Body-Cut-Space (Cut-Body):

Enhancing Innovation using Spatial and Fashion Design Paradigms Collaboratively.

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Abstract: The work of many spatial designers[1] continues to be predicated on, and limited by, orthogonal typologies and rigid, planar construction, whilst fashion designers frequently explore experimental approaches to 3D modelling on the stand.   However, spatial and fashion designers from the UK's University of Bedfordshire have devised a methodology that uses techniques and approaches from both these disciplines collaboratively to stimulate different ways of thinking and lead to innovative results.   These techniques and approaches include creative pattern cutting, folding architecture, mapping, and (from Deconstruction in spatial and fashion design respectively), cross-programming and undoing and making.   Through the use of this innovative methodology, the design outcomes begin as spatial, but this collaboration is a symbiotic process that also transforms fashion outcomes.

Key words: Spatial Design, Fashion Design, Deconstruction, Creative Pattern Cutting, Design Innovation, Mapping

1. Introduction

Because of recent developments in construction technology and computer aided design (CAD), the potential to create innovative spaces and forms which offer radical responses to functional needs has arguably never been greater.   However, the work of many spatial designers continues to be predicated on, and limited by, orthogonal typologies [19, 20] and rigid, planar construction [7].   Meanwhile, fashion designers frequently work in 3D by draping fabrics on the mannequin – a practice that has remained largely unchanged for years.   At the UK's University of Bedfordshire, a team of spatial design and fashion design practitioners has devised a methodology that uses techniques and approaches from both these disciplines collaboratively to stimulate different ways of thinking that can lead to innovative results.   This paper showcases the work of these practitioners, beginning by explaining the rationale to their new design methodology, and following this by discussing its theoretical underpinning and showcasing the results of a pilot study.   The methodology has four phases.   This paper focuses on the first three, and looks forward to the final phase that the authors intend will be the subject of further publications.

2. Rationale

As was argued above, the potential to create innovative spatial design proposals, which offer radical responses to functional needs, has never been greater.   However, there is evidence that many spatial designers continue to

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[1] For the purposes of this paper, "spatial design" is used as shorthand to denote a range of disciplines that are concerned with the design of the built environment, including Architecture, Interior Architecture, Landscape Architecture, Interior Design and

be bound by orthogonal typologies (for example, the horizontal and vertical plane, the grid, the plan extrusion) and rigid, planar construction (for example, the board, the panel, the tile and so on).   Indeed, Salingaros discusses typological development in terms of "Darwinian" [19] evolution, and refers to "geometrical fundamentalism" [20], whilst "[p]hysical limitations of construction materials and fabrication constraints can place undesirable restrictions on the freedom of architectural design.   Usually the basic building materials are selected early in an architectural design process and can have significant impact on the shapes and styles that may be considered" [7]. It would appear that there is a need to transcend these boundaries.   Paper-based freehand sketching is still regarded to be a powerful tool for expediting this [22, 23, 8, 25, 18] but its use appears to be declining amongst design undergraduates [22, 23] and, although there is some evidence that spatial designers can work creatively using mental imaging [2], this does not appear to offer a valid response to that decline.   Digital design software can clearly help lead to innovative outcomes, but there is evidence that it is creating an unhelpful separation between the designer and the maker [24], and it is the authors' experience that software which supports cutting-edge spatial innovation is not widely used by undergraduates.   Fashion design and spatial design have for several years explored overlapping paths to innovation [27, 10].   Both disciplines address the need to create space and form from flat materials and, "…with the aid of new technologies and materials, each has been able to develop shared techniques that provide texture, form and volume in new and intriguing ways, often introducing shapes and silhouettes that confound conventional ideas of proportion and form" [11].   Moreover, construction techniques are crossing boundaries between both disciplines.   For example, "[a]rchitects are looking to fashion and the techniques of dressmaking, such as pleating and draping to achieve more fluid and complex forms out of hard materials" [12].   The methodology being introduced in this paper finds new opportunities in this shared spatial design:fashion design territory, by bringing together a number of theoretical standpoints from Deconstruction, mapping, folding architecture and creative pattern cutting.

3. Theoretical Underpinning

Deconstruction in spatial design (known in the USA as Deconstructivism [3]) has been written about extensively in the last thirty years [4, 6, 17, 30, 5, 21, 14].   It is not the authors' intention here to revisit those texts except to highlight what they see as key fundamentals that relate to the concerns outlined above because they enable the following spatial design commonplaces to be challenged: the functional imperative; conceptions of what is and is not aesthetically pleasing; and acceptable notions of materiality.   Of particular interest is architect Bernard Tschumi's attempt to deconstruct the brief through **"Crossprogramming:** Using a given spatial configuration for a programme not intended for it, ie: using a church building for a bowling alley…" [22 – authors' use of bold text].

This new methodology is also informed by the investigations into **folding architecture,** showcased by Greg Lynn in *Architectural Design* [27], that were seeking a substitute for the complex rationality of Deconstruction. Lynn linked these investigations to Gilles Deleuze's examination of the Baroque, and argued that they stimulated a range of conceptual approaches to spatial design, including "…continuous surfaces, landforms, [and] curvilinearity…" [28].   A key element of this approach is that "…there is a tension between the digital and the analogue which has revamped the value of the artifact" [29], thereby allowing fashion design methods to be used directly.

Another component of this methodology, from a spatial design perspective, is the use of a narrative-based tool for analysis of design contexts, which the authors, in common with other UK spatial design academics, term **mapping.** This requires the practitioner, *inter alia,* to spend time within the context absorbing information empirically and documenting findings by means of drawings, photographs, videos and so on. A key tenet of mapping is that the design brief or programme emerges from the context rather than being imposed on it *a priori.*

Gill [9] describes Deconstruction in fashion design as the liberation of clothing and the removal of the concept of function, re-evaluating the garment's purpose in relation to the body and the context in which it is worn. This perspective has directly informed the work of a number of fashion designers, including Issey Miyake, Rei Kawakubo, Yojhi Yamamoto and Martin Margiela [13]. Whereas some fashion designers might be connected to Deconstruction by analysis of the garment's finish, Margiela [9] explores the process of **undoing and making** which is a key component of this methodology.

Creative pattern cutting also offers an experimental approach to garment design. However, whilst Deconstruction is concerned with taking a garment apart and putting back together in a different way [9, 13], creative pattern cutting explores the boundaries and limitations of fabric, form and pattern cutting methods to enable innovation to take place within these existing limitations [1]. Unsurprisingly, there are often crossovers with the two approaches of Deconstruction and creative pattern cutting. Both bring innovation to fashion concepts, but, more importantly, both blur the boundaries between designer and pattern cutter [1] – traditionally, these two roles have been seen as separate, appreciated for their individual skill.

This methodology is not the first example of pattern cutting being applied outside of the garment. Block Party, a collective of pattern cutters and artists exploring the boundaries of 2D and 3D form, exhibited ideas of pattern cutting being applied to art in the *Beyond Garment* exhibition in 2012 [16]. This exhibition allowed artists and designers to apply pattern cutting to their own disciplines in order to innovate through inter-disciplinarity. More directly, as far as this methodology is concerned, the *Skin+Bones: Parallel Practices in Fashion and Architecture* exhibition in 2008 [10] explored the close relationships between fashion and architecture, noting the distinct correlation between shelter, body and space, and their origin from the 2D. The exhibition also reinforced the proposal that architecture will need to challenge traditional materials to allow for innovation, responding to both ecological and humanitarian needs.

The collaborative spatial design:fashion design methodology that is the focus of this paper seeks to bring together **cross-programming (**from Deconstruction in spatial design), **undoing and making (**from Deconstruction in fashion design), and **mapping** and **folding architecture from** spatial design, plus **creative pattern cutting** from fashion design, in a pioneering way by creating an interface between function, form and materiality in order to foster the discovery of innovative outcomes.

4. Method

The design process begins with a team comprising at least one fashion designer and one spatial designer, and demands equal input from both disciplines. It has four phases:

Phase 1 requires a move from a fashion domain into a spatial domain, and is directed by the fashion designer/s. It begins with a basic block shift dress being placed on a mannequin. The shift dress is made as a calico toile[2]

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[2] Toile: a French word referring to a canvas cloth, in a pattern making context a toile is a development garment or 'mock up'

with all conventional seams and darts[3].   The team decides on a keyword to give creative direction to their design speculations.   Using a pen and inspired by this keyword, the team draw new style lines, grainlines and numbered notches[4] directly onto the garment.   This method of designing in 3D can be linked to creative pattern cutting techniques used by Tomoko Nakamichi [15] which offer "…unmediated experimentation with immediate physical effects" [29].   Once marked out with all required information, the team remove the garment from the mannequin, cut along the new style-lines and lay out the resultant patterns onto a flat surface.   At this stage the pieces will not be made back into a garment as would traditionally follow.
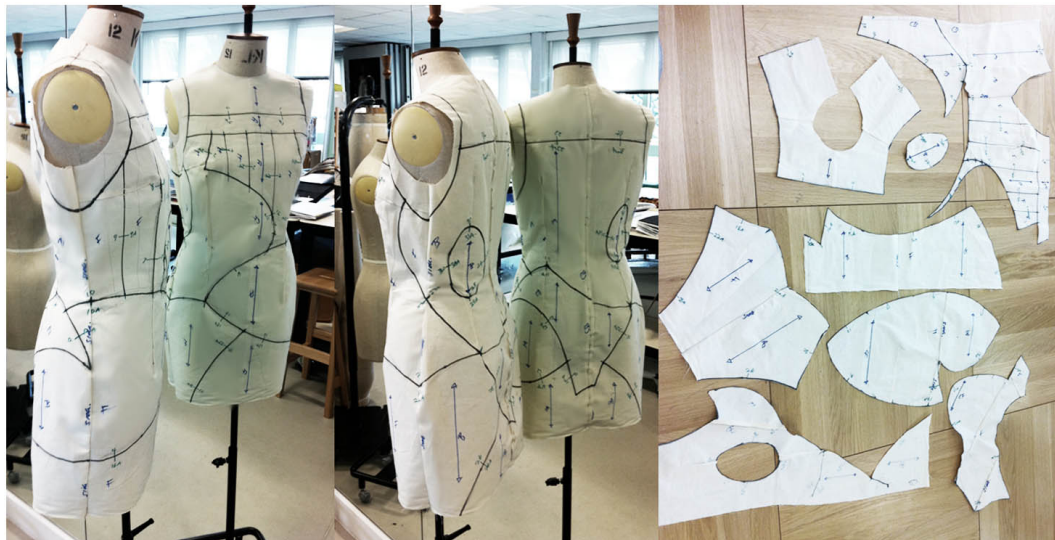

Figure.1 Marking up the garment

Phase 2 draws on the expertise of the spatial designer/s.   The first intervention resulting from this collaboration has a context: a physical location inhabited by users with a range of physical, emotional and spiritual needs.   The team carries out a series of **mapping** exercises within that physical location to enable them to find inspiration that is both contextualized and unexpected.   This inspiration will form the beginnings of the spatial design brief or programme.

Phase 3 requires the team to consider the **mapping** data obtained, their keyword, and the deconstructed patterns they produced from the original shift dress; to apply **cross-programming** methods to the generation of new spatial and functional possibilities; and to seek to develop, by toiling and re-toiling the 3D form/s in an iterative, experimental and reflective manner, an outcome that brings that garment to the spatial domain.   The result is a kind of **folding architecture** with function following form rather than form following function. Neither the fashion designer/s nor the spatial designer/s take a lead role – indeed, it is the authors' experience that their methodology benefits from each practitioner toiling her/his own form to begin with, and bringing to it different sensibilities – more surface-based in the case of fashion design, more 3D in the case of spatial design –

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in a cheaper fabric to resolve a design before making in a final fabric.

[3] A dart is a seam sewn into a garment to make the fabric fit the body and create the 3D form.

[4] A notch is a cut indication on the seam of a pattern piece to show where two pattern pieces should meet. Notches help the garment machinist to make the garment from the various pieces of fabric.

that can then be used to inform subsequent collaborative practice. Sewing is eliminated from the toiling process; instead, the collaborators use an adhesive to connect the seams, thus enabling a spontaneity that would not have been achieved if the spatial designer had had to learn new skills such as sewing/garment construction.

Figure.2 Considering the patterns

Phase 4 requires that, once the spatial design intervention has been completed, it is transformed back to a garment, but working not from a mannequin located within a fashion studio but rather from within the intervention's current location in a spatial context, and following analysis of it within that context. This requires a return to the use of **creative pattern cutting** and **undoing and making,** combined with the new spatial design function**,** and is led by the fashion designers. It results in a fashion outcome that is unprecedented because it has emerged from a new design methodology.

5. Methodology in Practice:

During the pilot study, Phases 1 to 3 of this methodology were instigated and evaluated. The results showcased here should be seen as just one example of what can be produced. The pilot study began with a **deconstruction, creative pattern cutting** and **mapping** exercise, as outlined above, in a UK-based building. This exercise was informed by the keyword "confront", and it revealed a number of negative emotional responses to the building's barrier access control system that suggested a number of design deficiencies: users confirmed that they were frightened of being injured by the barriers, or found them uninviting and unwelcoming, or regarded them as difficult to use. This led the team to apply the collaborative spatial design:fashion design methodology to explore ways of evaluating and reinventing barrier access. The toiling resulted in new forms – based on twisted seams, non-geometric patterns, folding structures and so on – and these prompted the team, using **cross-programming,** to think spatially and metaphorically in new ways, proposing design interventions that could embrace, grip, stroke – or even tickle – the user rather than harming or scaring him/her. Possible artifacts that were speculated on as result of this included an airbag that could inflate suddenly to prevent non-permitted ingress, or jets of air that could provide an almost completely non-physical barrier. However, it should be stressed here that these speculations are not what this methodology – or this paper – are about, they are examples of spatial

design possibilities that will need to be explored further using a range of design methodologies – for instance, paper-based freehand sketching, model-making and continued use of this collaborative method.

Figure.3 Working collaboratively

6. Results:

In the authors' opinion, this pilot has revealed a successful new design methodology: through a collaborative process, a garment was deconstructed, mapping was carried out, and new insights were gained into form, materiality and function which led to potentially innovative spatial outcomes.

However, the pilot also revealed unexpected results. For example, whilst creating their own toiles using identical fabric pattern pieces/shapes, the spatial designer and the fashion designer started to express their own creative disciplines, the former making tighter, space-enclosing structures, and the latter a surface that could easily be used as a textile. This realization – and, implicit within it, the realization that the inputs of the spatial designer and the fashion designer were both equal during this phase – has added another facet to the methodology and holds the potential for a more focused investigation in future publications.

For the authors, the biggest surprise, however – and the biggest challenge – resulted from exporting the new fabric forms into the real-world spatial context. This was because the scale of the context did not equate with the scale of the forms, and it became apparent that there was a need to reconsider materials and construction techniques, and perhaps, to introduce other skill-sets as part of the visualizing process: for example, as a fashion designer might toile as a main source of design development, such visualizations at an increased scale might become difficult through the process of toiling alone, leading to analysis and reconsideration of materials. Responding to these challenges needed a longer timeframe to than had been predicted originally.

7. Conclusions and Recommendations:

This paper has introduced a new four-phase design methodology that not only attempts to explore innovation in a spatial design domain but also transcends the boundaries of traditional fashion design paradigms. Fashion designers have learnt that creative pattern cutting can be applied beyond the body, not just to introduce a new

aesthetic, but to apply a function to a design rather than designing to meet the needs of function. Spatial designers have learnt ways of generating new forms and exploring new functions.

This design methodology has been devised and piloted at the UK's University of Bedfordshire and the results of Phases 1, 2 and 3 were exhibited on campus in April 2013. **Cross-programming** and **undoing and making** (from Deconstruction in the fields of spatial design and fashion design respectively), **mapping** and **folding architecture** (from spatial design), and **creative pattern cutting** (from fashion design) have all transformed their respective disciplines. This design methodology links them and moves them from one discipline to another (and back again).

The pilot revealed unexpected results - for example, that the spatial designer and the fashion designer started to express their own creative disciplines in the toiles they made, and that exporting the new fabric forms into the real-world spatial context was a significant challenge because the scale of the context did not equate with the scale of the forms. These findings will be explored in more detail during subsequent iterations of this research project.

However, in the authors' opinion, this pilot also revealed a successful new design methodology. Through a collaborative process, a garment was deconstructed, mapping was carried out, and new insights were gained into form, materiality and function that led to potentially innovative spatial outcomes.

The next stage in this research is to explore the application of Phase 4: once the spatial innovation is complete, it is re-evaluated and reinvented as a garment. What is important to note is that the spatial innovation does not just inspire the design of the garment but will be deconstructed into the garment, completing the design cycle. The authors intend that the work resulting from this will be discussed in subsequent publications.

8. References

[1] Almond, K. and Brennand, K. (curators) (2012) *Insufficient Allure: The Art of Creative Pattern Cutting.* Exhibition at Huddersfield Art Gallery, Huddersfield, April-June.

[2] Bilda, Z., Gero, J. S., Purcell, T. (2006) *To Sketch or not to Sketch? That is the Question,* Design Studies, September 2006, vol. 27, no. 5, pp 587-613.

[3] Broadbent, G. (1991) *Deconstruction: a Student Guide,* Academy Editions, London, p 11.

[4] Broadbent, G. (1991) *Deconstruction: a Student Guide,* Academy Editions, London, p 12.

[5] Broadbent, G. (1991) *Deconstruction: a Student Guide,* Academy Editions, London, p 67.

[6] Coyne, R. (2011) *Derrida for Architects,* Routledge, Abingdon.

[7] Cutler, B. and Whiting, E. (2007) *Constrained Planar Remeshing for Architecture,* Graphics Interface 2007, Montreal, Canada, pp 11-18.

[8] Dulaney Jr., R. and Lyn, F. (2010) *Representational Craft and Production: Comparison of the Value of Hand Drawing and Digital Media in Architectural Academies and Practices,* Design Principles and Practices: an International Journal, vol. 4, no. 1, pp 281-291.

[9] Gill, A. (1998) *Deconstruction Fashion: The Making of Unfinished, Decomposing and Re-assembled Clothes,* Fashion Theory, vol. 2, no. 1, Oxford:Berg, pp 25-50.

[10] Hodge, B. (curator) (2008) *Skin+Bones: Parallel Practices in Fashion and Architecture.* Exhibition at Somerset House, Museum of Contemporary Art, Los Angeles, April-August.

[11] Hodge, B. (curator) (2008) *Skin+Bones: Parallel Practices in Fashion and Architecture.* Catalogue of exhibition at Somerset House, Museum of Contemporary Art, Los Angeles, April-August, p 19.

[12] Hodge, B. (curator) (2008) *Skin+Bones: Parallel Practices in Fashion and Architecture.* Catalogue of exhibition at Somerset House, Museum of Contemporary Art, Los Angeles, April-August, p 30.

[13] Kiziltunali, G. (2012) *A Deconstructive System: Fashion.* Available at: <http://www.inter-disciplinary.net/critical-issues/wp-content/uploads/2012/08/kiziltunalifashpaper.pdf> [Accessed 6 February 2013].

[14] Morgan, M. (2007) *Derrida's Garden.* Available at Fillip <http://fillip.ca/content/derridas-garden> [Accessed 8 March 2013].

[15] Nakamichi, T. (2010) *Pattern Magic,* Laurence King Publishing Ltd, London.

[16] Orta, L. (curator) (2012) *Beyond Garment. Exhibition at New Walk Museum and Art Gallery,* Leicester.

[17] Papadakis, A. (1988) *Deconstruction in Architecture*, Architectural Design, vol. 58, no. 3-4.

[18] Prats, M., Lim, S., Jowers, I., Garner, S. W. and Chase, S. (2009) *Transforming Shape in Design: Observations from Studies of Sketching,* Design Studies, vol. 30, no. 5, September 2009, pp 503-520.

[19] Salingaros, N. (2006) *A Theory of Architecture,* Umbau-Verlag, Solingen, p 18.

[20] Salingaros, N. (2006) *A Theory of Architecture,* Umbau-Verlag, Solingen, p 172.

[21] Salingaros, N. (2008) *Anti-Architecture and Deconstruction,* 3rd Edition, Umbau-Verlag, Abingdon.

[22] Schenk, P. (2005) *Reflections on the Teaching of Drawing in the Digital Age: Attitudes of Senior Academics in the United Kingdom to the Place of Drawing Tuition on the Design Curriculum in Higher Education,* Art Design and Communication in Higher Education, vol. 4, no. 3, pp 189-203.

[23] Schenk, P. (2005) *The Why and How of Drawing: a 20 Year Shift in Design Procedures and Priorities,* Proceedings of European Academy of Design Conference, Bremen, Germany, Section 080, pp 1-11.

[24] Sheil, B. (2012) *Distinguishing between the Drawn and the Made,* Architectural Design, John Wiley and Son, vol. 82, no. 2, pp 136-141.

[25] Stones, C. and Cassidy, T. (2010) *Seeing and Discovering: How do Student Designers Reinterpret Sketches and Digital Marks during Graphic Design Ideation?,* Design Studies, vol. 31, no. 5, September 2010, pp 439-460.

[26] Tschumi, B. (1988) *Notes towards a Theory of Deconstruction,* Architecture and Urbanism, no. 216, September 1988, pp 13-15.

[27] Vyzoviti, S. (2008) *Out of the Box and into the Fold.* Available at <http://www.academia.edu/1597561/out_of_the_box_and_into_the_fold > [Accessed 9 March 2013].

[28] Vyzoviti, S. (2008) *Out of the Box and into the Fold.* Available at <http://www.academia.edu/1597561/out_of_the_box_and_into_the_fold > p 53 [Accessed 9 March 2013

[29] Vyzoviti, S. (2008) *Out of the Box and into the Fold.* Available at <http://www.academia.edu/1597561/out_of_the_box_and_into_the_fold > p 55 [Accessed 9 March 2013]

[30] Wigley, M. (1995) *The Architecture of Deconstruction: Derrida's Haunt,* MIT Press, Massachusetts.

[31] Wigley, M. (1995) *The Architecture of Deconstruction: Derrida's Haunt,* MIT Press, Massachusetts, p 35.