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Taylor, Andrew

Investigating the Application of 3D CG Technologies in Fashion Education

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An Investigation into 3D Software Tools for Apparel Design and Construction in a Virtual Environment

Andrew Taylor
HEFCE funded Research Student: 1998-2000
Department of Clothing Design & Technology & Department of Textiles/Fashion
Faculty of Art & Design
Manchester Metropolitan University
Overview

- Starting at the Beginning and Learning new things:
  - body, measurement, clothing, fashion, illustration, pattern design and construction and presentation/merchandising
- Exploring the software available and how it is used in Fashion/Clothing Education and Industry
- Introducing 3D software to learning and teaching
- 3D now
MMU:

RESEARCH OF 3D BODY & MEASUREMENT
Body Measurement
Made-to-Measure Clothing
<table>
<thead>
<tr>
<th>SIZE SYMBOL</th>
<th>SML</th>
<th>MED</th>
<th>LGE</th>
<th>XLGE</th>
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<tr>
<td>BUST</td>
<td>82</td>
<td>88</td>
<td>94</td>
<td>100</td>
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<tr>
<td>WAIST</td>
<td>62</td>
<td>68</td>
<td>74</td>
<td>80</td>
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<td>HIP</td>
<td>87</td>
<td>93</td>
<td>99</td>
<td>105</td>
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<tr>
<td>BACK WIDTH</td>
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<td>34.4</td>
<td>36</td>
<td>37.6</td>
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<td>CHEST</td>
<td>30.6</td>
<td>32.4</td>
<td>34.2</td>
<td>36</td>
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<td>SHOULDER</td>
<td>11.9</td>
<td>12.3</td>
<td>12.6</td>
<td>13</td>
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<td>NECK SIZE</td>
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<td>37</td>
<td>36.5</td>
<td>40</td>
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<td>DART</td>
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<td>7</td>
<td>7.9</td>
<td>8.8</td>
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<tr>
<td>TOP ARM</td>
<td>26.4</td>
<td>28.4</td>
<td>30.4</td>
<td>32.4</td>
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<td>16</td>
<td>16.7</td>
<td>17.4</td>
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<tr>
<td>ANKLE</td>
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<td>24</td>
<td>24.9</td>
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<td>FING'T ANKLE</td>
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<td>NAPE TO WAIST</td>
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<td>41.6</td>
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<tr>
<td>FRONT SHOULDER TO WAIST</td>
<td>39.2</td>
<td>40</td>
<td>41</td>
<td>42</td>
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<tr>
<td>ARMHOLE DEPTH</td>
<td>20.2</td>
<td>21</td>
<td>21.8</td>
<td>22.6</td>
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<tr>
<td>WAIST TO KNEE</td>
<td>57.7</td>
<td>58.5</td>
<td>59.3</td>
<td>60.1</td>
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<tr>
<td>WAIST TO HIP</td>
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<td>20.6</td>
<td>21</td>
<td>21.4</td>
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<td>WAIST TO FLOOR</td>
<td>102.5</td>
<td>104</td>
<td>105.5</td>
<td>107</td>
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<td>BODY RISE</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
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<td>SLEEVE LENGTH</td>
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<td>59.4</td>
<td>60.4</td>
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<td>51.4</td>
<td>52.4</td>
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<table>
<thead>
<tr>
<th>Extra measurements (garments)</th>
<th>SML</th>
<th>MED</th>
<th>LGE</th>
<th>XLGE</th>
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<td>CUFF SIZE SHIRTS</td>
<td>21</td>
<td>21.5</td>
<td>22</td>
<td>22.5</td>
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<tr>
<td>CUFF SIZE, TWO-PIECE SLEEVE</td>
<td>13.5</td>
<td>13.75</td>
<td>14</td>
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<td>TROUSER BOTTOM WIDTH</td>
<td>21.5</td>
<td>22</td>
<td>22.5</td>
<td>23</td>
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<tr>
<td>JEANS BOTTOM WIDTH</td>
<td>18.5</td>
<td>19</td>
<td>19.5</td>
<td>20</td>
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</tbody>
</table>
3D Scanning and construction software developed by government military research
Scanned body data
Dummy Toile, workroom stand....
block is a foundation pattern constructed to fit an average figure.
Identifying the 3D Design development gap in process in fashion / apparel design and manufacture (Fozzard, G & Hardaker, C. 1994)
Sourced from CDI. 1998.
Department of clothing design & Technology, MMU
Gerber Accumark 2D Pattern Design System

Taylor, A. 1998. sourced Screen grab in CAD suite Department of clothing design & Technology. MMU
Corel 6 Dream 3D
Three-Dimensional Illustration Software

Taylor, A. 1999. 3D Texture mapped on 3D Text Department of Clothing Design & Technology. MMU
Poser 2+3+4
The Remarkable Figure
Design and Animation Tool

Taylor, A. 1999. 3D body animation experiments using Poser. Department of Clothing Design & Technology. MMU
Taylor, A. 1999. 2D - 3D. 3d Print experiments using PAD system
Department of Clothing Design & Technology. MMU
Fit for Profit Conference

June 1999

Department of Clothing Design & Technology

Hollings Faculty

Manchester Metropolitan University
AIMS

- To demonstrate the interface between 2D and 3D software applications

- To simulate 2D style developments in a 3D CAD environment

2D-3D PATTERN DESIGN & CONSTRUCTION OF APPAREL IN A VIRTUAL ENVIRONMENT

by Andrew Taylor
Terry Bond
### SIZES

<table>
<thead>
<tr>
<th>To Fit Chest</th>
<th>90 cm</th>
<th>95 cm</th>
<th>100 cm</th>
<th>105 cm</th>
<th>110 cm</th>
<th>5 cm</th>
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<tr>
<td>/ 36&quot;</td>
<td>/ 38&quot;</td>
<td>/ 40&quot;</td>
<td>/ 42&quot;</td>
<td>/ 44&quot;</td>
<td>/ 2&quot;</td>
<td></td>
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<tr>
<td>To Fit Neck</td>
<td>14.5&quot;</td>
<td>15&quot;</td>
<td>15.5&quot;</td>
<td>16&quot;</td>
<td>16.5&quot;</td>
<td>0.5&quot;</td>
</tr>
</tbody>
</table>

| A  | Full Chest & Hips | 106 | 111 | 116 | 121 | 126 | 5cm |
| B  | Half front chest/Hip | 26  | 27.5| 29  | 30.5| 32  | 1.5 |
| C  | Half back chest/Hip  | 27  | 28  | 29  | 30  | 31  | 1.0 |
| D  | Neck buttoned       | 40  | 41.5| 43  | 44.5| 46  | 1.5 |
| E  | Neck Line           | 41  | 42.5| 44  | 45.5| 47  | 1.5 |
| F  | Half front neckline | 13.6| 14.0| 14.5| 15  | 15.4| 0.45|
| G  | Half back neckline  | 6.9 | 7.2 | 7.5 | 7.8 | 8.1 | 0.3 |
| H  | Dropped Shoulder    | 19.4| 19.7| 20  | 20.3| 20.6| 0.3 |
| I  | Half Cross Front    | 22.5| 23.5| 24.5| 25  | 26.5| 1.0 |
| J  | Half Across Back    | 25  | 23.5| 26  | 26.5| 27  | 0.5 |
| K  | Scye Depth          | 28.6| 29.6| 30.5| 31.6| 32.6| 1.0 |
| L  | Length              | 77  | 79  | 81  | 83  | 85  | 2.0 |
| M  | Upper Arm           | 44  | 46  | 48  | 50  | 52  | 2.0 |
| N  | Slv. head depth     | 8.5 | 9.5 | 10.5| 11.5| 12.5| 1.0 |
| O  | Slv. Length & cuff  | 56.5| 58.5| 62.5| 62.5| 64.5| 2.0 |
| P  | Cuff Buttoned       | 20  | 21  | 22  | 23  | 24  | 1.0 |
2D Pad Pattern Design Module

STYLE2: SHORT SLEEVE SHIRT
3D PATTERN SEWING SEQUENCE

PAD System 3D Sample

fig4.sam

Model: Bodice
Working Side: Left and right
Reference: Center Back Up
Center front: Left side on top
Collar: Shirt collar with stand

This model is completely defined.

Cm x: 307.00
y: 80.00
ADDING COLOUR & TEXTURE TO SHIRT STYLE 1
ADDING COLOUR AND TEXTURE TO SHIRT STYLE 2
3D Virtual Sample Model
ADJUSTABLE DIALS FOR SIZING & CUSTOMISATION OF THE 3D MODEL
3D SHIRT SIMULATION WITH PRINT DESIGN MAPPED
3D SIMULATION OF FIT & DRAPE
“..the most straightforward way of taking 2D data and presenting it as 3D data is to use a 3D model.”


3D EXPERIMENTS
2D working drawings

Corel Draw 9 graphics drawing, painting software

Taylor, A. 1999. Department of clothing design & Technology
Fitted trousers with print/textile mapped to pattern in 2D & 3D in PAD SOFTWARE

Taylor, A. 1999. 3D textile mapping experiments Department of clothing design & Technology. MMU
Back bodice drafting measurements

Across back
Centre back depth

Development Animated 3D learning tools using PAD Software

Taylor, A. 1999. 3D textile mapping experiments Department of clothing design & Technology. MMU

Department of clothing design & Technology. MMU
POSER4 AS A LEARNING TOOL
Taylor, A. 1999. 3D Areas of suppression visualisation experiments
Department of clothing design & Technology. MMU

AREAS OF SUPPRESSION FOR BASIC BLOCK PATTERNS

A) Above and under the bust prominence
B) Above and under the shoulder the blade
C) Between underarm and side hip
D) At the elbow or between the elbow and wrist
Taylor, A. 1999. 3D modelling experiments using primitive shapes and Poser software. Department of clothing design & Technology. MMU
Taylor, A. 1999. 3D animation hoodie visualisation. Department of Clothing Design & Technology. MMU
POSER 4 + 3D STUDI O MAX +
MMU:
3D Software
Design Research
1998-2000

FINAL PHASE
EVALUATION OF
GERBER AP3DS
3D -2D DESIGN, FIT &
KES_FABRIC
MEASUREMENT
Taylor, A. 2000. 3D Gerber AP3D-S experiments with 3D-2D pattern
Department of Clothing Design & Technology. MMU
Department of Clothing Design & Technology. MMU
Taylor, A. 2000. Evaluation experiments with Gerber 3D ease and fit tools
Department of Clothing Design & Technology. MMU
Taylor, A. 2000. Experiments with Print Placement In Gerber 3D. Department of Clothing Design & Technology. MMU
MMU:
3D Software Design Research
2000-

FUTURE PHASE
3D Studio Max and ClothReyes collaboration
- Catwalk simulation by
  Thierry Mugler
Virtual Reality: The ultimate future textile design experience?
“If the artist does not perfect a new vision in his process of doing, he acts mechanically and repeats some old model fixed like a blue print in his mind”

John Dewey, (1935) Art as Experience, p. 50

Strauss, A Corbin, J
Basics of Qualitative Research-Grounded Theory Procedures and Techniques
“Minds are like parachutes: they only function when they are open”

Sir James Dewar