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**On the Relationship Between the Shear Forces in Human Skin and the Grain Direction of Woven Fabric**

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**CUTTER – DESIGNER – CUTTER: CUTTING AS DESIGN**

As the title suggests, the fashion design process is an interactive one, dealing with the body as the primary site for investigation, where the designer and cutter (in this case creative toile-ist) work in collaboration to develop the designer’s initial concept. This keynote is a joint examination of the both the designer and pattern cutter’s working process in the designing of clothing.

**Shelly Fox**

**Donna Karan Professor of Fashion and Director of the MFA Fashion Design and Society Program**

**Parsons: The New School for Design, New York**

**Juliana Sissons**

**Designer and Senior Lecturer in fashion knitwear**

**and pattern cutting**

**Nottingham Trent University and University of Brighton**

**Elizabeth Carr,** Kent State University

**Linda Ohrn-McDaniel,** Kent State University

**Archana Mehta,** Kent State University

**Changing Perspectives in the Patternmaking and Draping Classroom**

How do we best take advantage of digital tools in the patternmaking and draping classrooms? The hands on nature of these topics often make us favour traditional demonstration approaches. However, what if digital tools could help us change the student’s perspective? What if we could give the student the opportunity to experience the demonstration from the same perspective as the patternmaker/draper rather than viewing it from an opposing vantage point? Through this study we are looking at how the students understanding and success in the classes are improved through a new perspective of the demonstration. In order to obtain this new viewpoint we have created a demonstration situation where the student is placed in the position of the expert through digital recordings placing the camera perspective from that of the instructor. The focus is to give the student the opportunity to experience the demonstration through the eyes of the expert in order to get a more realistic perspective.

**Greg Climer,** Parsons: The New School for Design

**Parsons New Curriculum**

In 2013 Parsons launched a new curriculum, which has cross--‐disciplinary work, creative making and reflective practice underpinned by research at the core. The curriculum is a restructuring of the traditional Bauhaus design education. Traditional Bauhaus design education involves one foundation year followed by three years in a selected discipline. Parsons has shifted to a four--‐year structure that updates the Bauhaus model for the new challenges modern designers face. In My roles as a departmental coordinator, associate director of first year education and as a teacher I observe a shift in the way fashion students approach design challenges. This paper will compare these observations to a broader study of the Students in the “new curriculum.” This case study focuses on the how the changes in curriculum have impacted on the student experience, particularly how students approach pattern cutting and design as a symbiotic relationship. The case study uses interviews with students and faculty and a study of the internal annual curriculum assessment.

**Tacit Magic: Understanding the Principles Behind Nakamichi's Creative Pattern Cutting**

Tomoko Nakamichi is globally renowned for her creative pattern cutting techniques presented in the Pattern Magic books (2010, 2011, & 2012). The goal of this research inquiry was to uncover tacit knowledge in Nakamichi’s techniques. Understanding the tacit principles behind her patterns may inspire pattern cutters to create innovative techniques and designs. Researchers conducted a structured inquiry into 50 different patterns in the Pattern Magic books to create a framework of principles. Each pattern was drafted, the principles contained therein analyzed and then applied in a new garment location to test the principles’ universality. Our inquiry began with traditional block-based pattern cutting principles of Joseph-Armstrong (2010): Dart Manipulation, Added Fullness, and Contouring. In addition to creative uses of these, we found principles which we termed: Adding 3D Geometric Shapes, Creating Shape through Extensions, Extending 2D Shapes from Seams, Geometric shapes become 3D with the Body Inserted, and Versatility by Design.

**Emma Grain,** University of Huddersfield

**3d Printing: Virtual Draping the New Moulage**

This practice-based enquiry aims to examine design and manufacturing possibilities using 3D CAD and 3D printing and to systematically test a range of materials in order to establish those appropriate for 3D printing fashion. The feasibility of draping and sculpting materials virtually onto the body using Rhino (3D CAD software) will be explored. Unlike former virtual 3D modeling where a pattern could be made from the draped fabric on an avatar, this enquiry will explore whether printing the material directly from the software can eliminate the need for traditional pattern cutting in this process. Since 2012 3D printing has emerged as a new method of manufacture for clothing. This is mainly evident in experimental sculptural forms for women. Working in collaboration with 3D Systems (the founding company of 3D printing), will ensure precise and well-informed results and these will be fed back through this investigation.

**Lee Harding,** Birmingham City University

**Abstract Approaches to Creative Cutting**

 “I think perfection is ugly. Somewhere in the things humans make, I want to see scars, failure, disorder, distortion.” – Yohji Yamamoto

This project evaluates the effectiveness of new creative cutting methods used with second year undergraduate students. Historically learners are increasingly found to be lacking in confidence with regards to three-dimensional exploration and technical realization that enables them to forge an individual design aesthetic. The study embarks on reviewing a series of workshop that focus on garment distortion, exploding and projection techniques. The practical workshops encourage learners to forge a new perspective to three-dimensional thinking and understanding, not traditionally found through conventional flat pattern cutting methods. The research will reflect upon case studies and practical sessions that build the confidence of the learner by offering different and dynamic new approaches and to foster a new relationship with 3D design. The key focus of the workshops is the breaking down of pre-established concepts and boundaries surrounding dress, thus challenging students to form a new aesthetic. Through the project I hope to ascertain if the sessions have a lasting impact of the learning experience of the undergraduate design student.

**Laura Hardingham,** Robert Gordon University, Gray’s School of Art

**How Can a Box Become A Garment**

This paper analyses fashion students pedagogical understanding of three dimensional pattern making and garment construction through the project How Can a Box Become a Garment, a project implemented as an alternative novel approach for students new to pattern construction in how to transform 2D material into a 3D garment creating unconventional shape and form.  Using flattened boxes, as a substitute for pattern pieces and working in pair’s students were briefed how there was no right or wrong response, but rather to focus on creating interesting 3D form.  Working with a minimum of two boxes cut out in calico students were encouraged to progress organically alternating between stitching random edges together and analyzing the resulting shape on a mannequin until they felt their garment was complete.  The research gathered for this paper highlights how alternative teaching approaches to creative pattern cutting can be complimentary to traditional pattern construction skills, in particular to students who find this area challenging.

**Kiwy Huang,** London College of Fashion

**Computational Fashion – The Digital Approach to Pattern Making**

Despite advancing software technology, this has not significantly improved the efficiency of pattern making, whereas fabric draping simulation, catwalk presentation simulation software has been a primary focus of various software firms. This research project aims to implement an innovative digital approach to the pattern making process in fashion design. Main approach is to visualize the designed garment (combinations of front, side and back technical drawings) in a three dimensional environment then unwrap the three dimensional model to flat two dimensional pattern blocks. By utilizing software technology and implementing mathematical algorithm, this project is aiming to improve production efficiency and economic compatibility for fashion designers. This project also discusses the importance of pattern making knowledge and expertise to the fashion industry. It does not encourage the pattern making process to be entirely replaced and conducted by software.

**Rickard Lindqvist,** The Swedish School of Textiles

**On the Relationship Between the Shear Forces in Human Skin and the Grain Direction of Woven Fabric**

The prevalent utilization of the grain line vertically in pattern cutting is arguably connected to the tailoring matrix, the theoretical approximation of the body that is derived from horizontal and vertical measurements of the body in an upright position. As woven fabric generally is anisotropic i.e. rigid on the straight grain and flexible on the bias this utilization lack of dynamic qualities in interaction with the moving body. Langer’s lines utilized in surgery denote the skins anisotropic qualities and is thus also a notation of the movements of the body. Through concrete experiments by cutting and draping fabrics on live models guided by Langer’s lines this research explores and defines possible congruence’s between the shear forces of human skin and the anisotropic qualities of woven fabric. Suggesting, through a number of garment prototypes, how the utilization of fabric grain may shift across the body.

**Holly McQuillan,** Massey University College of Creative Arts

**Print as Encoded Way Finding a System for the Creation of**

**Garment Form**

This paper discusses MakeUse, a multi-disciplinary research project exploring ‘User Modifiable Zero Waste Fashion’. In particular, it addresses the use of colour, line and pattern to facilitate the cognitive and creative processes involved in the transformation from two-dimensional to three-dimensional form. The MakeUse project centres around the development and testing of an embedded navigational system by which users can formulate a functional understanding of the form and construction of a garment and its opportunities for manipulation. It questions how the encoding of navigational clues and markers into a garment might aid in its facility for creation and modification by the user, thereby enhancing emotional investment and connection, and extending its functional life. This paper specifically explores the interplay between textile mark making and garment form creation.

It outlines the advantages this symbiotic relationship can have for the facilitation of understanding and risk taking in the context of collaborative textile and zero waste fashion design.

**Brianna Plummer,** Framingham State University

**Scaffolding Creative Pattern Cutting throughout the Traditional Patternmaking Curriculum**

Building on previous research focusing on the pedagogical presentation of creative alternatives to traditional patternmaking within an undergraduate fashion design program, this paper explores the potential benefits of introducing creative pattern cutting techniques earlier in the university curriculum. Today’s students may not be familiar with customary paper patterns. How much traditional patternmaking knowledge is needed to provide the foundational skills required for successful creative pattern cutting? Is it possible for the patternmaking novice to be more conceptually creative in zero-waste designs, reverse engineering, up-cycling, and Japanese-style pattern cutting even though their abilities to execute the design may not be advanced? Through a new special topics course comprised of students with various design, construction, and patternmaking skills this research investigates the creative decisions and innovative applications to propose a scaffolding framework of when to introduce and experience creative pattern cutting throughout the curriculum to enhance creativity in all aspects of design.