**
Matthew Holt
- S342 **Smart Solutions, “Smart Aesthetics”?**
Anna Cecilia Russo, Marinella Ferrara
- S354 **The Aesthetics of The Artificial – Critical Design’s Lost Dominion**
John Knight
- S365 **The design of surfaces, between empathy and new figuration**
Spartaco Paris
- S375 **The New Aesthetic of DIY-Materials**
Camilo Ayala-Garcia, Valentina Rognoli
- S390 **Who’s in charge? End-users challenge graphic designers’ intuition through visual verbal co-design** *Simone Taffe*
- S401 **Wrapping Cultural Values: using Social Embodiment as Stimulus in Designs**
Lizette Reitsma, Elise van den Hoven

DESIGN FOR NEXT ECONOMY

- S411 **Adding plus value to development aid projects through design strategy: experiences from Pakistan** *Gwendolyn Kulick*
- S424 **Beyond customer satisfaction. Supporting organisational change through Service Design. A case study in the insurance industry** *Ion Iriarte, Alazne Alberdi, Elisabeth Urrutia, Daniel Justel*
- S435 **Big Data: Understanding how Creative Organisations Create and Sustain their Networks**
Fraser Bruce, Jackie Malcolm, Shaleph O’Neill
- S444 **Co-creating finances. A new perspective on designing for the financial world.**
Santiago de Francisco Vela
- S457 **Design and Academic Entrepreneurship. The Role of Design in Spin-off Processes**
Anna Sinell, Franziska Brodack, Sebastian Deneff
- S469 **Design and design management in the incubation phase of high-tech start-ups**
Claudia Acklin, Andres Wanner
- S479 **Design-driven innovation: Making meaning for whom?**
Heleen de Goey, Per Hilletoft, Lars Eriksson
- S492 **Designing for the next (Circular) Economy. An appeal to renew the Curricula of Design Schools** *Michael Leube, Dominik Walcher*

- S502 **Discussing a New Direction for Design Management through a New Design Management Audit Framework** *Fulden Topaloğlu, Özlem Er*
- S522 **Hacking the organization: Organizational Transformation by Design**
Hans Kaspar Hugentobler
- S531 **Involving stakeholders towards service implementation. Co-designing change of practices using a visual language** *Tim Overkamp, Freya Ruijs*
- S550 **Materiality Matters: Exploring the use of design tools in innovation workshops with the craft and creative sector in the Northern Isles of Scotland** *Cara Broadley, Katherine Champion, Lynn-Sayers McHattie*
- S566 **New Design Thinking Tools for the Next Generation of Designer-Entrepreneurs**
Sara Colombo, Cabirio Cautela, Lucia Rampino
- S581 **Raising new opportunities for the Next Economy by exploring variable user needs for Computational Co-Design** *Viktor Malakuczi*
- S589 **Rethinking the Fashion Collection as a Design Strategic Tool in a Circular Economy**
Ulla Ræbilda, Anne Louise Bang
- S600 **Service Design as a Cultural Intermediary. Translating cultural phenomena into services**
Claire Dennington
- S614 **Service design as the ground for alternative social and economic scenarios**
Maria Antonietta Sbordone, Nicola Morelli
- S622 **Setting-up a Design Factory within a Creative Science Park @Aveiro Region**
Teresa Franqueira, Cátia Pereira, Raul Pinto, Gonçalo Gomes
- S635 **The choice of design. From businesses' conditions to businesses' attitudes**
Mariana Fonseca Braga
- S647 **The Commodity of Trade in Contemporary Design**
Giovanni Innella, Paul Anthony Rodgers
- S669 **THE FUTURE OF DESIGN SUPPORT: What Can We Learn From Design Support Experience in the UK, Estonia and Turkey?** *Melehat Nil Gulari, Ruth-Helene Melioranski, Ozlem Erc, Chris Fremantle*
- S681 **The Value of Agile Methods in Designing for Behavioural Change: A Case Study** *Dirk Ploos van Amstel, Martine Heemskerk, Reint Jan Renes, Sander Hermsen*
- S691 **The Value of Design in Innovation: results from a survey within the UK Industry** *Ricardo J Hernandez, Rachel Cooper, Bruce Tether, Emma Murphy*
- S705 **Universities' experience with brand. The role of design in managing university communication and branding.** *Veronica Dal Buono, Fulvio Fortezza*
- S721 **Why do I love you Vaatelainaamo? Analysis of motivations, barriers and opportunities in a Finnish service for sharing clothes** *Rosana Aparecida Vasques, Mikko Korja, Maria Cecilia Loschiavo dos Santos*

DESIGN FOR NEXT EDUCATION

- S732 **A contemporary didactics of innovation in product design. Grip Factors identification and evaluation** *Marco Mancini*
- S745 **A conversation with material**
Nicolai de Gier
- S754 **A Design Thinking approach to introduce entrepreneurship education in European school curricula** *Ester Val, Itsaso Gonzalez, Ion Iriarte, Amaia Beitia, Ganix Lasa, Maite Elkoro*

- S767 **A design-relevant mindfulness device**
Fernando Rojas, Stuart English, Robert Young, Nicholas Spencer
- S781 **A dialogical model for studio critiques in Design Education**
Gaia Scagnetti
- S792 **A Future Scenario for a Methodological Approach applied to PhD Design Research. Development of an Analytical Canvas** *Violeta Clemente , Katja Tschimmel, Fátima Pombo*
- S803 **A Multilevel Approach for Social Transformations and its Implications on Service Design Education.** *Nicola Morelli, Amalia De Götzen*
- S814 **Advanced Design as a paradigm for design education: learning systems within its platforms and practices** *Roberto Iñiguez Flores, Ruth León Morán*
- S822 **Algorithmic Futures. The Analog Beginnings of Advanced Parametric Design in First Year Studios** *Patrick Sean Rhodes*
- S835 **An Interdisciplinary Design Education Framework**
Hye-Jin Nae
- S848 **Best Practices in Design Education Leads to a New Curriculum**
Ana Thudichum Vasconcelos
- S859 **Creative puzzlement: how deconstructing elements of object facilitates industrial design student's imagination** *Neil Smith, Shiro Inoue, Nick Spencer, Andy Tennant*
- S875 **Culture as a design “next”: Theoretical frameworks to guide new design, development, and research of learning environments** *Tutaleni I. Asino, Lisa A. Giacumo, Victoria Chen*
- S886 **Dealing with wicked problems, in messy contexts, through prototyping**
Bo Westerlund, Katarina Wetter-Edman
- S900 **Design as a process tool of collaborative and multidisciplinary learning in society**
João Bernarda, Ana M. Ferreira, Carlos Silva, Inês Queiroz
- S915 **Design Culture in school. Experiences of design workshops with children**
Fabrizio Pierandrei, Elena Marengoni
- S927 **Design for social change and design education: Social challenges versus teacher-centred pedagogies** *Nicos Souleles*
- S937 **Design for Social Sustainability. An educational approach for insular communities**
Valentina Vezzani, Susana Gonzaga
- S952 **Design ResearchScape. A visual exploration of Design Research publications**
Stefano Perna
- S964 **Design Thinking for Textiles: let's make it meaningful** *Louise Valentine, Jen Ballie, Joanna Bletcher, Sara Robertson, Frances Stevenson*
- S977 **Design Thinking: A New Road Map In Business Education**
Gözde Çeviker-Çınar, Gökhan Mura, Melike Demirbağ-Kaplan
- S988 **Designing a cultural event as an inclusive educational activity**
Davide Fassi, Agnese Rebaglio, Annalinda De Rosa
- S1000 **Designing Design Education. An articulated programme of collective open design activities**
Luisa Collina, Laura Galluzzo, Stefano Maffei, Vanessa Monna
- S1014 **Designing more responsible behaviours through Design Education: Reflections on a Brazilian pilot experience in Social Innovation for Sustainability** *Viviane G. A. Nunes*
- S1026 **E-LEARNING AND DESIGN PRACTICE. Tools and methods for professional learning of strategic design approach** *Arianna Vignati, Luca Fois, Michele Melazzini, Xue Pei, Francesco Zurlo*

- S1037 **Facebook as a Boundary Object in Industrial Design Studio. A SoTL Study**
Işıl Oygür, Selen Devrim Ülkebaş
- S1048 **Flourishing in graphic design education: incorporating Ubuntu as a curricular strategy.**
K.A. Chmela-Jones
- S1058 **From a master of crafts to a facilitator of innovation. How the increasing importance of creative collaboration requires new ways of teaching design.** *Andrea Augsten, Moritz Gekeler*
- S1072 **Getting Creative Again. Getting Creative Again**
Josiena Gotzsch
- S1080 **Human and Technological Dimensions of Making in FabLab**
Iván Sánchez Milara, Georgi V. Georgiev, Jukka Riekkö, Jani Ylioja, Mikko Pyykkönen
- S1093 **Ikebana: A Collaborative Design Pedagogy**
Rachel Kelly
- S1106 **Infusing management education with design to foster resilience, adaptability and flexibility** *Noemi Sadowska, Lorna Dallas-Conte*
- S1118 **Interrogating Futures in Industrial Design Education**
Saliha Türkmenoğlu Berkan, Özlem Er, Wolfgang Jonas
- S1130 **Is Design a Plus? A dilemma of disciplines when implementing design into academic education** *Søren Bolvig Poulsen, Peter Vistisen, Sune Klok Gudiksen*
- S1140 **Learning Architectural Design. Material and Immaterial Aspects.**
Gerlinde Verhaeghe
- S1154 **Making Sense: Harnessing Communication through Prototyping**
Giovanni Innella, Paul A. Rodgers
- S1167 **Material Tinkering. An inspirational approach for experiential learning and envisioning in product design education** *Stefano Parisi, Valentina Rognoli, Marieke Sonneveld*
- S1185 **Materials & Manufacturing Methods selection in product design: Experiences in undergraduate programs** *Aline Souza, Rita Almendra, Lia Krucken*
- S1197 **On Context, Concepts and Research: An Approach in Basic Design**
Dilek Akbulut, Hatice Kesdi
- S1212 **On The Teachers Role in Interactive Prototyping**
Jussi Mikkonen
- S1224 **PBL 2.0. Interdisciplinary, multicultural transformative sustainable education for design students** *Elad Persov, Roshni Udyavar Yehuda, Ruti Kantor, Barak Pelman*
- S1241 **Preparing design students for the market: an initial investigation on the required knowledge and skills for graphic designers in Brazil** *Paulo Roberto Nicoletti Dziobczenski, Anamaria Amaral Rezende Galeotti*
- S1250 **Reconstructing the critique. Using inclusive formative feedback in face-to-face and online communities of practice to improve knowledge acquisition in design education**
Lucia Miceli, Lynette Zeeng
- S1260 **Reflexive Practices for the Future of Design Education: An Exercise in Ethno-Empathy**
Manu J. Brueggemann, Angelika Strohmayer, Matthew Marshall, Nataly Birbeck, Vanessa Thomas
- S1270 **Rethinking the Design Studio-Centered Architectural Education. A Case Study at Schools of Architecture in Turkey** *Burkay Pasin*
- S1285 **Rethinking the education of retail design. What are the competences a retail designer needs in this fast evolving discipline?** *Katelijan Quartier, Stephanie Claes, Jan Vanrie*
- S1293 **Semiotics in Design Education. Semiotics by Design** *Michela Deni, Salvatore Zingale*

- S1304 **Service Design pedagogy and effective student engagement: Generative Tools and Methods** *Hena Ali, Silvia Grimaldi, Monica Biagioli*
- S1323 **'Sketching' the new designers - going wide, going deep and doing it together**
Rita Assoreira Almendra, Gonalo Falco
- S1336 **Systemic Design, from the content to the structure of education: new educational model.**
Chiara Battistoni, Silvia Barbero
- S1355 **Systemic Food Design.it A website that narrates food supply chains from a systemic perspective** *Franco Fassio*
- S1367 **The Anatomy of a Multi-Sensory Design Course: Happy Sound Object**
Yasemin Soylu, Berrak Karaca algamciođlu, Pelin Efilti, Oki Kasajim
- S1380 **The design brief: inquiry into the starting point in a learning journey**
Noemi Sadowska, Dominic Laffy
- S1390 **The Digital Corbeled Wall. A Pedagogical Approach to Digital Infrastructure and Traditional Craft** *James Stevens, Ayodh Kamath, Komal Sharma*
- S1405 **The end of the "briefing" and "the client" in graphic design.**
Gonalo Falco, Rita Almendra
- S1415 **The Reflection of Experiential Knowledge Into Professional Practice: Case of Industrial Design Education** *Enver Tatlisu, ıđdem Kaya*
- S1430 **The street as teaching space. A case study**
Paul Woodruffe, Mandy Patmore
- S1448 **Theoretical studies and practical tools for a systemic design educational paradigm. Applications of Systems Thinking principles to design education** *Laura Dominici*
- S1459 **Towards a University Design School. Restoring the value of tacit knowledge through assessment** *Lynne Whelan, Carmel Maher, Colin Deevy*
- S1471 **Using Design Methods to Improve Design Quality: Verbalizers vs Visualizers**
Younjoon Lee, Jaewoo Joo
- S1485 **Vulnerable children as change-agents within their communities: an educational methodology co-designed in Namibia** *Valentina Salvi*
- S1503 **Wearable Words: A case study applying Jewellery theory and practice to the education of Fine Art, Textiles Innovation and Design, Graphic Communication and Illustration students**
Roberta Bernabei
- S1511 **What students say about their work and what it says about their work. Toward the development of rhetorical practice in the educational design studio**
Myra Thiessen, Veronika Kelly
- S1521 **What's Next in Design Education? Transforming role of a designer and its implications in preparing youth for an ambiguous and volatile future** *Ramneek Kaur Majithia*
- S1530 **Why a Logbook? A backpack journey as a metaphor for product design education**
Violeta Clemente, Katja Tschimmel, Rui Vieira
- S1543 **World design. Educational approach for a new experience of sharing.**
Maria Antonietta Sbordone, Rosanna Veneziano

DESIGN FOR NEXT ENVIRONMENT

- S1558 **A second life for Contemporary Ruins. Temporary Adaptive Reuse strategies of Interior Design to reinterpret vacant spaces** *Barbara Camocini, Oxana Nosova*
- S1566 **An Integral Design Framework —designing a global village**
Fenja Sepers
- S1580 **Architecture for Regenerating Living Ecosystems: Designing a clay module for a vaulted dome structure** *Miruna Sladescu, Caitilin de Bérigny, Glen Hill*
- S1596 **Bioplastics made from upcycled food waste. Prospects for their use in the field of design**
Cecilia Cecchini
- S1611 **Circular Material Library. An Innovative Tool to Design Circular Economy**
Maarit Virtanen, Kati Manskinen, Sauli Eerola
- S1620 **Circular Product Design. A Multiple Loops Life Cycle Design Approach for the Circular Economy** *Ana Mestre, Tim Cooper*
- S1636 **Climate Change. Design Teaching for a New Reality**
Paul Micklethwaite, Robert Knifton
- S1651 **Creating 21st Century Global Citizens. A design-led systems approach to transformative secondary education for sustainability** *Nikolas Winter-Simat, Natalie Wright, Jaz Hee-jeong Choi*
- S1662 **Creating a Tool for Measuring the Social Value of Design**
Jea Hoo Naa, Youngok Choi, Andrew Walters, Busayawan Lam, Stephen Green
- S1673 **Data Visualization Collection. How graphical representation can inspect and communicate sustainability through Systemic Design** *Barbara Stabellini, Chiara L. Remondino, Paolo Tamborrini*
- S1682 **DEMOCRATIC CARDBOARD. Materials and design for a sustainable society**
Davide Turrini
- S1692 **Design for Leftovers. From Food Waste to Social Responsibility**
Marco Bozzola, Doriana Dal Palù, Claudia De Giorgi
- S1705 **Design for social sustainability. A reflection on the role of the physical realm in facilitating community co-design.** *Mirian Calvo, Annalinda De Rosa*
- S1725 **Design Process and Sustainability. Method and Tools**
Marco Marseglia
- S1738 **Designing material interaction to promote water saving. An exploration of sensory language** *Sara Bergamaschi, Lucia Rampino*
- S1751 **Designing on the Spot: Learning from the Social Design Projects in Gökçeada/Imbros Island** *Alayça Erözçelik, Burak Taşdizen*
- S1765 **Energy Performance Development of Non-regulated Retrofit Mass Housing Estates in Northern Cyprus** *Bertug Ozarisoy, Hasim Altan*
- S1782 **Envisioning the future of public lighting with citizens for upcoming technologies**
Olli Heiskanen, Karthikeya Acharya
- S1794 **From Science to Design: the Design4Materials virtuous cycle**
Rossana Carullo, Cecilia Cecchini, Marinella Ferrara, Carla Langella, Sabrina Lucibello
- S1807 **GreenTeam. A new educative approach to sustainable design**
Andrea Di Salvo, Silvia Barbero, Andrea Gaiardo, Giada Rivella
- S1817 **'I Believe in That Version of the Future'. Cli-Fi and Design Fictions as Dialogical Frameworks for Expert Engagements** *Lizette Reitsma, Stina Wessman, Elin Önevall*
- S1827 **Information design as a tool for promoting renewable energy**
Susanna Vanhamäki, Antti Heinonen, Kati Manskinen, Mirja Kälviäinen

- S1836 **Make the environment the (Next) Economy**
Vanessa Monna
- S1852 **Material Resignification in the Amazon. A way to construct sustainability scenarios**
Fernanda Sarmento, Monica Moura
- S1869 **Pocket Park: Product Urban design**
Francesco Armato
- S1879 **REPEAT – Textile Design for PV Modules! Design-driven Strategies for Photovoltaic Modules** *Tina Moor, Brigitt Egloff, Tina Tomovic, Stephen Wittkopf*
- S1894 **Resilient Design: Mitigating Trepidation About Environmental Disasters**
Tonya Sweet, Catherine Caudwell
- S1904 **Rethinking Water: A CAAS (City As A Spaceship) design approach**
Susan Fairburn, Barbara Imhof, Susmita Mohanty
- S1916 **Shifting Conversations for Sustainability Transitions Using Participatory Design Visioning**
A. İdil Gaziulusoy, Chris Ryan
- S1927 **Space4Inspiration: Survival Lab. Designing Countermeasures for Natural Disasters**
Annalisa Dominoni, Benedetto Quaquaro, Susan Fairburn
- S1938 **Sustainable Design Futures: An open design vision for the circular economy in fashion and textiles** *Paul Smith, Jen Baille, Lynn-Sayers McHattie*
- S1948 **Sustainable Design: Circular Economy in Fashion and Textiles**
Debbie Moorhouse, Danielle Moorhouse,
- S1960 **The Speedcycle: a design-led framework for fast and slow circular fashion lifecycles**
Kate Goldsworthy
- S1971 **VEG-HIVE. An easy to grow veg-kit for urban farmers**
Erminia D'Itria, Loredana Di Lucchio

DESIGN FOR NEXT HEALTH

- S1978 **A Healthcare Wearable for Chronic Pain Management. Design of a Smart Glove for Rheumatoid Arthritis** *Gozde Goncu-Berk, Nese Topcuoglu*
- S1989 **A Multidisciplinary inspection of Dental Photography: What Do Dentist Think and What Can Designer Do?** *Yener Altiparmakogullari, Muhsin Cifter, Abdusselam Selami Cifter*
- S1998 **A Review on Future Directions in Hospital Spatial Designs with a Focus on Patient Experience** *Abdusselam Selami Cifter, Muhsin Cifter*
- S2010 **Co-designing co-design. Shifting the culture of practice in healthcare**
Paul Chamberlain, Rebecca Partridge
- S2022 **Design and Disability. Developing New Opportunities for the Design Curriculum**
Emma Gieben-Gamal, Sónia Matos
- S2033 **Design and Usability of the Next Medical Devices for the Home Care**
Francesca Tosi, Alessandra Rinaldi
- S2044 **Design Experiments. Identifying areas for intervention and designing medical technology for adolescents and young adults with type 1 diabetes** *Gillian M. McCarthy, Edgar R. Rodríguez Ramírez, Brian J. Robinson*
- S2057 **Design facilitators' journeys through the jungle of Co- in healthcare**
Remko van der Lugt, Tanja van der Laan
- S2068 **DESIGN FOR DUCHENNE. Guidelines for dwellings' construction or renovation for Muscular Dystrophy-Affected Families** *Michele Marchi, Giuseppe Mincolelli*

- S2078 **Design for Dysphagia: a new hardware-and-software mobile system to monitor patients' swallowing** *Niccolò Casiddu, Claudia Porfirione*
- S2090 **Design for the ambient assisted living**
Giuseppe Losco, Andrea Lupacchini, Luca Bradini, Davide Paciotti
- S2109 **Design of non-speech sounds for human interaction. A conjunction between industrial design and psychology** *Eduardo Tapia Olmos*
- S2120 **Design probes and toolkits for healthcare: Identifying information needs in African communities through service design** *Ralitsa D. Debrah, Retha de la Harpe, Mugendi K. M'Rithaa*
- S2135 **Design research for the development of a Medical Emergency Ambulance. Design as a symbolic qualifier in the design of complex systems/products** *Augusto de Sousa Coelho, Vasco Branco*
- S2158 **Designing Care. How Design can improve medical products for a therapeutic wellbeing**
Angela Giambattista
- S2168 **Designing for Aesthetic Disruption: Altering Mental Models in Social Systems through Designerly Practices** *Josina Vink, Katarina Wetter-Edman, Manuela Aguirre*
- S2178 **Designing for an ageing society: products and services**
Silvia Pericu
- S2190 **Designing Industrial Design in the Highly Regulated Medical Device Development Process. Defining our valuable contribution towards usability** *MaryBeth Privitera*
- S2207 **Designing Interactive Music Systems with and for People with Dementia**
Alexander Müller-Rakow, Rahel Flechtner
- S2215 **Designing Schools for Students on the Spectrum** *Ulrike Altenmüller-Lewis*
- S2230 **Designing Therapeutic Support for the People with Alzheimer's disease. A designerly way of Investigation** *Beril Imamogullari, Alessandro Biamonti*
- S2238 **Designing with Dignity: Social determinants of health and design research**
Diana Nicholas, Kiera Townsend, Yvonne Michael
- S2247 **Discovering Service Variations through Service Prototyping**
Vanessa Rodrigues, Stefan Holmlid
- S2258 **Emerging Trends and the Way Forward in Design in Healthcare: An Expert's Perspective**
Emmanuel Tsekleves, Rachel Cooper
- S2273 **Enhancing co-responsibility for patient engagement**
Ineke Neutelings, Pierre Levy, Tom Djajadiningrat, Caroline Hummels
- S2284 **Environment as non pharmacological intervention in the care of Alzheimer's disease** *Silvia Maria Gramegna, Alessandro Biamonti*
- S2293 **Health Co-Creation in Social Innovation: Design Service for Health-Empowered Society in China** *Liang Yin, Davide Fassi, Hang Cheng, Han Han, Shushu He*
- S2304 **Health Design: Mapping current situations, envisioning next steps**
Guillermina Noël
- S2315 **How can constraint-induced movement therapy for stroke patients be incorporated into the design of a tangible interface?The case study of the 'Biggest Hit'**
Mailin Lemke, Edgar Rodríguez Ramírez, Brian Robinson
- S2336 **Imagined futures: designing future environments for the care of older people**
Claire Craig
- S2348 **Improving the Pelvic Exam Experience: A Human-Centered Design Study**
Gina A Taylor, Deana McDonagh, Michael J Hansen

- S2363 **Improving the Visualisation of Renal Blood Test Results to Enhance Patient – Clinician Communication** *Adrian Gradinar, Jeremy Davenport, Heather Hill, Paul Coulton*
- S2375 **Incremental and Radical Innovation: Design in Robotics for Autism. Teo and Riby robots. Evolutionary Development** *Maximiliano Romero, Andrea Bonarini, Andrea Brivio, Ksenia Rogacheva*
- S2389 **Informing hospital design through research on patient experience**
Margo Annemans, Liesbeth Stam, Jorgos Coenen, Ann Heylighen
- S2397 **Limited use only. How can the design of an everyday object help chronic stroke patients to overcome the learned nonuse of the upper limb?** *Mailin Lemke, Edgar Rodríguez Ramírez, Brian Robinson*
- S2418 **Multisensory design of pocket gardens for reducing stress and improving well-being, performance and satisfaction** *Noemi Bitterman, Ella Simonov*
- S2426 **Participant Observation in Cognitive Gameplay as a Rehabilitation Tool for Living Alone Elderly with Dementia in Hong Kong: A Pilot Study** *Alex Pui-yuk King, Kin Wai Michael Siu*
- S2439 **Persuasive Technology as key to increase Working Health Condition. The Case study of a Wearable System to prevent Respiratory Disease** *Venere Ferraro, Mila Stepanovic, Silvia Ferraris*
- S2451 **SAM - Simulation Airways Models**
Elisabetta Cianfanelli, Lorenzo Corbetta, Gabriele Goretti, Lorenzo Pelosini, Maria Luisa Malpelo
- S2463 **Sense and movement. Design of a system for sensorimotor rehabilitation after stroke.**
Francesca Toso
- S2473 **Systemic Design for Sustainable Healthcare**
Silvia Barbero, Agnese Pallaro
- S2486 **Systemic innovation in sustainable design of medical devices**
Silvia Barbero, Amina Pereno, Paolo Tamborrini
- S2498 **The Effectiveness of Environmental Design for Physical Activities Promotion: Review**
Aline Gonzalez-Moreno, Aldo Valencia-Hernandez, Omar Valencia-Hernandez
- S2524 **The fuzzy front-end and the forgotten back-end: User involvement in later development phases** *Frida Almqvist*
- S2534 **User-Designed Dementia Care Pathways. A disruptive approach to mapping dementia support services** *Daniel Carey, Andy Tennant, Paul Rodgers, Katie Dodd*
- S2551 **Wayfinding for health seeking: Exploring how hospital wayfinding can employ communication design to improve the outpatient experience**
Eden Jayne Short, Stephen Reay, Peter Gilderdale
- S2569 **Well Connected. What does design offer in the complexity of blood donation management** *Tine Thorup, Jen Ballie, Marjan Angoshtari*
- S2580 **Will smart homes improve our lives? A design perspective towards effective wellbeing at home** *Margherita Pillan, Sara Colombo*

DESIGN FOR NEXT INDUSTRY

- S2592 **A Design perspective for IoT products. A case study of the Design of a Smart Product and a Smart Company following a crowdfunding campaign.**
Ilaria Vitali, Venanzio Arquilla, Umberto Tolino
- S2605 **Changing roles. Role theoretical approach to customer involvement in industrial service development** *Sanna Peltonen*

- S2616 **Design Absorption and Learning Processes: a study on designers' perceptions about companies.** *Ivna Ravello, Fabiane Wolff, Andréa Capra*
- S2625 **Design and the Fourth Industrial Revolution. Dangers and opportunities for a mutating discipline.** *Tomás García Ferrari*
- S2634 **Design for Next Connected Appliances**
Eleonora Fiore, Paolo Tamborrini, Silvia Barbero
- S2645 **Designing Fast & Slow. Exploring fashion textile product lifecycle speeds with industry designers** *Rebecca Earley*
- S2657 **Digital Maker Networks. Benefits, barriers and opportunities for re-localised UK manufacturing for the future** *Paul Smith*
- S2667 **Emotional service experience toolkit for servitization**
Miia Lammi
- S2679 **Fashion Design for Short Male Consumers**
Osmud Rahman, Henry Navarro
- S2689 **Footwear design. The paradox of "tailored shoe" in the contemporary digital manufacturing systems** *Annalisa Di Roma*
- S2700 **Go with the Flow: Accelerated digital design in the age of Post-agility**
John Knight
- S2716 **Hospital of Objects. Recycling plastic from the small electronic devices to redesign old objects by the 3d printers** *Chiara Petruzzi, Loredana Di Lucchio, Lorenzo Maria Cafiero, Riccardo Tuffi, Alessio Ubertini, Flavio Caretto*
- S2724 **Industry 4.0, Innovation and Design. A new approach for ergonomic analysis in manufacturing system** *Elena Laudante*
- S2735 **Industry 4.0: Is It Time for Interaction Design Craftsmanship?**
Daniela Petrelli
- S2746 **Networked production and outsourced design. A comparison of three case studies**
Silvia Gasparotto
- S2760 **New vision on Knitwear design. How the traditional craft methodologies are evolving into fashion international scenarios.** *Laura Affinito, Giovanni Maria Conti, Martina Motta*
- S2771 **Next generation of tools for industry to evaluate the user emotional perception: the biometric-based multimethod tools** *Ganix Lasa, Daniel Justel, Itsaso Gonzalez, Ion Iriarte, Ester Val*
- S2778 **Scenarios for design and craft** *Manuel Martínez Torán, Chele Esteve Sendra, Ricardo Moreno Cuesta*
- S2789 **Strategic innovation tools enabling nautical stakeholders to shape a next level port**
Garnt Nieuwsma, Ingrid Mulder
- S2803 **The Relation of Influence between Leadership Style and Team Creativity of Integrated Design Companie** *Yueh Hsiu Giffen Cheng, Teng-Jung Wang*
- S2813 **The Role of Design Concepts in the Development of Digitalized Industrial Services**
Janne Pekkala, Salu Ylirisku
- S2823 **The understanding and use of design in the UK industry: reflecting on the future of design and designing in industry and beyond** *Ricardo J Hernandez, Rachel Cooper, Jeyon Jung*
- S2837 **What does Product Design Mean Tomorrow? Example Middle East**
Andreas Sicklinger
- S2846 **Why the Internet of Things needs Object Orientated Ontology**
Joseph Lindley, Paul Coulton, Rachel Cooper

DESIGN FOR NEXT SOCIETY

- S2858 **Anamorphosis and Contemporaneity**
Tommaso Empler
- S2873 **Built territories. Innovative regeneration processes for a participatory and sustainable design** *Marco Borsotti, Sonia Pistidda, Giuletta Fassino*
- S2883 **Call of Survival: Stigmergy for Matters of Concern**
Shanu Sharma, Koumudi Patil
- S2894 **Con[temporary]. Design for social innovation**
Chiara Olivastrì
- S2906 **Containers of Stories: using co-design and digital augmentation to empower the museum community and create novel experiences of heritage at a house museum**
Caroline Claisse, Luigina Cioffi, Daniela Petrelli
- S2919 **Craft and Sustainability: Potential for Design Intervention in Crafts in the Yangtze River Delta, China** *Xiaofang Zhan, Stuart Walker, Ricardo Hernandez-Pardo, Martyn Evans*
- S2935 **Crafting Sustainable Futures. The Value of the Service Designer in Activating Meaningful Social Innovation from within Textile Artisan Communities**
Francesco Mazzarella, Val Mitchell, Carolina Escobar-Tello
- S2951 **Decentralising Design. Raising the Question of Agency in Emerging Design Practice**
Paola Pierri
- S2960 **Design and Innovation in Brazil. Reflections on a local experience within the furniture industry sector** *Viviane G. A. Nunes*
- S2973 **Design by means of citizen activism: three cases illustrated by the action of Coletivo Maré, Rio de Janeiro, Brazil** *Bruna Montuori, Marcos Rosa, Maria Cecilia Santos*
- S2991 **Design for Grassroots Production in Eastern Turkey through the Revival of Traditional Handicrafts** *Hazal Gumus Ciftci, Stuart Walker*
- S3005 **Design for social enterprises. Co-designing an organizational and cultural change**
Daniela Selloni, Marta Corubolo
- S3020 **Design for Society: Analysis of the adoption of Design practices by Early-Stage Social Entrepreneurs** *David Pérez, David Hands, Edward McKeever*
- S3035 **Design for Socio-technical Innovation: A Proposed Model to Design the Change**
Pablo Marcel de Arruda Torres
- S3047 **Design for Territories as Practice and Theoretical Field of Study**
Marina Parente, Carla Sedini
- S3059 **Design Paradox. The next chapter in the design process**
Daria Ayvazova
- S3068 **Designing for the next generation. Children urban design as a strategic method to improve the future in the cities** *Laura Girdali, Elisabetta Benelli, Roberta Vita, Isabella Patti, Jurji Filieri, Francesca Filippi*
- S3079 **Designing local food systems in everyday life through service design strategies**
Emily Ballantyne-Brodie, Ida Telalbasic
- S3096 **Designing Trust: the importance of relationships in social contexts**
Dr Laura Warwick
- S3106 **Digital commons, urban struggles and the role of Design**
Andreas Unteidig, Blanca Domínguez Cobreros, Elizabeth Calderon-Lüning, Gesche Joost

- S3121 **Engaged by Design: The Role of Emerging Collaborative Infrastructures for Social Development. Roma Makers as A Case Study** *Alessandra Fasoli, Silvio Tassinari*
- S3134 **Enhancing textile enterprises for a more sustainable society, through design research and website development** *Disaya Chudasri, Krittiya Saksrisathapor*
- S3152 **Fab Labs. New hubs for socialization and innovation**
Annalisa Di Roma, Vincenzo Minenna, Alessandra Scarcelli
- S3162 **Fair by design. Addressing the paradox of inclusive design approaches**
Matteo Bianchin, Ann Heylighen
- S3171 **Framing Design to support Social Innovation: The Open4Citizens Project** *Nicola Morelli, Marc Aguilar, Grazia Concilio, Amalia De Götzen, Ingrid Mulder, Janice Pedersen, Louise Klitgaard Torntoft*
- S3185 **Freedome smart mobile office-home. The bio-logic design adaptation to the dynamic evolution of living** *Serena Fiorelli*
- S3202 **From Cork Labour Activities to Co-design Production. Azaruja Case Study**
António Gorgel Pinto, Paula Reaes Pinto
- S3213 **Future Tense: Alternative Futures as a Design Method for Sustainability Transitions**
Corina Angheloiu, Goldie Chaudhuri, Leila Sheldrick
- S3226 **Harmonics: Towards Enlightened Evaluation**
Katherine Champion, George Jaramillo
- S3238 **Having a voice, having a choice: Children’s Participation in Educational Space Design**
Eda Can, Göksenin İnalhan
- S3252 **Human movement in Public spaces: The use and development of motion-oriented design strategies** *Liselotte Vroman, Thierry Lagrange*
- S3262 **Information Design for Supporting Collaborative Communities**
María de los Angeles Briones
- S3279 **Infrastructuring Place. Citizen-led Placemaking and the Commons**
Maria Frangos, Thomas Garvey, Irena Knezevic
- S3294 **Libraries of Things as a new form of sharing. Pushing the Sharing Economy**
Najine Ameli
- S3305 **Living mobility transitions towards bicycling. Designing practices through co-creation and socially influencing systems** *Tobias Barnes Hofmeister, Agnis Stibe*
- S3317 **Makers’ ambitions to do socially valuable things**
Elisabeth Unterfrauner, Christian Voigt
- S3326 **Making Visible: Valuating the Impacts of Design Intervention for Social Cooperative** *Xue Pei, Francesco Zurlò, Arianna Vignati, Luca Fois, Michele Melazzini*
- S3340 **Masters of Cerimonies. A design approach to participatory video**
Francesca Piredda, Elisa Bertolotti, Simona Venditti
- S3354 **No Man is an Island. Situated Design Research and Wicked Impact**
Jeroen Peeters, Nigel Papworth, Pernilla Glaser, Carla Collevocchio, Ana Betancour, Ambra Trotto
- S3368 **Participatory Design for Public Services. Innovation in Public Administration**
Gianni Sinni
- S3380 **People’s Republic of Bolzano or how digital artifacts can be adversarial to misinformation**
Matteo Moretti, Maurizio Teli, Antonella De Angeli
- S3393 **Places, Communities and Knowledge. You’ll be part of an upcoming exhibition**
Alfredo Calosci
- S3401 **Providing Fast Flowing Calm Waters. The role of the Design Manager in mid-large scale Public Sector Co-Design Projects** *Gemma Coupe, Leon Cruickshank*

- S3413 **REAGENTE. A label for social innovation.**
Raffaella Fagnoni, Silvia Pericu, Chiara Olivastri
- S3425 **Research on Service Blueprint of Food Banks**
Pin Hsuan Kuang, Wen Hui Chou
- S3436 **Sacred design. Immaterial values, material culture**
Luisa Chimenz
- S3448 **Sharing Economy for Tourism and Hospitality: new ways of living and new trends in interior design** *Luisa Collina, Laura Galluzzo, Giulia Gerosa, Maddalena Bellè, Maria Lidia Maiorino*
- S3464 **Social Design for Service. Building a Framework for Designers Working in the Development Context** *Essi Kuure, Satu Miettinen*
- S3475 **Socially Engaged Transmedia Practice. Three Co-Creative Interventions in Portuguese Neighbourhoods** *António Gorgel Pinto*
- S3486 **Storytelling in design for social innovation and politics: a reading through the lenses of Hannah Arendt** *Virginia Tassinari, Francesca Piredda, Elisa Bertolotti*
- S3496 **Systemic Design approach in policy-making for sustainable territorial development**
Silvia Barbero, Miriam Bicocca
- S3507 **Tackling local problems by embedding design in local administrative offices: A case study of the 'Design Consultant' program** *Eun Ji Cho*
- S3516 **THE CHALLENGE OF BEING ACTIVIST-DESIGNER. An attempt to understand the New Role of Designer in the Social change based on current experiences** *Maziar Rezai, Mitra Khazaei*
- S3536 **The emerging challenge of brand design and brand management in social innovations**
Tamami Komatsu Cipriani
- S3546 **The growth of digital social innovation in Europe. An Open Design approach to support innovation for the societal good** *Serena Cangiano, Zoe Romano, Matteo Loglio*
- S3560 **The Museum of the Future: a sedimentary cloud**
Craig Bremner, Laura Bernadet
- S3569 **The role of design in supporting the continual emergence of hybrid spaces of interaction within the city** *Valentina Volpi, Antonio Opromolla*
- S3578 **The Social Purpose of Design Activity**
Xuesong Wu
- S3589 **Towards a new "urban sensitivity". The role of design as support to social innovation**
Barbara Di Prete, Martina Mazzarello
- S3601 **Unearth Hidden Assets through Community Co-design and Co-production**
Busayawan Lam, Theodore Zamenopoulos, Mihaela Kelemen, Jea Hoo Na
- S3611 **UTOPIA_an Italian way to practice transdisciplinarity. Educating alterity**
Valentina Frosini
- S3620 **Working with young people at the margins of society to design hybrid physical/digital objects to portray their experiences of support services** *Daniel Burnett, Paul Coulton*
- S3630 **You say you want a revolution? Non-normative foundations of Transformation Design**
Peter Friedrich Stephan

DESIGN FOR NEXT TECHNOLOGY

- S3643 **A data-driven approach for understanding Open Design. Mapping social interactions in collaborative processes on GitHub** *Massimo Menichinelli*
- S3659 **A Framework for Capturing Creativity in Digital Fabrication**
Georgi V. Georgiev, Iván Sánchez Milara, Denzil Ferreira
- S3669 **A Heuristic for Improving Transmedia Exhibition Experience**
Vashanth Selvadurai, Claus Andreas Foss Rosenstand
- S3683 **A study of the relationship between personalised 3D printed ‘Souvenirs of Place’ and public perception of modern architectural heritage.** *Samantha Forster, Katherina Vones, Constantia Anastasiadou*
- S3696 **Adopting the Unknown through the Known Supporting user interaction of non-idiomatic technologies in exhibitions through known idioms of conventional technologies**
Peter Vistisen, Claus Pertou Østergaard, Rameshnath Kala Krishnasamy
- S3707 **:Blackbox: A Design Fiction research project**
Alfonso Tiberio, Lorenzo Imbesi
- S3713 **Collaboration and exchange between “Craftsman” and “Designer”:** Symbiosis towards Product Innovation. *Handan Temeltaş*
- S3724 **Conceptualising Kinaesthesia – Making Movement Palpable**
Lise Amy Hansen, Wendy Keay-Bright, Damian Milton
- S3735 **Crafting the Digital: Developing expression and materiality within digital design and manufacture** *David Grimshaw*
- S3749 **Design and Planned Obsolescence. Theories and Approaches for Designing Enabling Technologies.** *Matteo Zallio, Damon Berry*
- S3762 **Design problem analysis and process. A case of technology-augmented problem decomposition in analysis and understanding of public space** *Awoniyi Stephen*
- S3776 **Design Thinking Applied to Data Storage Innovation: A Case Study**
Maliheh Ghajargar, Giulio Mangano, Alberto De Marco, Roberta Giannantonio
- S3789 **Designing The “Next” Smart Objects Together With Children**
Seçil Uğur Yavuz, Nitzan Cohen, Roberta Bonetti
- S3801 **Designing the Next Generation of Connected Devices in the Era of Artificial Intelligence**
Alexander Schurig, Colin George Thomas
- S3811 **DIY: polar fleece as a new material for handmade artefacts.**
Beatrice Lerma
- S3824 **Effect of Digital Age on the Transmission of Cultural Values in Product Design**
Betül Aybala Çakmakçioğlu
- S3837 **Empathy Workshop: When Project team and Pilot Users Exchange Experiences**
Maliheh Ghajargar, Lucia Longo, Eleonora Gargiulo, Roberta Giannantonio
- S3849 **Fiction and Physicality: a designerly approach towards complexities of emerging technologies** *Yeup Hur, Miriam Sturdee, Migeul Bruns Alonso, Panos Markopoulos, Jason Alexander*
- S3863 **Flying with data: Openness, forms and understanding.**
Nick Dulake, Ian Gwilt
- S3873 **From Design for One to Open-ended Design. Experiments on understanding how to open-up contextual design solutions** *Francesca Ostuzzi, Lieven De Couvreur, Jan Detand, Jelle Saldien*
- S3884 **From respect to change user behaviour. Research on how to design a next generation of smart home objects from User Experience and Interaction Design** *Yichen Wu, Margherita Pillan*

- S3899 **Humans, Machines and the Design Process. Exploring the Role of Computation in the Early Phases of Creation** *Philippa Mothersill, V. Michael Bove Jr.*
- S3914 **Interaction design applications for museum spaces. New exhibit paths driven by a Bluetooth sensor's system** *Claudio Germak, Sara Khan*
- S3925 **Interaction design for cultural heritage. A robotic cultural game for visiting the museum's inaccessible areas.** *Germak Claudio, Giuliano Luca, Lupetti Maria Luce*
- S3935 **Interface and Data Biopolitics in the Age of Hyperconnectivity. Implications for Design** *Salvatore Iaconesi*
- S3945 **Jamming as a design approach. Power of jamming for creative iteration** *A. Tece Bayrak*
- S3954 **Lifelogging in User Experience Research: Supporting Recall and Improving Data Richness** *Mattias Arvola, Johan Blomkvist, Fredrik Wahlman*
- S3966 **Making and Unfinishedness: Designing Toolkits for Negotiation** *Michael Smyth, Ingi Helgason*
- S3975 **Museum Experience Design: A Modern Storytelling Methodology** *Federica Dal Falco, Stavros Vassos*
- S3984 **My Boy Builds Coffins** *Gianni Denaro, Lorenzo Imbesi*
- S3996 **Research through provocation: a structured prototyping tool using interaction attributes of time, space and information.** *Jaime Rivera, Tom MacTavish*
- S4009 **Rethinking the Role of Design within the Technological Advancements in Biomimetics and SynBio** *Toufic Haidamous*
- S4019 **Silk Road: A Reference. Creating public architectural intervention in the context of education & technology.** *Marcus M. Farr*
- S4038 **Speculating the Possibilities for Remote Collaborative Design Research. The Experimentations of a Drawing Robot** *Catherine Normoyle, Rebecca Tegtmeyer*
- S4052 **Technological Research and Invention In The Industrial Design** *Mario Buono, Sonia Capece*
- S4065 **Textile Connections E-textiles to enhance connectedness for older adults experiencing loneliness** *Sara Nevay, Christopher S.C. Lim, Gary Gowans*
- S4076 **The cocktail party effect. An inclusive vision of conversational interactions** *Isabella Loddo, Dario Martini*
- S4087 **The future of print design relies on interaction** *Marco Neves*
- S4101 **The Map As An Object of Service Design** *Qian Sun, Hyunyim Park*
- S4120 **'The Robots are Coming!': Perennial problems with technological progress** *Paul Atkinson*
- S4132 **TXD. From Traceability to Experience Design in Fashion Accessories Production.** *Elisabetta Cianfanelli, Gabriele Goretti*
- S4146 **Using Design Fiction to Inform Shape-Changing Interface Design and Use** *Miriam Sturdee, Paul Coulton, Jason Alexander*
- S4158 **When Your Toaster is a Client, how do you design? Going Beyond Human Centred Design** *Leon Cruickshank, Nina Trivedi*

DESIGN FOR NEXT THINKING

- S4171 **A case of values conflict in the video game design field. A critique of Schön's appreciative system.** *Laureline Chiapello*
- S4183 **Adaptive Thinking for Design Leadership. Coaching adaptive capabilities to empower next visionary leaders** *Francesco Galli, Barbara Pino A., Irina Suteu*
- S4197 **Analysing the Digital Transformations, Territories, Frames and Uses**
Mario Gagliardi
- S4213 **Cause and Effect of Design Features and Brand Value: Consumer Interpretation of Design and Value of Long- and Short-Term Products** *Kana Sugimoto, Shin'ya Nagasawa*
- S4227 **Channelizing Thinking for Practical Innovations and Measurable Impact**
Kalyani Khodke, Sagar Behere
- S4241 **CO/DEsign: building a shared dialogue around analysis within co-design**
Michael Pierre Johnson, Jen Ballie, Tine Thorup, Elizabeth Brooks, Emma Brooks
- S4253 **Critical design as approach to next thinking**
Liene Jakobsone
- S4263 **Design Education at the Boundary**
Robert Potts
- S4281 **Design for Next Thinking. Using Transformation Consequence Mapping to Improve Responsible Innovation Practices** *Ashleigh Bentham*
- S4292 **Design for Subjective Wellbeing: Towards a Design Framework for Constructing Narrative**
Patrick W. Jordan, Andy Bardill, Kate Herd, Silvia Grimaldi
- S4307 **Design in the Middle: A New Approach to Collaborative Socio-political Design in Conflict Areas** *Merav Perez, Ezri Tarazi*
- S4319 **Designing for Violence. And its undoing**
Stahl Stenslie
- S4331 **Design-led Approach to Co-production of Values for Collective Decision-Making**
Sneha Raman, Tara French, Angela Tulloch
- S4343 **Driverless Governance. Designing Narratives Toward Democratic Technology**
Melika Alipour Leili, Winnie Tsai Chang, Corey Chao
- S4357 **Empathy and Design. A new perspective**
Alice Devecchi, Luca Guerrini
- S4365 **Envisioning urban futures: from narratives to composites.**
Serena Pollastri, Christopher Boyko, Rachel Cooper, Nick Dunn, Stephen Clune, Claire Coulton
- S4378 **Foucault and the smart city**
Ding Wang
- S4387 **Grounding Evidence in Design: Framing Next Practices**
Altuğ Kasalı, Nancy J. Nersessian
- S4398 **Idea Management. Identifying the factors that contribute to uncertainty in idea generation practices within front end NPD** *Se Ryeong Kim*
- S4409 **Implementation during design Developing understanding about service realisation before implementation** *Tim Overkamp, Stefan Holmlid*
- S4422 **Meaning, knowledge and artifacts, giving a voice to tacit knowledge**
Spyros Bofylatos, Thomas Spyrou
- S4434 **Outside the "Comfort Zone". Designing the Unknown in a Multidisciplinary Setting**
Kirsi Niinimäki, Marjaana Tantt, Cindy Kohtala

- S4444 **Paradoxes in Design Thinking**
Paul A. Rodgers, Giovanni Innella, Craig Bremner
- S4459 **Potentiality: the ethical foundation of design**
Peter Buwert
- S4468 **Prototyping the non-existent as a way to research and innovate: a proposal for a possible framework for design research and innovation** *Juan De la Rosa*
- S4477 **Rethinking the Roles of Fashion Designers. The Case of Pre Helsinki**
Namkyu Chun, Olga Gurova, Kirsi Niinimäki
- S4487 **Scalable Interactive Modular Systems (SIMS): sustainability for digital interfaces**
Luigi Ferrara, Nastaran Dadashi, Robert Giusti
- S4497 **Scientific Craftsmanship: The changing role of product designers in the digital era**
Muhammet Ramoğlu, Aykut Coşkun
- S4509 **Stimulating Thinking at the Design Pitch. Storytelling Approach and Impact**
David Parkinson, Laura Warwick
- S4519 **Synesthetic Approach in the Design Process for Enhanced Creativity and Multisensory Experiences** *Sevi Merter*
- S4529 **Systems thinking and its contribution to understanding future designer thinking**
Laura Mononen
- S4539 **Terms and meanings of “participation” in product design: From “user involvement” to “co-design”** *Lucía Sánchez de la Guía, Marina Puyuelo Cazorla, Blanca de-Miguel-Molina*
- S4552 **The Constellation: A framework for conceptualising design as a process of innovation.**
Joanna Bletcher
- S4565 **The design movement: Two case studies from the edge of the discipline**
Rebecca Price, Karla Straker
- S4575 **The use of intuition during scenario building activities in design projects**
Priscilla Ferronato, Stan Ruecker, Celso Scaletsky
- S4584 **To the new methodology of design consciousness for the futures**
Galina Lola, Tatiana Aleksandrova
- S4591 **Towards prospective design**
Bridgette Engeler
- S4600 **Ubiquitous Design. Ethnographic glances toward syncretisms, polyphonies, meta-fetishisms** *Massimo Canevacci*
- S4611 **Understanding Collaborative Design Through Activity Theory**
Mithra Zahedi, Virginie Tessier, Dave Hawey
- S4621 **User, Research, and Practice. Learning from Design Consultancies**
Işıl Oygür
- S4632 **Vapourworlds and Design Fiction: The Role of Intentionality**
Paul Coulton, Joseph Lindley
- S4643 **What counts when counting gets complicated?**
Elizabeth Wright, Simon Fraser, Thomas Eugene Wright Jr.
- S4652 **Yellow as “Non-Black”: Prosthetics, Semiotics, Hermeneutics, Freedom and Function**
Jonathan Ventura, Galit Shvo

WORKSHOPS

- S4671 **Discussing about “Inclusion in Sharing-Based Services”. A design workshop using an analytic tool** *Daniele Busciantella Ricci, Hua Dong, Alessandra Rinaldi, Francesca Tosi*
- S4678 **Eco-social design: who pays for it?**
Bianca Elzenbaumer, Fabio Franz, Kris Krois, Alvise Mattozzi
- S4683 **Experiencing Technology Enabled Empathy Mapping**
Daniel Neubauer, Verena Paepcke-Hjeltness, Pete Evans, Betsy Barnhart, Tor Finseth
- S4690 **Model and Mobilise Imaginary for Innovative Experience Design**
Estelle Berger, Frédérique Pain
- S4697 **Pablo Escobar: Zoomania in the narco imperium. The glorification of the cocaine network**
Catalina M Jaramillo
- S4710 **Perspectives on socially and politically oriented practices in design**
Bianca Herlo, Andreas Unteidig, Wolfgang Jonas, İdil Gaziulusoy
- S4714 **Spirit of ‘68. The ‘next’ role of the art/design school?**
Jo Turney, Alex Franklin
- S4721 **Strategies for synergies. Working in interdisciplinary teams**
Hannah Glatte, Marie Heidingsfelder, Franziska Brodack

POSTERS

- S4726 **A contribution for Jewelry Design Teaching**
Claudia Regina Batista
- S4730 **Analysis of Available Design Implementation Methods. A Study About Scarcity of Implementation Methods** *Ricardo Martins*
- S4734 **Anatomy of local government/design education collaboration.**
Adam Thorpe, Alison Prendiville, Lara Salinas, Sarah Rhodes
- S4738 **Breathing Games: Promoting Respiratory Health Through Co-creation**
Maria Frangos, Fabio Balli
- S4742 **Co–designing with plants. Degrading as an overlooked potential for interior aesthetics based on textile structures** *Svenja Keune*
- S4745 **Contemporary design. Variables and categories**
Vincenzo Maselli
- S4748 **Design for the Smart Cities. Investigation about citizen’s needs and products to improve public places** *Lola Merino Sanjuán, Marina Puyuelo Cazorla, Mónica Val Fiel*
- S4751 **Design Lab: For Future Research**
Ahmet Başkan, Füsün Curaoğlu
- S4754 **Designing for additive manufacturing technologies: a design research methodology** *Silvina Félix, Nuno Dias, Violeta Clemente*
- S4758 **Desirability in design for safety: Developing life jacket through creative problem solving method of TRIZ** *Shahin Matin, Mohammad hossein Namayandegi*
- S4761 **Exploring the Next Urban Condition**
Adam Fromme, Jeff Haase
- S4765 **From Co-Working Places to New Education Places**
Füsün Curaoğlu, Duysal Demirbaş

- S4768 **Image Management: The Contribution of Design**
Emilio Távora Vilar
- S4771 **Modes. A Multi-sensory Media Experience for Stress Reduction**
Emily Verba Fischer, John Hebbeler
- S4774 **MU.SA Method. Multimodal System Approach to the learning of the History of Design**
Isabella Patti, Roberta Vita
- S4778 **Multidisciplinary approach for a new vision of urban requalification. Multi-scale strategies of social innovation, economic improvement and environmental sustainability practices. Multi-scale strategies of social innovation, economic improvement and enviro** *Annamaria Bagaini, Zoe Balmas, Anna Koryakina, Anna Mangiatordi, Beatrice Jlenia Pesce, Caterina Reccia*
- S4781 **Resolving the OcuCheck: A Human-Centered Design Approach**
Matthew L. Bowman, Gina A. Taylor, Deana McDonagh, Leanne T. Labriola, Dipanjan Pan
- S4784 **The “T” shaped designer expertise. The “reverse-T” shaped designer horizon**
Daniele Baratta
- S4787 **The interface design for the application “Price My Job”**
Karolina Nunes Tolentino Costa, Claudia Regina Batista, Adhemar Maria do Valle Filho
- S4791 **The Premie Pod: A Wearable Incubator Designed for Premature Infants to Engage in Kangaroo Care** *Amanda Henderson, Deana McDonagh*
- S4794 **Threeing: Incorporating “Relational Circuits” into the Research Encounter**
Karl Julius Mendonca, Morgan Russell
- S4796 **What is Next for Design Semiotics Research? Searching for epistemological answers in design outcomes** *Felipe Domingues, Salvatore Zingale, Dijon De Moraes*

Foreword

It is my great pleasure to preface these proceedings of the 12th European Academy of Design conference, hosted by the Faculty of Architecture at Sapienza University over three days of a very warm April in 2017. The location could not have been more suitable: the largest and oldest University in Europe with a strong reputation for high-level academic endeavour, on the edge of one of the most beautiful public parks in central Rome.

I would like to take this opportunity to express my gratitude to the joint Chairs of the conference, Professor Lorenzo Imbesi and Associate Professor Loredana Di Lucchio, who were ably supported by Conference Manager Angela Giambattista and Communication and Media Manager Viktor Malakuczi, and a whole team of dedicated student helpers too numerous to mention by name. Despite its complexity, the conference ran smoothly, and all concerned seemed to enjoy the experience.

Design for Next was one of the busiest EAD conferences to date, with 550 delegates attending over the three days. In total, 379 full papers were presented across nine parallel tracks, along with 22 poster presentations, and 8 workshop events. The six keynote speakers gave thought-provoking and inspirational presentations, and set the tone for in-depth academic debate centred on the forward-thinking topics forming the thematic strands of the conference.

The results of the event are collected here to form a lasting record of an amazing conference. The range of topics covered and the variety of issues debated is a wonder to behold. I hope they prove of interest and value to everyone.

Paul Atkinson

President of the European Academy of Design

Introduction: Designing a Design Conference

12th EAD - European Academy of Design Conference, Design for Next

"If others can see it as I have seen it, then it may be called a vision rather than a dream."

W. Morris, News from Nowhere (1890)

It has been a honor to welcome the EAD community in the city of Rome in Italy, to host its 12th International Conference in 2017 at Sapienza University. The program fostered discussion among designers, academics and experts about the articulated scenario of contemporary design and its perspectives, with the intent to nurture diversity and interdisciplinarity.

'Design for Next...' is the title and topic where 'Next' implies the concept of proximity as well of destination, related to time and physical space. Contemporary shifts in society, technology and production are reframing design processes, approaches and tools. While the design community is questioning about the next stage of innovation, design is evolving as a wide open field with many applications and meanings. More than ever it is important to investigate through design research and practice in order to tackle the societal, technological and industrial challenges of the future.

Thanks to the contribution of professionals, educators and researchers we wanted to prompt reflection on the future fields of investigation in Design, as well to discover and to connect the spaces and the people who share common interests in Design research.

When the call for papers started, we launched two important questions: what is Design for Next? And what is the 'Next' focus of Design? We invited the authors to reflect on the different nature of Design for 'Next': Aesthetics, Education, Economy, Environment, Health, Industry, Society, Technology, Thinking... Each track focused around a keyword to engage and tackle the different fields of Design research and practice. Together, in this process, we have been drawing the big picture of Next Design.

The conference followed a long double blind peer review process with the support of 28 track chairs and beyond 100 reviewers selecting the ultimate research in design with scientific rigor, to end up with the following conference proceedings and a special issue of the Design Journal with a selection of the best papers. During the three days of the Conference, we reached an incredible number of attendees coming from any region in the world and presenting in nine parallel tracks. Academics, students, professionals, companies and industry engaged an interdisciplinary debate and developed the opportunity to share ideas and research experiences within the EAD Community with plenaries, workshops, roundtables, seminars, parallel sessions, poster sessions and of course activities for socializing and networking.

As well, eight international leading thinkers on Design acted as keynote speakers and introduced a range of different ways of approaching the next future. The plenary sessions were organized to have both contributions in design experimentation and practice, and at the same time a theoretical reflection to foster design thinking, also sharing global and local perspectives. Derrick De Kerckhove described his personal vision of next in the field of Design, society and technology; Maurizio Montalti (Officina Corpuscoli) displayed his exploration on the discipline of design, aiming to investigate and reflect upon contemporary culture, thereby creating new opportunities and visions for both the creative industry and a broader social spectrum; Gavin Munro presented how his practice (Full Grown) challenges the way we create products, as well as how we see the artifacts surrounding ourselves, often replacing the natural environment; Nicolas Nova (Geneva School of Art) shared his approach on reflecting on the next future, practicing research on the new media practices, design

fiction and speculative design as co-founder of 'The Near Future Laboratory', a research organization based in Europe and California; Anna Pellizzari (Executive Director at Material ConneXion Italia) is one of the most inspiring women in the Italian design scenario and she focused on the importance of innovative materials for the next design generation; Arturo Vittori (Architecture and Vision, Warka Water) displayed how merging innovative technology together with ancient tradition can result in projects on the edge between Art and Science addressing the most urgent needs of our society. Additionally, we hosted two special guests: Tonino Paris, who is the founder of the School of Design at Sapienza in Rome, and who introduced a concept of design related to the material culture of the places, and Ezio Manzini presented design for democracy as the next challenge for our community.

Among the activities, the conference featured the project 'Design for Next Lazio', which is an international project addressed to the local companies operating in Design. The initiative aimed to connect Business and Design in the Lazio Region directly involving Companies, Professionals, Associations and Schools of design. That's why the project is realized in partnership with Sapienza University of Rome (Department of Planning, Design, Architectural Technology), ISIA Roma Design (Istituto Superiore per le Industrie Artistiche), IED (European Design Institute), QDU (Quasar Design University), RUFA (Rome University of Fine Arts), ADI (Territorial delegation of ADI Association for Industrial Design), OAPPCR (Ordine degli Architetti, Pianificatori, Paesaggisti, e Conservatori di Roma) and Italian Academy of Arts Fashion Design. The final goal of 'Design for Net Lazio' is to create a shared path of co-design to develop new industrial processes and products. Last step of the initiative was the exposition of all projects and the awarding of the best ones. The initiative has been coordinated by the Lazio Region and Lazio Innova, the regional agency for innovation supporting both enterprises and the local public authorities by providing services for startups and biz development, venture capital, internationalization services, financial and valorization of regional clusters and regional champions. Its task is to enhance Lazio as a Region of Innovation with an international dimension and promote technology transfer and the innovation-competitiveness-internationalization process, to enter the international value chain. In order to focus on strategic topics, the initiative has been taking into account three thematic areas which featured three roundtables, with the participation of experts, academics, professionals, companies and students: Industry 4.0, Design for Smart City and Cultural Heritage.

Again, we have been honored to welcome the 12th EAD conference at Sapienza University of Rome: our academic institution was founded in 1303 by Pope Boniface VIII in Rome, with its 115,000 students and 4.000 professors and researchers. It is one of the oldest universities in the world and the largest in Europe, a top performer in international university rankings thanks to the 63 Departments organized in 11 Faculties that drive high levels of excellence in several fields of knowledge. In particular, our Department, "Planning, Design, Technology of architecture (PDTa)", manages the Research and the Didactic activities in the field of Design in Sapienza. The Conference was hosted in the historical venue of the Faculty of Architecture in Valle Giulia, located at the border of Villa Borghese, the greatest public park in the Centre of Rome.

Ultimately looking into the massive selection of papers in the proceedings, we believe the conference helped sharing and networking within our international design community, so giving a contribution to the progress of research and knowledge. We wish to nurture 'Design for Next' and then this book should envision where we are going.

Loredana Di Lucchio, Lorenzo Imbesi
Co-Chairs of the Conference

Keynote speakers

Nicolas Nova is an ethnographer and design researcher, working both as a Professor at the Geneva School of Arts and Design (HEAD – Genève) and as co-founder of The Near Future Laboratory, a research organization based in Europe and California. His work focuses on observing and documenting digital and new media practices, as well as creating design fictions, i.e. speculative designed objects exploring the experiences of near future. He holds a PhD in Human-Computer Interaction from the Swiss Institute of Technology (EPFL, Switzerland) and was previously a visiting scholar at Art Center College of Design (Pasadena), ENSCI - Les Ateliers (Paris) and Politecnico di Milano.

Maurizio Montalti. Strongly rooted in a collaborative, research-based and experimental approach, Maurizio Montalti's work tends toward the exploration of the design discipline, aiming to investigate and reflect upon contemporary culture, thereby creating new opportunities and visions for both the creative industry and the broader social spectrum. Maurizio's practice, "Officina Corpuscoli", seeks to reveal unorthodox relationships among existing paradigms, aiming to promote the growth of critical thinking, through the development and materialisation of tangible alternatives. Maurizio holds a Master in Industrial Engineering from the University of Bologna (IT) as well as a Master in Conceptual Design in Context from the Design Academy Eindhoven (NL). His work has been widely shown in multiple museums, exhibitions and festivals, both nationally and internationally.

Gavin Munro is an artist and designer from Matlock, Derbyshire. Gavin has lent his hand to a number of different skills, from furniture to houses, and everything in between. Inspired by a childhood experience with a bonsai tree, and constantly encouraged throughout his life, Gavin finally made growing furniture his full time profession. He now lives in Wirksworth, Derbyshire, with his loving wife Alice, and their full-time boss, Lina, the lurcher.

Arturo Vittori is an Italian Artist, Architect and a Designer. His work is internationally known for merging cutting edge technologies together with ancient traditions resulting in projects on the edge between Art and Science that answer our society's most urgent needs. After graduating he gained experiences collaborating with Santiago Calatrava, Jean Nouvel, Future Systems, Anish Kapoor. He was Manager of Aircraft Cabin Design at Airbus and involved in Yachts and Cruisers design at Francis Design. Vittori, since 2002, is directing the research and design studio Architecture and Vision, Italy, he is also the CEO of the American NGO Warka Water Inc.

Derrick De Kerckhove (born 1944) is the author of *The Skin of Culture* and *Connected Intelligence* and Professor in the Department of French at the University of Toronto, Canada. He was the Director of the McLuhan Program in Culture and Technology from 1983 until 2008. In January 2007, he returned to Italy for the project and Fellowship "Rientro dei cervelli", in the Faculty of Sociology at the University of Naples Federico II where he teaches "Sociologia della cultura digitale" and "Marketing e nuovi media". He was invited to return to the Library of Congress for another engagement in the Spring of 2008. He is research supervisor for the PhD Planetary Collegium M-node directed by Francesco Monico. Since 2008 he oversees global art projects for Solstizio, co-founded by the artist Giuseppe Stampone.

Anna Pellizzari is the Executive Director at Material ConneXion Italia, is an expert on materials design, with more than 25 year of experience in the field. She has attended short courses at Domus Academy in Milan, Central St Martins of London, and the Fashion Institute of Technology in New York and worked in graphic design, textiles, design of materials, CMF. Her collaborations include several major brands in the sectors of sporting goods, automotive, interiors, packaging.

About



SAPIENZA
UNIVERSITÀ DI ROMA

Sapienza University of Rome, which was founded in 1303 by Pope Boniface VIII in Rome, with its 115,000 students and 4.000 professors and researchers, is one of the oldest universities in the world and a top performer in international university rankings thanks to the 63 Departments organized in 11 Faculties that drive high levels of excellence in several fields of knowledge.

The Department of Planning, Design, Technology of architecture (PDTa), within the Faculty of Architecture, manages the Research and Didactic activities in the field of Design in Sapienza.

The Design Degrees in Sapienza are:

- the Bachelor Degree in Industrial Design (taught in Italian);
- the Master of Science in Design and Visual and Multimedia Communication (taught in Italian);
- the Master of Science in Product Design (taught in English).

Moreover, an interdisciplinary PhD Program in 'Planning, Design, Technology of architecture' is managed by the Department PDTa offering 12 positions per year.

The Design Research is supported by two University Laboratories:

- Sapienza Design Factory (SDF), focused on Product Design for Industry 4.0;
- Photomedialab, focused on Communication Design.

The
European
of **Academy**
Design

The **European Academy of Design (EAD)** was formed to promote the publication and dissemination of research in design through conferences hosted by different educational institutions in Europe and the publication of proceedings, newsletters and a journal. It was also formed to improve European wide research collaboration and dissemination.

The EAD was formed in 1994, to improve European-wide research collaboration and dissemination and to promote the publication and dissemination of design research.

The Academy is headed by a committee of leading academics from across Europe, as well as from North America and Australia.

To date, the Academy has hosted twelve international conferences.

Since 1997, The Design Journal had been published in association with the European Academy of Design. This refereed journal, published four times each year, provides a platform for the dissemination of design thinking and research. It aims to encourage discussion across traditional boundaries between practice and theory, and between disciplines defined by working media, materials and areas of application.

The Academy also publishes the proceedings of its conferences.

Membership is open to all of those interested in design research, whether academic, student or practitioner.

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Anamorphosis and Contemporaneity

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Abstract: Today, anamorphoses are increasingly used in the field of Graphic & Architectural Design.

The construction methods of anamorphoses have not changed since those theorized and used by the first treatise writers in 1600. A comparison between some of the existing procedures, based on the use of new technologies, and the theoretical concepts of the past shows that little or nothing has changed from a conceptual point of view. Those who make anamorphoses these days still follow, for example, the indications taken from Nicéron's studies, even though this task is made easier by the use of computers and video projectors.

Some researchers have also developed software programs to facilitate the transformation/anamorphic deformation, although they did so mostly for their personal interest rather than to follow an input given by research bodies.

The final objective of the study is to understand the possible further developments of anamorphoses in the field of Graphic & Architectural Design. In other words, the way reverse perspective is used, not only as a subject matter that is taught and explored at a theoretical and academic level, but as a living matter, with which one can have a dialogue to achieve those results that have always fascinated both researchers and the beneficiaries of the works inherited from the past up to our days.

Keywords: Anamorphosis, Graphic Design, 3d Modeling

1. Introduction

In Graphic & Architectural Design, anamorphoses are increasingly used with different implementing and representation methods; this is still a topic of interest in research, pretty much like personal reflections (think of the studies on perspective conducted by Erwin Panofsky (Panofsky, 1927) and Decio Gioseffi (Gioseffi, 1957) and the debate on spatial representation from the 1950s onwards) which can therefore find new opportunities in terms of research and development.

In recent years, anamorphoses have been used and applied to Graphic Design. Many researchers have observed and documented the artistic experimentation by "3D Chalk Painters; among them, Kurt Wenner, Julian Beever, Manfred Stader, Edgar Muller, Eduardo Relero and Leon Keer; they also looked into certain types of anamorphic art made without drawings and paintings, as the "ephemeral

garden" realized in the square of the town hall of Paris¹ (Lazzaro et al., 2013), or the urban anamorphoses created by the Swiss artist Felice Varini (Di Paola et al., 2014) (Varini et al., 2004).

Some artistic experiences, as it happened in the past with the painting of the Ambassadors by Hans Holbein (1533), have created a movement of perspective investigators, focusing their attention on anamorphoses and their contemporary applications.

In Graphic & Architectural Design, anamorphic studies are still based on a theoretical/practical approach tied to the first treatise writers of '600, on studies and ideas from the last 40 years, and on those who are now testing new computer-based techniques and technologies.

The first treatise writers studied the main aspects of perspective and thoroughly examined the theoretical and practical aspects of anamorphoses. They still represent an important reference with respect to theory. Among them, it is worth mentioning S. de Caus (de Caus, 1611), J.F. Nicéron (Nicéron, 1638) (Nicéron, 1646), E. Maignan (Maignan, 1648) and A. Pozzo (Pozzo, 1693). Initially, anamorphosis was studied by exploring cross-sectional subject matters such as mathematics, physics, gnomonics and perspective itself. In particular, Donato Bramante, Andrea Pozzo and Emmanuel Maignan carried out in Italy some studies on perspective and anamorphosis which later became true cornerstones, frequently recalled in studies conducted in the subsequent centuries: Bramante, thanks to the clever use of perspective, in the church of Santa Maria in San Satiro in Milan, realized the perspective illusion of an apse in a space where, for architectural and dimensional reasons, the nave only ended with a transept (Fig. 1); Pozzo painted, in the church of St Ignatius of Loyola in Rome, a false dome ceiling on the flat ceiling of the Church (Fig. 2); Maignan realized a fresco on the life of S. Francesco di Paola, in a hallway of the convent of Trinità dei Monti in Rome.

Much later, coming to our days, thorough studies of anamorphosis, anamorphic works and treatise writers have been conducted in the last forty years by J. Baltrusaitis Baltrusaitis (1978), S. Naitza Naitza (1980), E. Battisti (1981), J. Elffers (Elffers et al., 1981), D. Toffanello (1996), R. Migliari (Migliari et al., 1999), A De Rosa (De Rosa et al., 2002), K. Andersen (2007).

Other investigators have analyzed the links between anamorphoses and other contemporary research areas, emphasizing 3D geometry, like D. Hansford (Hansford et al., 2007); others, like F. Di Paola (Di Paola et al., 2014), have described how digital techniques can simplify anamorphic applications even in the case of projections on complex surfaces and some contemporary artistic applications, like P. Di Lazzaro (Lazzaro et al., 2013).

In architecture, anamorphoses were used to realize special viewing effects or to solve problems like the impossibility to provide complex structures due to the lack of space or money; in our time, anamorphosis is mostly employed in Graphic & Architectural Design and related applications (visual graphic, exhibit design, advertising design, playful design).

This study aims at describing the state of the art and any possible theoretical and practical developments in this specific field.

As we will see, the construction methods of anamorphoses have not changed since those theorized and used by the first treatise writers in 1600. A comparison between some of the existing procedures, based on the use of new technologies, and the theoretical concepts of the past shows that little or nothing has changed from a conceptual point of view. Those who make anamorphoses

¹ Garden project by François Abélanet, realized in the square facing the Hôtel de Ville, seat of the town hall of Paris, on exhibition between 24 June and 17 July 2011.

these days still follow, for example, the indications taken from Nicéron's studies, even though this task is made easier by the use of computers and video projectors.

Some researchers have also developed software programs to facilitate the transformation/anamorphic deformation, although they did so mostly for their personal interest rather than to follow an input given by research bodies.

The final objective of the study is to understand the possible further developments of anamorphoses in the field of Graphic & Architectural Design. In other words, the way reverse perspective is used, not only as a theoretical subject that is taught and explored at a theoretical and academic level, but as a living matter, with which one can have a dialogue to achieve those results that have always fascinated both researchers and the beneficiaries of the works inherited from the past up to our days.



FIG. 1 - Donato Bramante, fake apse of the church of "Santa Maria presso San Satiro" in Milan, 1483. (Image by the author)



FIG. 2 - Andrea Pozzo, view of the fake dome and its spatial reconstruction model, church of Saint Ignatius of Loyola in Rome, 1685. (Image by the author)

2. Construction of anamorphoses: past and present techniques

In Graphic & Architectural Design, the first and important prerequisite is the possibility to use representation tools embedded in the latest technologies (such as computers, 3D simulations and video projectors). Have these new tools generated new procedures to create anamorphoses? Or the construction principles of the geometric structure have remained unchanged?

The following paragraphs show that the geometrical structures of anamorphoses (thanks to the analogies between the anamorphic constructions suggested by the treatises of '600, with particular reference to the Nicéron's studies, and contemporary operational methodologies) are still based on the same theoretical and construction principles of the past with the addition of certain contemporary instruments.

The cases analyzed range from the transformation of a 2D representation to the realization of a 3D model:

1. use of photo editing (2D) applications to generate an anamorphic grid;
2. use of video projectors connected to a computer, with the addition of a photo-editing software (2D);

3. use of 3D modeling - construction and 3D simulation of the objects on which to perform the anamorphic projection.
4. These are contemporary tools resulting from new technologies:
5. anamorphosis software;
6. dynamism in anamorphoses.

3. The construction of the anamorphoses according to Nicéron

One point perspective anamorphosis (on a horizontal or vertical plane) was well described by J. F. Nicéron in his treatise *La perspective curieuse ou magie artificielle des effets merveilleux*, published in Paris in 1638 (Nicéron, 1638).

The second book of *La perspective curieuse ou magie artificielle des effets merveilleux*, second proposition, illustrates "the process to draw any sort of figure, image, or painting, in the same manner as the chair of the previous proposition, i.e. so that it is perfectly recognizable only if viewed from a certain point".

The process explains how to realize the anamorphoses of a square or rectangle, divided into many smaller squares, and then move, as in a magnification, any image through the use of a square mesh.

The method to obtain the anamorphoses of the figure inserted in the square is illustrated in Table XII (Fig. 3): "Draw a segment having the same size as the side of the square, then divide it into as many parts as the divisions of that side; start from these divisions to draw straight lines to the main point, that will be placed as far as the desired deformation; after choosing the point of distance, on the horizontal line, near the main point, join it with the opposite end of the segment from which you started. In this way, by drawing a parallel line to this segment, whenever this junction intersects one the straight lines leading to the main point, you will obtain the subdivisions, in depth, of the chessboard, and therefore its distorted image".

This proposition has three corollaries. The first relates to the examples in Table XIII (Fig. 4), where two faces are redrawn, distorted, inside these elongated quadrangles in such a way as to require a side view.

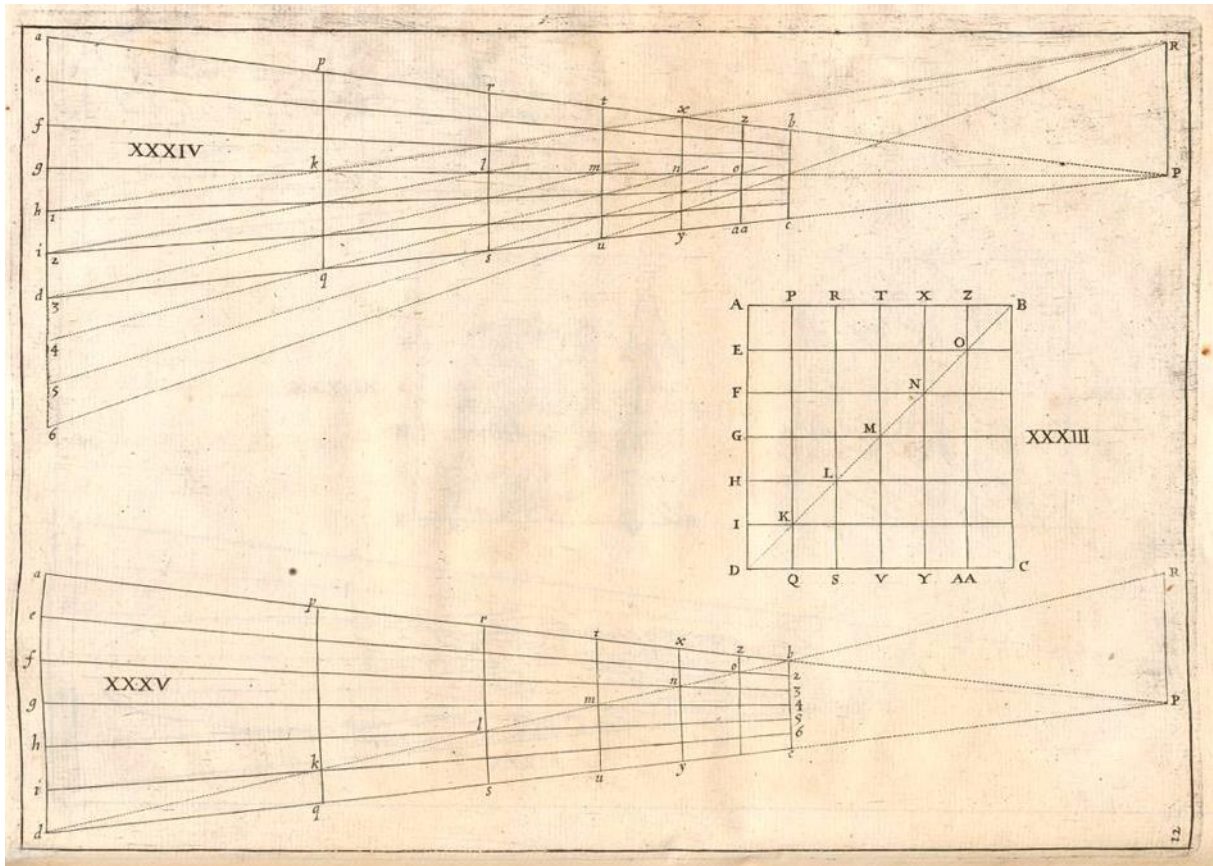


FIG. 3 - J.F.Nicéron, *La perspective curieuse ou magie artificielle des effets merveilleux*, ed. Paris, 1638. Table XII.

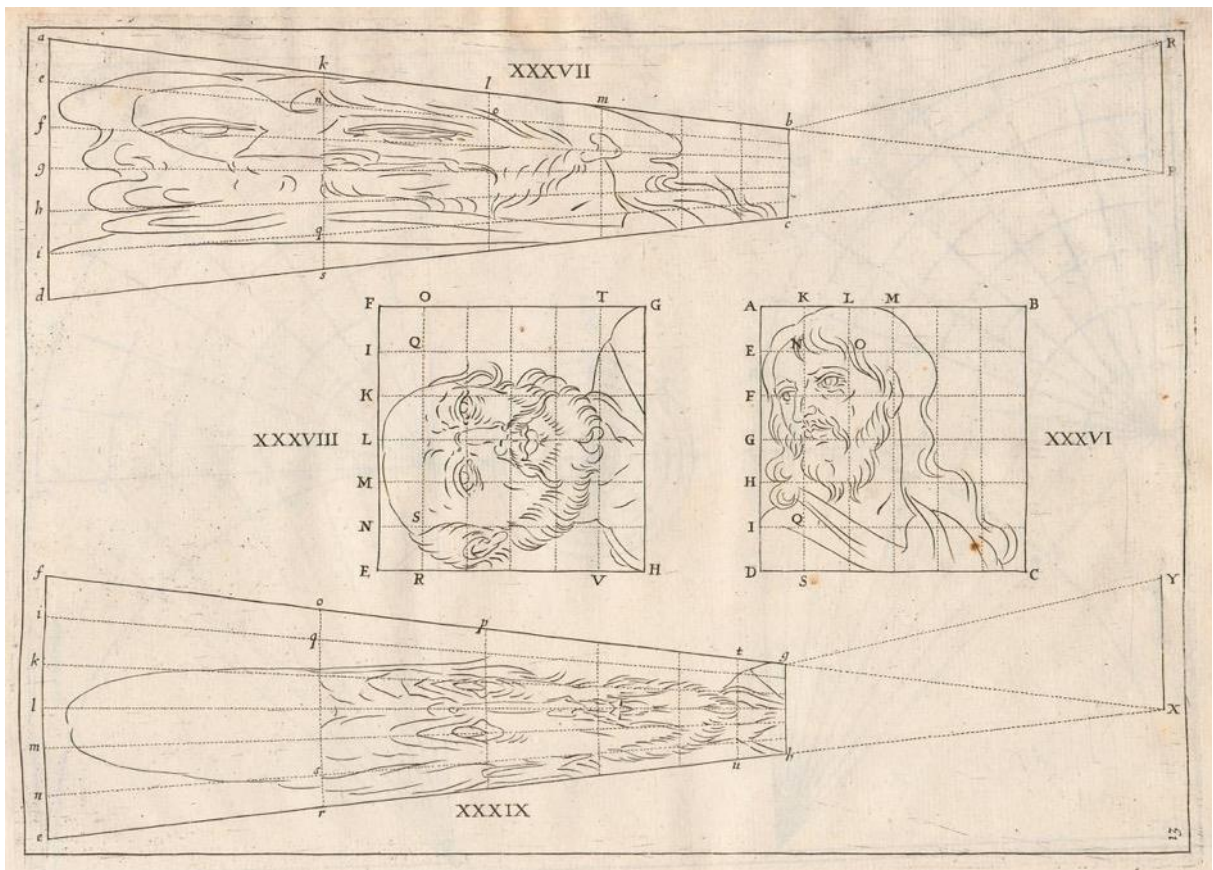


FIG. 4 - J.F.Nicéron, *La perspective curieuse ou magie artificielle des effets merveilleux*, Parigi, 1638. Table XIII.

In *Thaumaturgus opticus* (Niceron, 1646), Latin edition of 1646, an expanded version of the treatise with respect to *La perspective curieuse*, Niceron explained how some prospective machines operate; he illustrated a method where straight wires are employed to materialize visual rays and draw large anamorphic images as the one shown in Book Three of Emmanuel Maignan's treatise (Maignan, 1648) (Fig. 5).

Methods similar to those described above are used to transfer scenic paintings created "flat" on curved surfaces (domes and vaults, for example). Yet, the observer perceives "natural" images regardless of the shape of the pictorial surface: for this purpose, we may use the projection of shadows through light sources, with the help of grids or pierced cardboards that are projected above highly tilted plans or other kinds of surfaces (Iurilli, 2014, p 47-48).

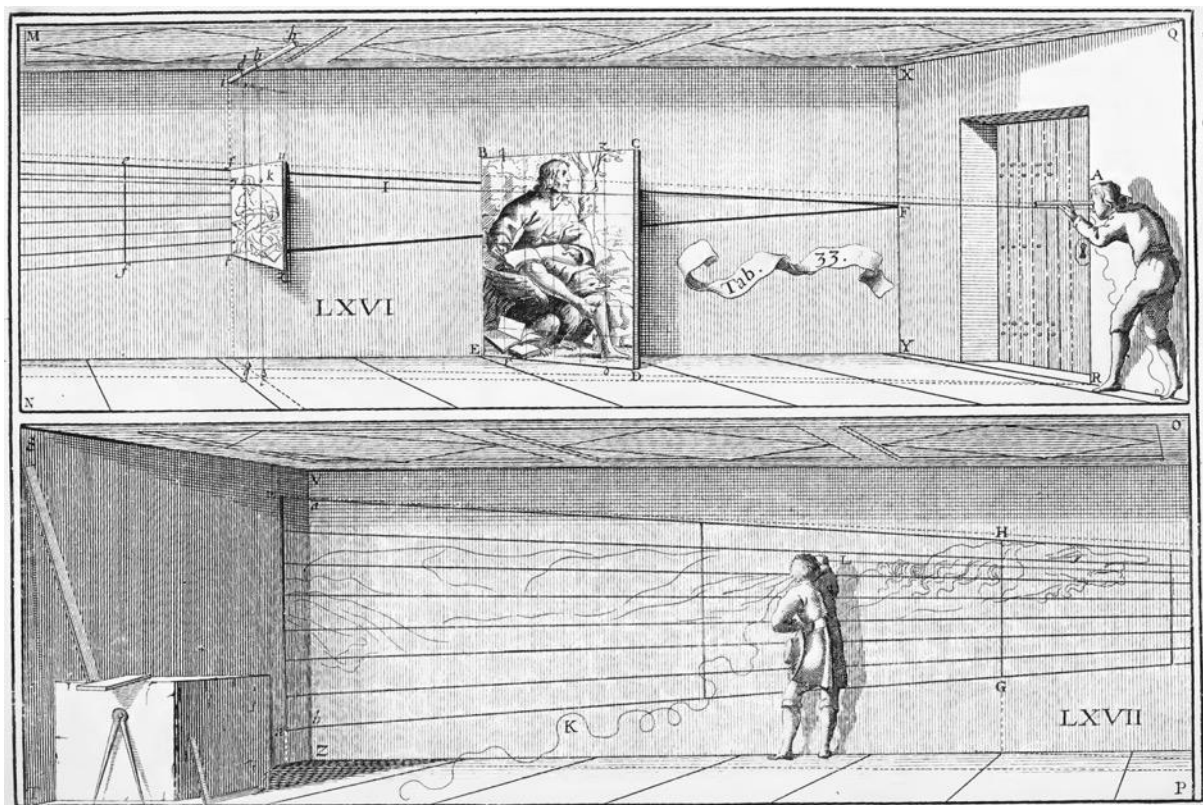


FIG. 5 – Anamorphic structure by J.F. Niceron, *Thaumaturgus Opticus* (Tab. 33, Fig. LXVI and LXVII), Paris, 1646.

4. The construction of anamorphoses in Graphic & Architectural Design

4.1 Use of photo editing applications

Some procedures currently employed to create anamorphoses are conceptually and operationally very similar to the studies conducted by Niceron in *La perspective curieuse* and to the anamorphic structure described in Table. 33 of *Thaumaturgus opticus* (Fig. 5).

Photo editing applications allow to interpret in a similar manner the second proposition of *La perspective curieuse* by Niceron and the content of Tables XII (Fig. 3) and XIII (Fig. 4).

Given the ABCD grid and the abcd mesh (Fig. 6a), distorted according to the projection from point of view Y (with X projection in the reference plane α), you can distort the figure of a cube positioned in ABCD grid (Fig. 6b) using the application transformation tools. AD points first coincide with ad (Fig. 6c), then CB side coincides with the straight line containing cb (Fig. 6d). Using the "distortion" or "perspective" command, the ABCD grid is caused to coincide with abcd grid (Fig. 6e). The resulting anamorphic image (Fig. 6f), displayed from point of view Y (Fig. 6g), takes on the true, desired shape.

This procedure is used to define anamorphic images on vertical or horizontal planes, as in advertising panels in football or rugby stadiums or in Formula 1 circuits.

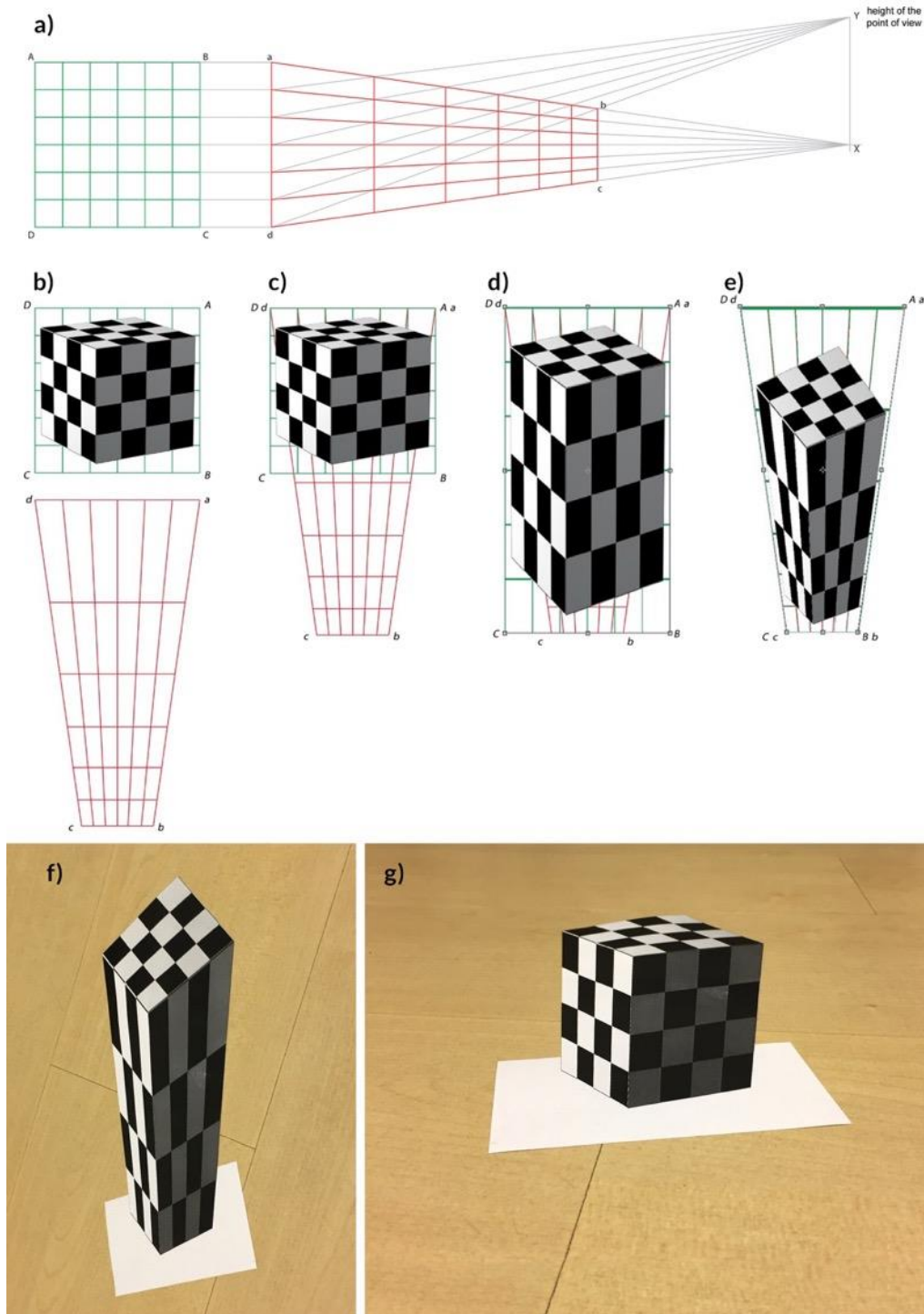


FIG. 6 - Anamorphic grid realized with a photo editing software.

4.2 Use of video projectors

The use of projectors or video projectors placed in point of projection, constitutes a contemporary interpretation of what was described by Nicéron in Tab. 33, Fig. LXVI, LXVI of *Thaumaturgus opticus* (Fig. 5).

With a high brightness projector, such as, for example, in Felice Varini's works of art, a transparent film on which the monochrome image that you want to decompose in space is used: this is like an "anamorphosis obtained by spatial decomposition".

Projection point in Varini's works is placed at eye-height (about 1.50 m) from the floor plane. The identification of the points of objects, arranged in space, on which to draw the anamorphic figure does not need the construction grid assumed by Nicéron; thanks to technology, the lines of projection are replaced by the light rays of the projector itself and the shape of the figure is directly transferred on the surfaces on which it is projected.

The contours of the distorted image are marked with the use of tapes, brushes or markers directly on the spot, quite similarly to the character in figure LXVII, Tab. 33 of *Thaumaturgus opticus* (Fig. 5).

During the next step, the parts that make up the image to be displayed will be filled with colored paints (Fig. 7).

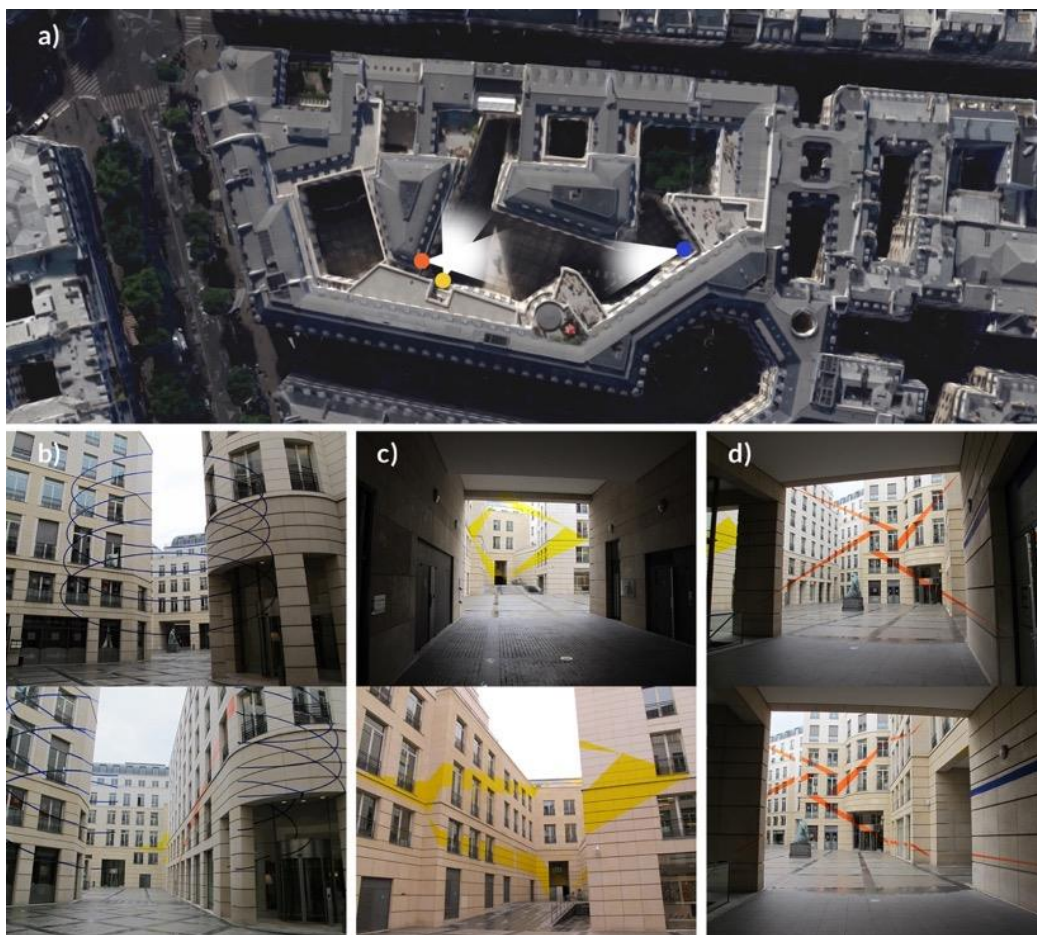


FIG. 7 - (a) F. Varini, urban anamorphosis by spatial deconstruction at Passage Capucines, Paris (2012). (b) Work: "Cinq ellipses ouvertes". On top, point of view where the image is reconstructed. Bottom, image deconstructed in space. (c) Work: "Double trapeze pour quatre triangles". On top, point of view where the image is reconstructed. Bottom, image deconstructed in space. (d) Work: "Quatre triangles pour deux fenestres". On top, point of view where the image is reconstructed. Bottom, image deconstructed in space. (Images by the author)

In the case of video projectors, such as, for example, in Ghigos Ideas' exhibit design for the DOCVA archive design and fitting at the MAXXI museum in Rome (Fig. 8a) , the above described procedure is slightly different. They used a video projector to realize the anamorphosis of the logo of the Documentation Center for Visual Arts, with the point of view placed at the entrance of the exhibit itself (Fig. 8b). A video projector connected to a computer, and a photo-retouch software, allow to project different colors, differently from the previously described procedure, so that you can handle polychrome pictures as well (Fig. 8c).



FIG. 8 - (a) Ghigos Ideas: Anamorphosis reconstructed in space, Maxxi Museum, Rome (2011). (b) Ghigos Ideas: Point of view marking. (c) Ghigos Ideas: Logo broken down in space. (Image by Ghigos Ideas)

4.3 Use of 3D modeling

The three-dimensional modeling procedure allows an operating mode in which the construction, with reference to exhibit design, in the anamorphic apparatus may also occur in a place different from where it will be displayed.

The 3D simulation and construction of both objects, on which the anamorphic projection is made, and the anamorphosis itself are more controllable; editing and processing operations can be performed in real time. The virtual environment allows for a "preview" of both the expected result and the anamorphoses.

A convincing illustration of the procedure is the reconstruction of the 2014 exhibition "The Observatoire des innovations" at the Musée de la Cité des Sciences et de l'Industrie de la Villette in Paris.

Anamorphosis is created by spatial deconstruction on objects designed and arranged for a spatial reconstruction of a square from the point of view (Fig. 9). It is the evolution of the procedures described by Niceron, where technology allows for an improved control of shapes and desired results. The anamorphic apparatus described in Tab. 33 of *Thaumaturgus otipicus* is created and verified in a virtual environment with the help of numerical control machines. The virtual image and assumptions are then put together on site.

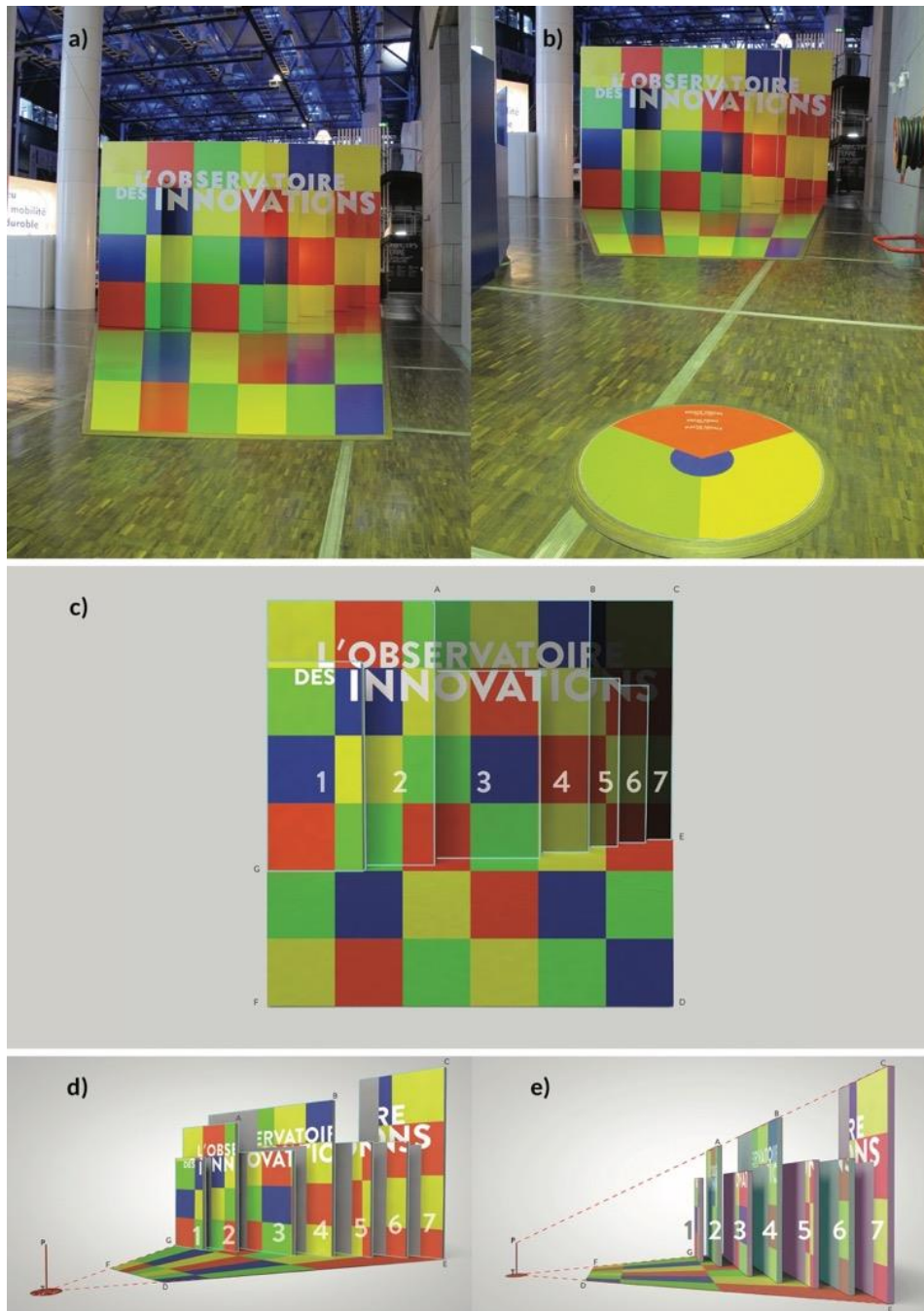


FIG. 9 - (a) Musée de la Cité des Sciences et de l'Industrie: point of view where the anamorphic deconstruction is reconstructed, Paris (2014). (b) Point of view of anamorphic reconstruction. (c) 3D reconstruction of objects on which the anamorphic image is broken down. (d-e) 3D reconstruction of objects making up the deconstructed space. (Images by the author)

5. Anamorphosis software

A projection procedure can be associated to a computer algorithm to process and distort an image. However, with few exceptions (like Anamorph Me!2 and "Simple Anamorphic Converter"), no specific software is available to facilitate the realization of anamorphoses; used softwares simply performs a 3D check of the final result of the spatial processing. This can be obtained, for example, with Grassopher (algorithmic modeling for Rhino) and Blender, or with other generic 3D modeling applications.

In the field of "Portable Devices", some smartphones and tablet apps have been developed, like "Imorph" or "AnamorPhoto" to provide minor anamorphic transformations; however, these apps are mostly used for entertainment purposes rather than to obtain significant results having a real interest or value in the field of perspective.

It is quite clear that researchers' interest has not turned yet into the manufacture of special computer software and projection tools. The study of descriptive geometry and the development of its related research is currently explored by a limited group of investigators, in spite of the widespread interest in some of its specific applications, like anamorphosis.

6. Dynamic anamorphoses

"Dynamism in anamorphoses" is closely linked to the use of new techniques and technologies, and is the subject of research and applications in several, different areas:

- dynamic anamorphosis that adapts itself to the changing position of the observer so that wherever the observer moves, he sees the same undeformed image. This dynamic changing of the anamorphic deformation in concert with the movement of the observer requires from the system to track the 3D position of the observer's eyes and the re-computation of the anamorphic deformation in real time (Rvnik et al. 2014. 46-62);
- dynamic anamorphosis that take into account the motion of objects, such as for example their rotation around an axis of revolution or the movement of the observer, moving around one or more objects, to obtain different anamorphic reconstructions.

The second case is increasingly common in advertising design (shorts and videoclips) where filmmakers focus on optical effects and anamorphic images.

The camera movement, along a pre-arranged path, allows the spatial reconstruction of a sequence of serial anamorphoses; they are part of the narrative path, for example, in the 2013 advertising campaign of Honda CR-V3 (Fig. 10), or Vodafone4 in New Zealand (2010), or the video for OK Go band in "The Writing's On the Wall"5 (2014).

2 In 2001, Philip Kent developed a free software, Anamorph Me!, that allows to carry out almost all traditional anamorphic transformations using perspective and mirrors.

Anamorph Me! (<http://www.anamorphosis.com/software.html>) can read images in the most common formats (e.g. JPEG, BMP) and carry out a range of anamorphic transformations on them - including oblique, cylindrical mirror and conical mirror.

Being the software an author's independent project, it offers only limited image manipulation functions. For standard operations such as cropping, changing brightness, contrast and colors, and advanced printing, users need a professional image manipulation program.

3 <https://www.youtube.com/watch?v=7PGXZ-oc2-g>

4 <https://www.youtube.com/watch?v=T4WFzvkzCKc>

5 https://www.youtube.com/watch?v=m86ae_e_ptU



FIG. 10 - Advertising anamorphosis: Honda's CR-V campaign (2013).

7. Conclusions

While anamorphosis was used in the past to hide certain messages in the painting (as in pictorial images or drawings) or to exploit illusory images in the absence of real architectural structures (walls, domes, depths of spaces in general) or it was just impossible to create them, today anamorphosis is predominantly used in the field of Graphic & Architectural Design, Architecture and advertising for visual communication purposes (visual design, exhibit design, advertising design, etc.).

We have seen that the construction methodology has not changed compared, for example, to Nicéron's theories in the seventeenth century. Operating modes have changed, though: computer and video projectors simplify the geometrical construction and realization of anamorphoses.

Moreover, the new techniques allow to introduce the 4th dimension (kinematism). In fact, the possibility to view the space no longer only from a fixed point, thanks to the use of the cameras, as seen in the paragraph on "applications in advertising", allows to create "anamorphic paths" in which the shape and meaning of objects change as a function of the angle with which they are framed and then shot. The construction of the "anamorphic path", in this case, can be ruled only by computer procedures.

As to IT applications, there is still a lack of research defining specific anamorphosis-generating software. The use of popular applications (photo editing or 3D modelling software) entails a sound knowledge of the rules of descriptive geometry and perspective. This is the reason why anamorphoses can only be realized by investigators with a proper scientific background in this field. As to the future, a joint interdisciplinary research effort between descriptive geometry experts and algorithm developers would be more than welcome. Such research could enable, for example, the implementation of open source software programs with new pull down menus for anamorphosis creation, like Blender⁶.

⁶ Blender allow to customize pull down menu considered as an implementation of the system using Python scripts.

References

- Andersen, K. (2007). *The Geometry of an Art: The History of the Mathematical Theory of Perspective from Alberti to Monge*. New York: Springer
- Baltrusaitis, J. (1978). *Anamorfoosi o magia artificiale degli effetti meravigliosi*. Milan Adelphi Edizioni
- Battisti, E. (1981). *Anamorfoosi, evasione e ritorno*. Rome: Officina
- De Caus, S. (1611). *La perspective avec la raison des ombres et miroirs*. London: R. Barker
- De Rosa, A., D'Acunto G. (2002). *La vertigine dello sguardo. Tre saggi sulla rappresentazione anamorfica*. Venezia: Cafoscarina
- Di Lazzaro, P., Murra, D. (2013). *L'anamorfoosi tra arte, percezione visiva e "prospettive bizzarre"*. Rome: ENEA
- Di Paola, F., Pedone, P., Inzerillo, L., Santagati, C. (2014). Anamorphic Projection: Analogical/Digital Algorithms. *Nexus Network Journal - Architecture and Mathematics* 2014 17:225
- Elffers, J., Schuyt, M., Leeman, F. (1981). *Anamorphosen*. Köln: Dumont
- Gioseffi, D. (1957). *Perspectiva artificialis. Per la storia della prospettiva, spigolature e appunti*. Trieste: Università degli Studi di Trieste
- Hansford, D., Collins, D. (2007). *Anamorphic 3D geometry*. *Computing* 79, 211–223
- Iurilli, S. (2014). *Trasformazioni geometriche e figure dell'architettura. L'Architectura Obliqua di Juan Caramuel de Lobkowitz*. Florence: Firenze University Press, pp. 47-48.
- Maignan, E. (1648). *Perspectiva Horaria, sive de horographia gnomonica tum theoretica tum pratica, libri quatuor*. Rome
- Migliari, R. et al. (1999). La Costruzione dell'architettura illusoria. *Strumenti del Dottorato di Ricerca in Rilievo e Rappresentazione dell'Architettura e dell'Ambiente, Università di Roma "La Sapienza", Dipartimento di Rappresentazione e Rilievo*. Rome: Gangemi Editore
- Naitza, S. (1980). Tra regola e licenza: considerazione sulle prospettive anamorfiche. In: *La prospettiva rinascimentale: codificazioni e trasgressioni*. Florence: Centro Di
- Niceron, J. F. (1638). *La perspective curieuse ou magie artificielle des effets merveilleux*. Paris: P. Billaine
- Niceron, J. F. (1646). *Thaumaturgus opticus*. Paris
- Panofsky, E. (1927). *Die Perspektive als "symbolische Form"*. Teubner: Leipzig-Berlin
- Pozzo, A. (1693). *Perspectiva pictorum et Architectorum*. Rome
- Ravnik, R., Batagelj, B., Kverh, B., Solina, F. (2014). *Dynamic Anamorphosis as a Special, Computer-Generated User Interface*. *Interacting with Computers*, Vol. 26 No. 1 (2014): 46-62
- Toffanello, D. (1996). *Anamorfoosi, l'immagine improvvisa*. Milan CittàStudi
- Varini, F., Lopez, F. (2004). *Points of View*. Zürich: Lars Muller Publishers.