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**DESIGN AGAINST CRIME AS SOCIALLY RESPONSIVE THEORY AND PRACTICE**Gamman L., Thorpe A. - *University of the Arts London (GBR)*

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The first focus of the paper is to define, describe and illustrate 'design against crime' as a socially responsive design movement, differentiating and explaining the socially responsive design approach from that of the movement that calls itself socially responsible design. The aim is to widen discussion about ethical approaches designers, architects and engineers can take in order to help design out crime from society. In the second half of the paper we will focus on the socially responsive practice of Vexed Generation across several design territories including fashion, accessories and design for mobility.

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**VISUAL SENSITIVITY: COMMUNICATING POOR QUALITY**Forslund K., Dagman A., Söderberg R. - *Chalmers University of Technology (SWE)*

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Visually perceived deviations from the nominal shapes, locations and orientations of parts can have negative impacts on the Visual Quality Appearance (VQA) of an assembled product. What deviations can be allowed without having extensive negative impacts on the VQA depends on the visual sensitivity of the design concept. Visual sensitivity has been defined as a product's ability to visually amplify or suppress the lack of quality that could be visually perceived by a customer, due to geometrical variation. In this paper, we present and discuss visual sensitivity as a product property. Furthermore, we will regard visual sensitivity as the extent to which the nominal geometry of a product is communicated to an observer.

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**DESIGNER EVOLUTION: A STORY OF RECONCILIATION BETWEEN CREATIVITY AND RESEARCH IN INDUSTRIAL DESIGN**Arnold J.W. - *The Ohio State University (USA)*

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The industrial design profession in the United States has evolved over the past 50 years. This evolution has included a shift to a research based practice of industrial design from an art/intuitive based practice. Industrial designers have been conducting their own kind of design research for at least the last 50 years, and collaboration with other disciplines has produced improved research methodologies that satisfy the needs of: fast paced product development, credibility, and creativity. The creative process can be enhanced rather than stifled by research. This evolution and growth of research based design has been observed through an extensive literature review and in-depth interviews with key figures in design research history.

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**AN ACTIVITY MODEL AS A TOOL FOR ANALYZING COMMUNICATION IN ENGINEERING DESIGN**Chartier J., Prudhomme G., Boujut J.F. - *Institut National Polytechnique de Grenoble (FRA)*

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The research focuses on remote co-operative work and particularly the study of group work sequences during design meetings. We make the assumption that remote synchronous design can be described by the two groups of activities (communication and product modelling). The aim of communication activities is to help the designers to build a common understanding of the present situation. We will present a case study related to remote project reviews within the Volvo Group. We will introduce the concept of activity and propose a classification in relation to the literature. This theoretical framework will then allow the analysis of the case study. It will reveal the evolution of a specific object including graphics and textual annotations.

**THE INFLUENCE OF CONSUMER RESEARCH ON PRODUCT AESTHETICS**Crilly N., Clarkson P.J. - *University of Cambridge (GBR)*

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Although consumer research activities are often described in relation to functionality and usability, the influence of consumer research on product aesthetics has received comparatively little attention. To address this issue, a qualitative study was undertaken exploring the influence of consumer research on the visual form of products. After describing the nature of the study, this paper outlines the process of consumer research as it applies to design. There then follows discussion of how consumer research directly influences product aesthetics and how it exerts further influence by shaping the politics of designer-client relationships. Finally, there is discussion of the barriers that prevent or limit the application of consumer research and the challenges that are encountered in applying its findings to the aesthetic aspects of design.

**A MODEL OF HUMAN SENSATIONS AS A BASIS FOR 'DESIGN FOR PRODUCT-EMOTION' SUPPORT**Fenech O.C., Borg J.C. - *University of Malta (MLT)*

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User-product interaction is an emotional experience and products are nowadays being designed to address this emotional experience. Emotion-driven design is however a highly intricate activity, since emotions are idiosyncratic. For the more, the lack of design knowledge in the 'design for emotion' field makes such a design task even more complex. This paper presents new design knowledge being developed via an ongoing research project by the name of DemoHS which is aimed at investigating the role of senses as a basis for developing the required 'design for product-emotion' support. The DemoHS model of product-emotions, the theory leading to its development and the preliminary results collected during its initial testing are also analysed.

**WHAT THEY REALLY, REALLY WANT: USER CENTERED RESEARCH METHODS FOR DESIGN**Lofthouse V.A., Lilley D. - *Loughborough University (GBR)*

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The paper draws on the combined experiences of the authors with findings from the literature to present a range of user centred research techniques. These techniques can be used by designers to better assess the needs and desires of the customers they are designing for; reduce the potential for poorly designed or misused products; and act as a persuasive tool for communicating wants and needs to higher management. The paper concludes by comparing the different cost and time implications of the different methodologies presented and suggests how they can be combined together for effective use.

**DIGITAL HUMAN BODY MODELLING TO SUPPORT DESIGNING PRODUCTS FOR PHYSICAL INTERACTION**Moes N.C.C.M. - *Delft University of Technology (NLD)*

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In order to build a Digital Human Model (DHM) to be applied in designing products for physical interaction, knowledge is needed from several sources, depending on the intended application of the model. This paper conceptualises a solution for creating such a DHM. It is based on morphological, behavioural and artefact modelling. The concept is based on several knowledge engineering actions, that convert available knowledge to a higher level of abstraction, and make it suited for incorporation in a DHM. The paper concludes with an example for designing the shape of a seat.

**TRANSFER OF DESIGN TECHNIQUES FOR THE DEVELOPMENT OF COMPLEX NATURAL FORMS IN STEEL - A CASE STUDY**Lewis A., Murphy D.S., Tomlin M.C. - *University of Wales Institute (GBR)*

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The introduction of an industrial design graduate into a steel fabrication company in the UK not only brought fresh ideas for new products but also new design methodologies. In particular the introduction of design visualisation CAD packages has allowed the company to develop new products in a way that standard 2D and 3D drafting software could not. This paper discusses how the use of surface-modelling CAD software, usually intended for film and graphical applications, was harnessed to provide an innovative and cost-effective way to visualise and develop steel tree-masts. The paper will also highlight how the successful integration of methodologies from a variety of design disciplines can raise awareness of the benefits of this approach.