



University of HUDDERSFIELD

University of Huddersfield Repository

Taylor, Andrew, Lewis, Linda and Ward, Geoff

Research into 3D Printed Materials & Methods: An exploratory practice based approach into the application of 3D technologies for textile & surface design

Original Citation

Taylor, Andrew, Lewis, Linda and Ward, Geoff (2013) Research into 3D Printed Materials & Methods: An exploratory practice based approach into the application of 3D technologies for textile & surface design. In: Materials Coloration - past, present and future of textile printing, Wednesday 13th February 2013, University of Huddersfield. (Unpublished)

This version is available at <http://eprints.hud.ac.uk/id/eprint/16905/>

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.

<http://eprints.hud.ac.uk/>

Research into 3D Printed Materials & Methods :

**An exploratory practice based approach into the
application of 3D technologies for textile & surface design**

Andrew Taylor-SADA University of Huddersfield Linda Lewis-SADA & Geoff Ward - Assyst Bullmer

MATERIALS COLOURATION: PAST, PRESENT & FUTURE OF TEXTILE PRINTING

Hosted by University of Huddersfield: 13th February 2013

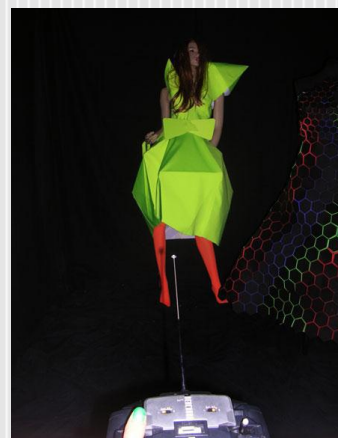
SDC North of England Region & SCI Yorkshire and Humber Group



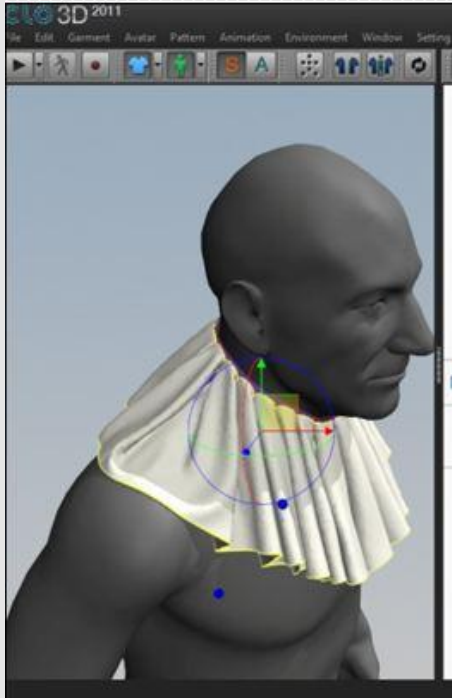
Overview of project

University TALI funded project _ Phase 2.

- **The research questions for the project:**
 - What educational value can 3D digital technologies add to established 2D CAD programs and traditional methods in Textiles, Surface, Costume, Craft and Fashion Design education ?
 - What innovative Learning and Teaching approaches and experiences are needed to encourage and support effective, engaging and transformative appropriate uses of 3D digital technologies in Textiles and Fashion ?
- **Project Outcomes:**
 - Explored, Evaluated and Integrated a diverse range of 3D technologies and techniques for textiles, surface, craft, costume & fashion design.
 - Researcher & industry practitioner learning experiences
 - Student authored Blog recording reflective learning and methodologies using 3D technologies.
 - Conference Presentations & Journal publication.
 - *Project team includes:*
 - Academics in Textiles & Fashion design, 3D Digital design academics, postgraduate research students and industry partners.

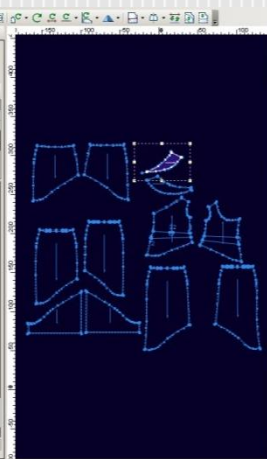
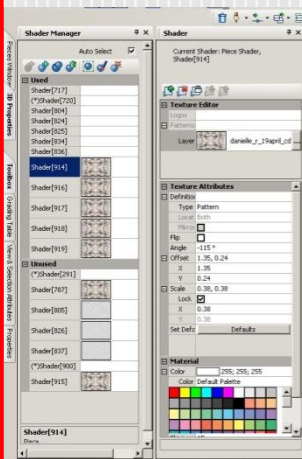
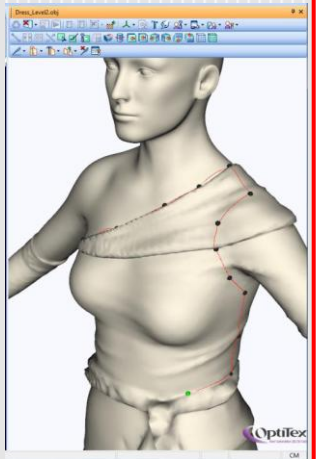
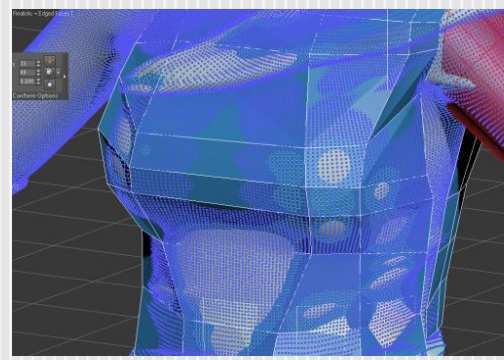
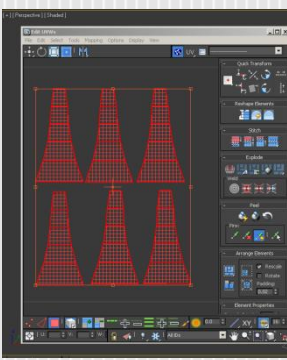
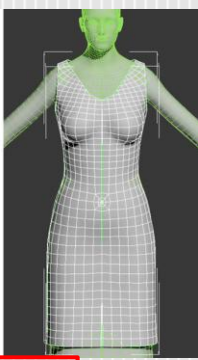
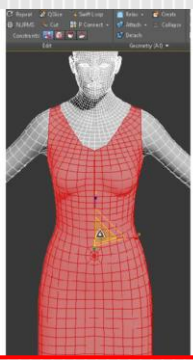
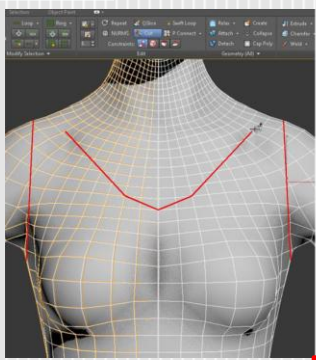


3D Digital Design:



MA Postgraduate Dan HughesMcGrail:
3D digital portrayal of Sir Patrick Stewart as *Elizabethan* Francis Bacon.

3D Digital Design @ Huddersfield. <http://www.huddersfield3d.co.uk/>



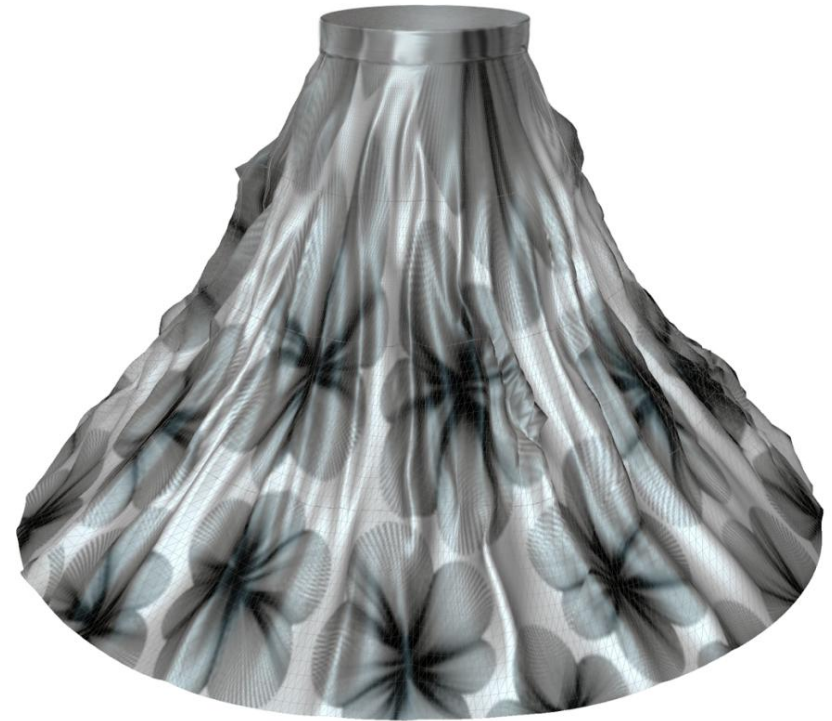
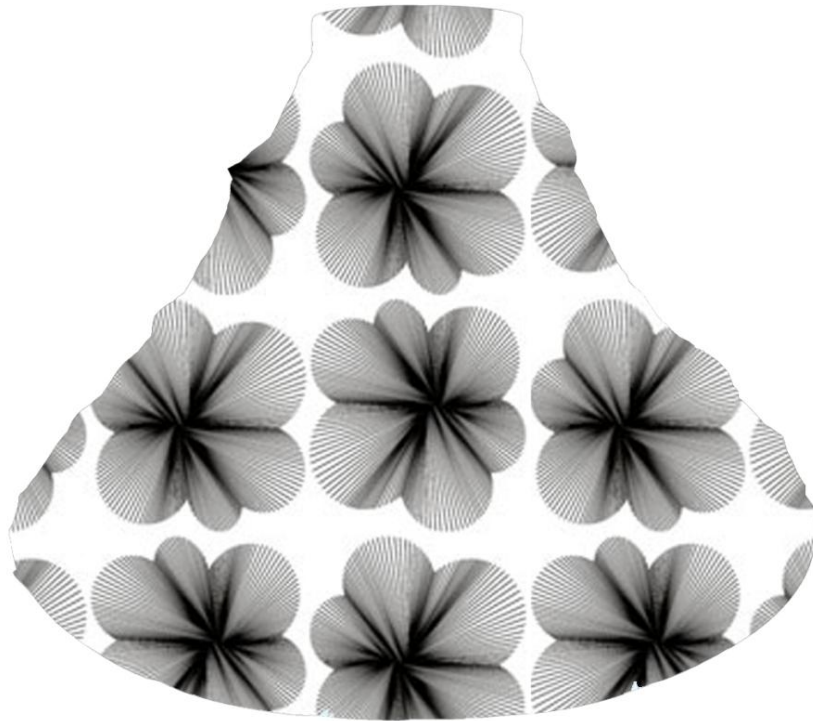


Autodesk Mudbox: Digital Clay Modelling software
3D Sculpture tools design practice experiments



Sculpting voluminous costume elements:


Baz Armstrong - Facebook sculpting video



2D image compositing v Pattern on 3D digital surface

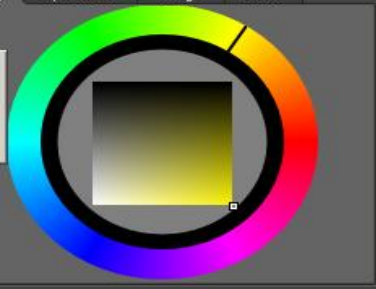
Chooser: Pencil Color

History



Color Wheel

Spectrum Image Blend



Numeric Input

Color Palettes

Done Revert



Layers

Object List

Name

Diffuse

Paint 1

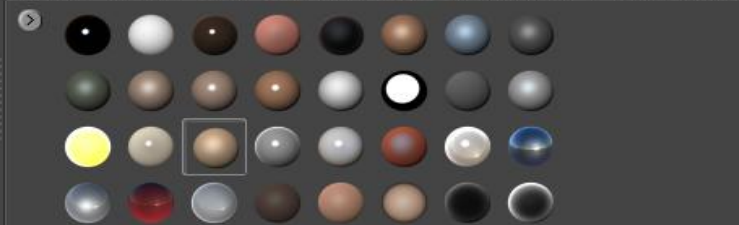


Paint Tools

Paint Brush Projection Eyedropper Airbrush Pencil Paint Erase Clone Dry Brush

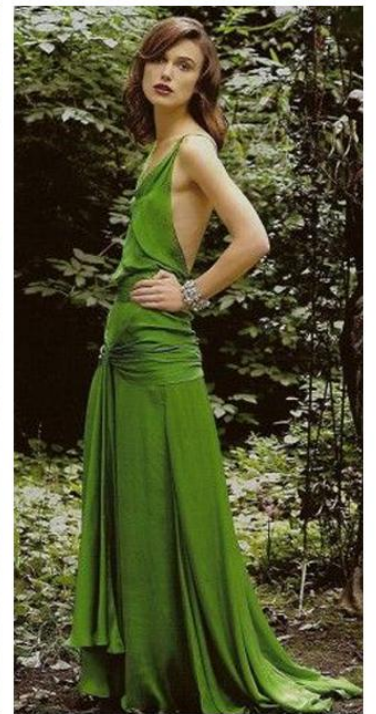
Blur Dodge Burn Contrast Sponge Hue Hue Shift Invert

Material Presets

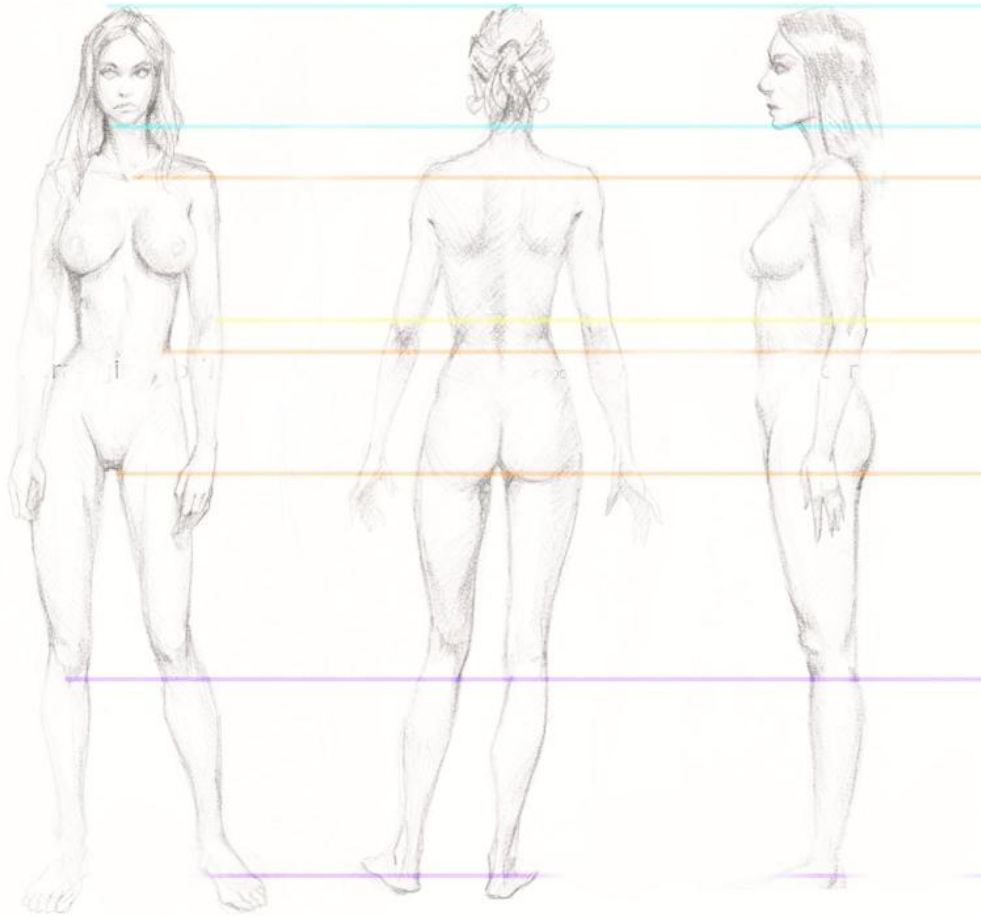


Costume 3D sculpture workshop: year 2

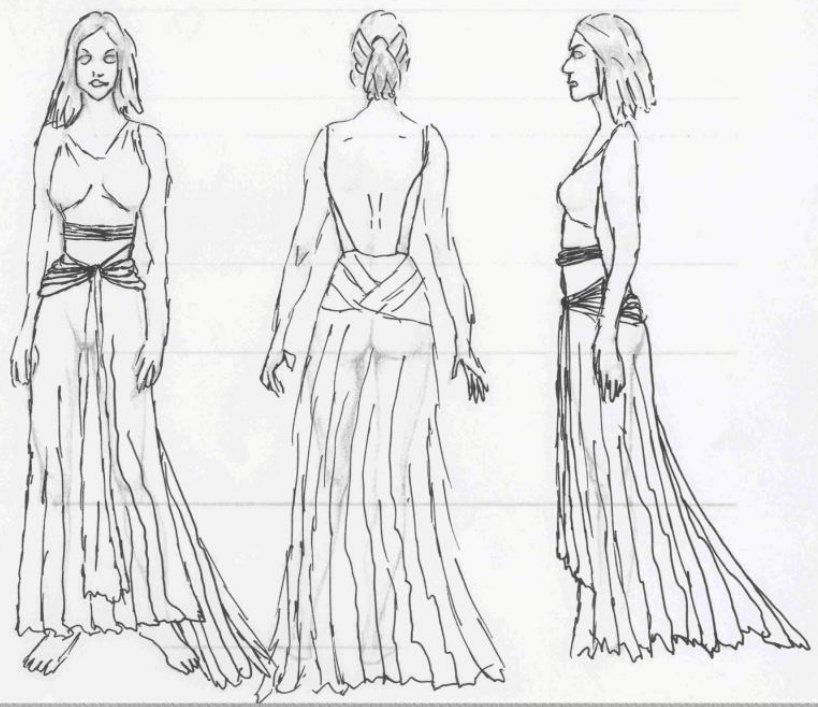




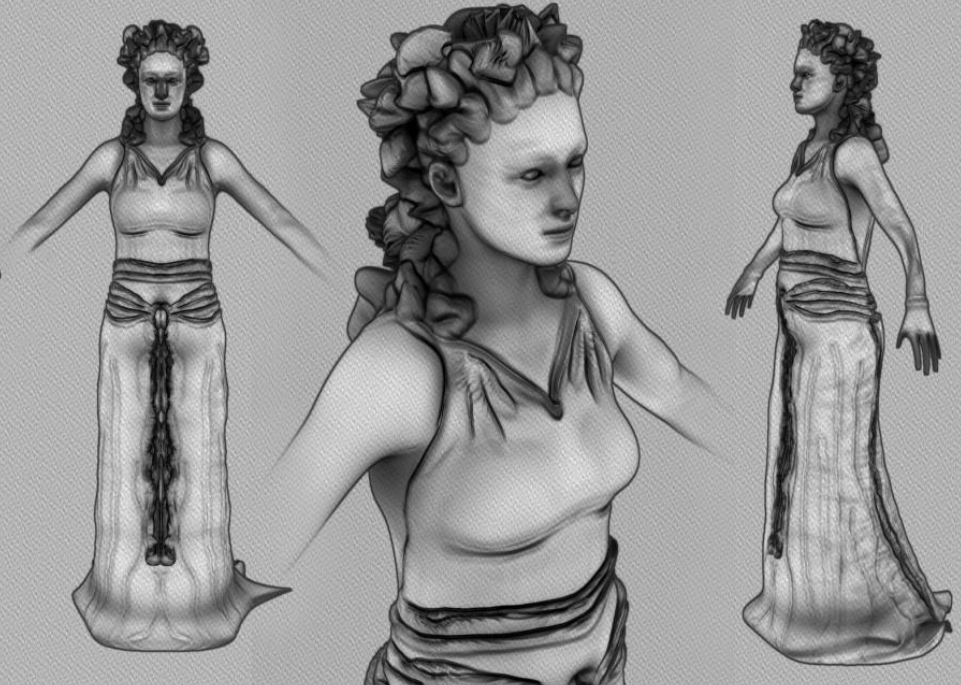
Jacqueline Durrans 'Atonement' Dress selected as a control design in experiments



2D & 3D sketch templates for costume sculpture workshop

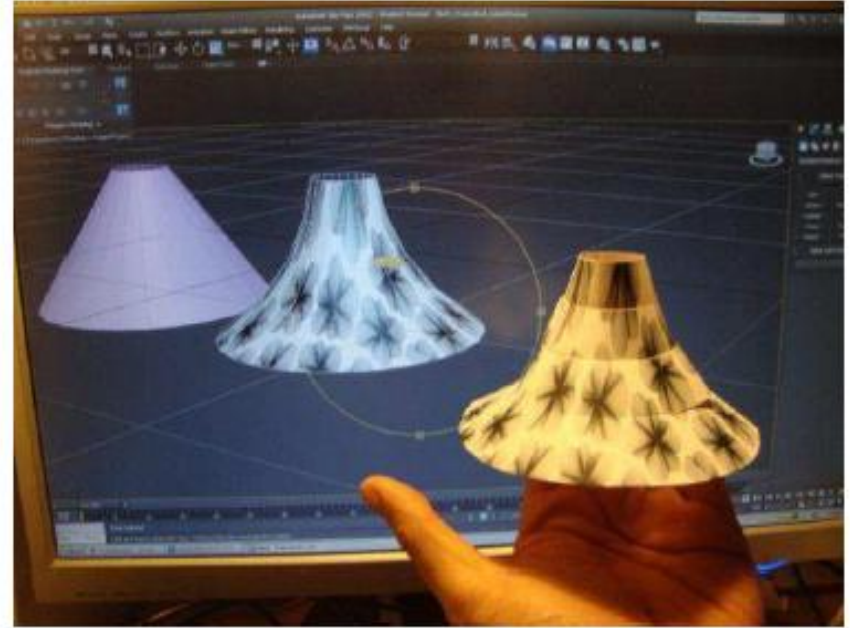
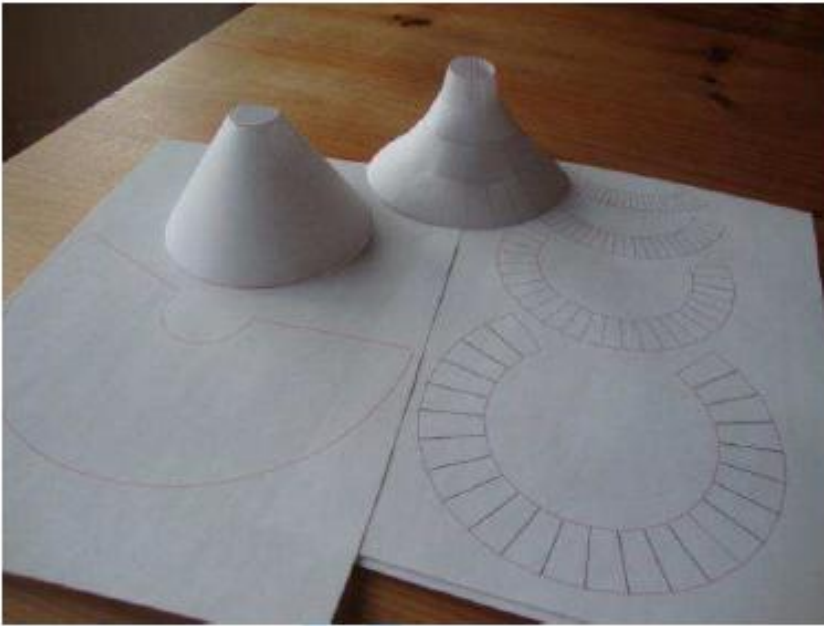


Designer #7

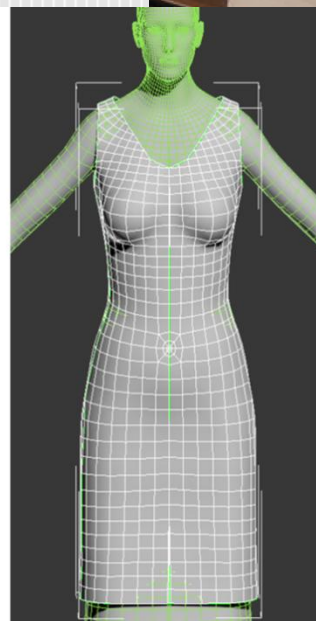
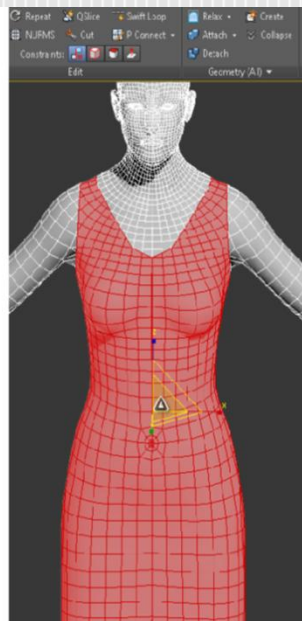
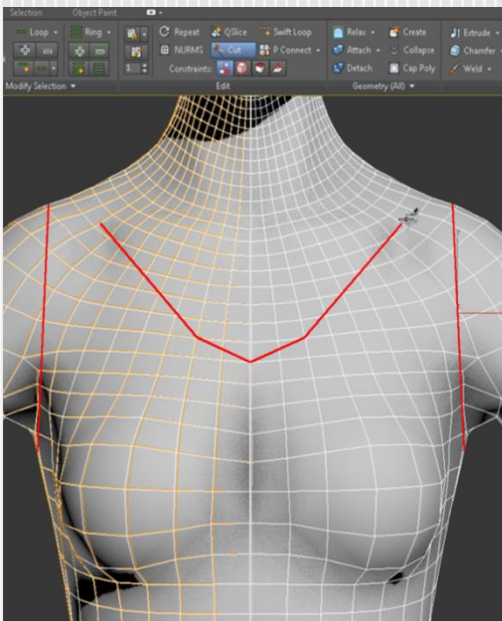
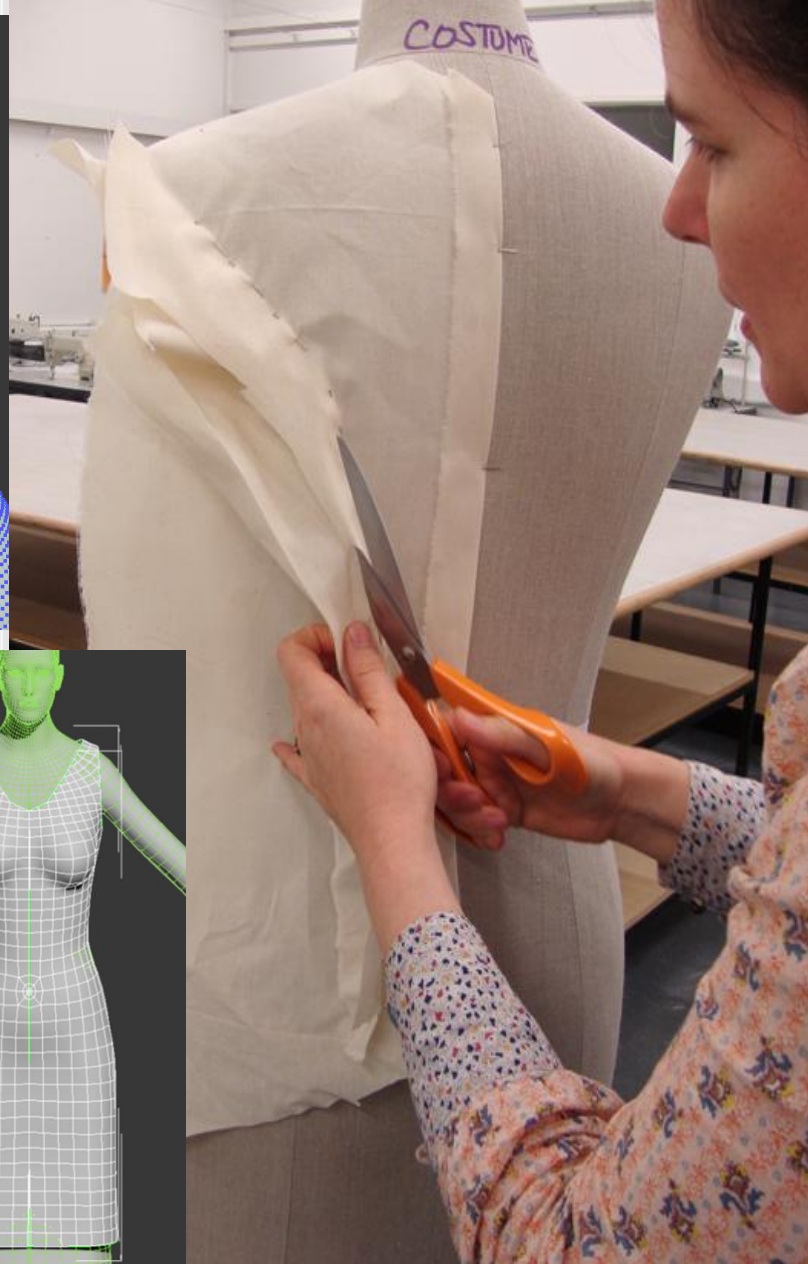
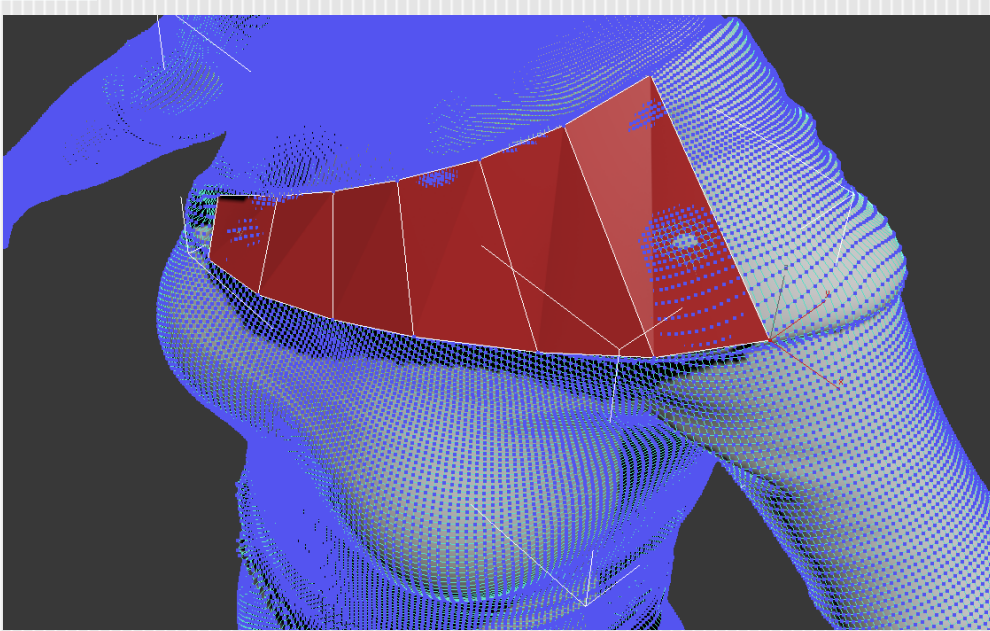


**Presentation of pattern development at the
School of Art, Design & Architecture
Postgraduate research symposium**

Baz Armstrong



**Asked if video game production tools could be used
to create
makeable patterns ?**

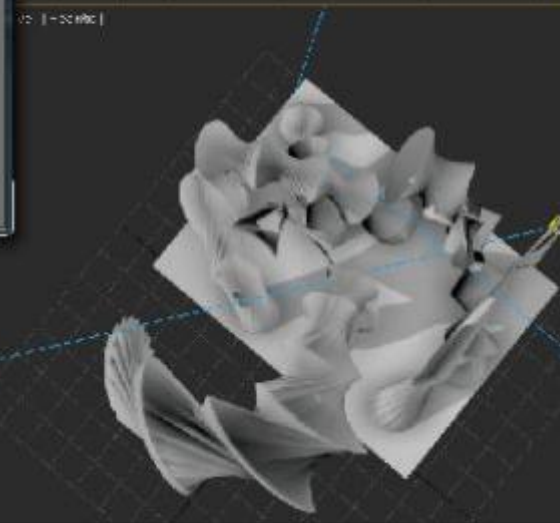
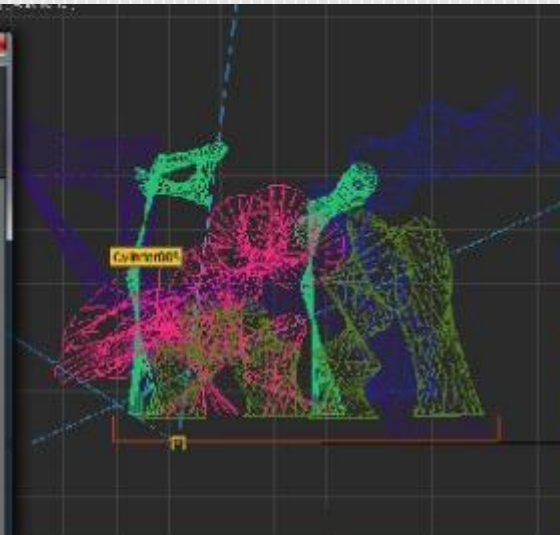
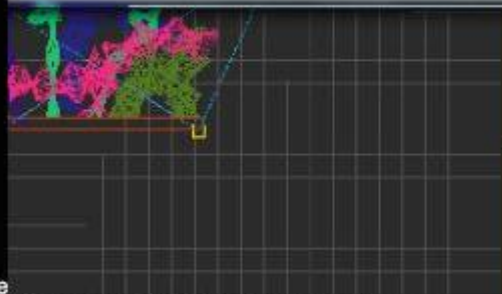
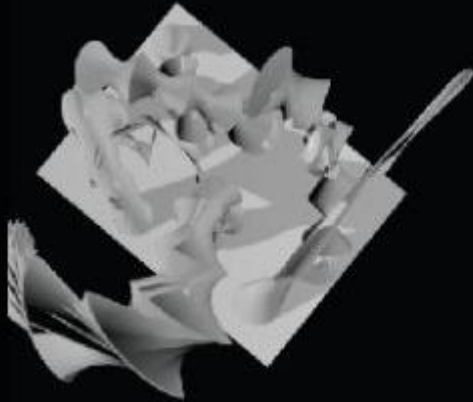


Relationship between games design production & costume designer modelling working on the stand

**Liz Garland
Costume technician**

THE PROC

- FINISHED FABRICS
- DIGITAL PRINTING
- TESTING
- PHOTOSHOP
- MUDBOX
- 3DS MAX
- POLYMORPH
- HAND MODELING



DANIELLE RILEY - Surface De
Contact No: 07508047816. Email: danielleriley.design@gmail.com

EXPERIMENTING WITH PLASTIC, PLASTER OF PARIS & WIRE.
MODELLING WITH CLAY BY HAND. STARTING TO USE MUDBOX TO DEVELOP DIGITAL CLAYSHAPES.

THE PROCESS

FINISHED FABRICS

DIGITAL PRINTING

TESTING

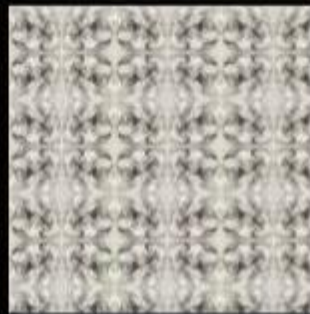
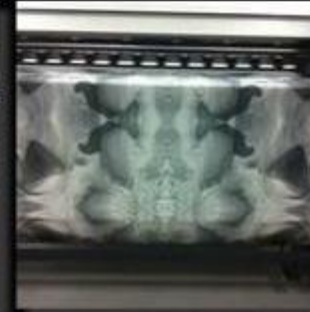
PHOTOSHOP

MUDBOX

3DS MAX

POLYMORPH

HAND MODELING



◀ 1/2 ▶

DANIELLE RILEY - Surface Designer / Trend predictor for fashion & interiors.
Contact No: 07508047816. Email: danielleriley.design@gmail.com



APPLYING SURFACE TEXTURES. 11. TAKING THE 3D OBJECTS AND TRANSFORMING THEM INTO REPEAT PATTERNS. 12. SAMPLING WITH SCALE AND PATTERN. 13. COLOUR TESTING TO ENSURE THE COLOUR BRINGS OUT THE DEPTH. 14. PRINTING LARGE SCALE. 15. FINAL PRINTS PHOTOGRAPHED TOGETHER. 16. USING THE LASER CUT TER TO ADD MORE DEPTH FROM THE 3D 2D PRINTED FABRIC.

Can a 3D costume sketch be pattern cut? And visualised as a virtual & a physical sample?



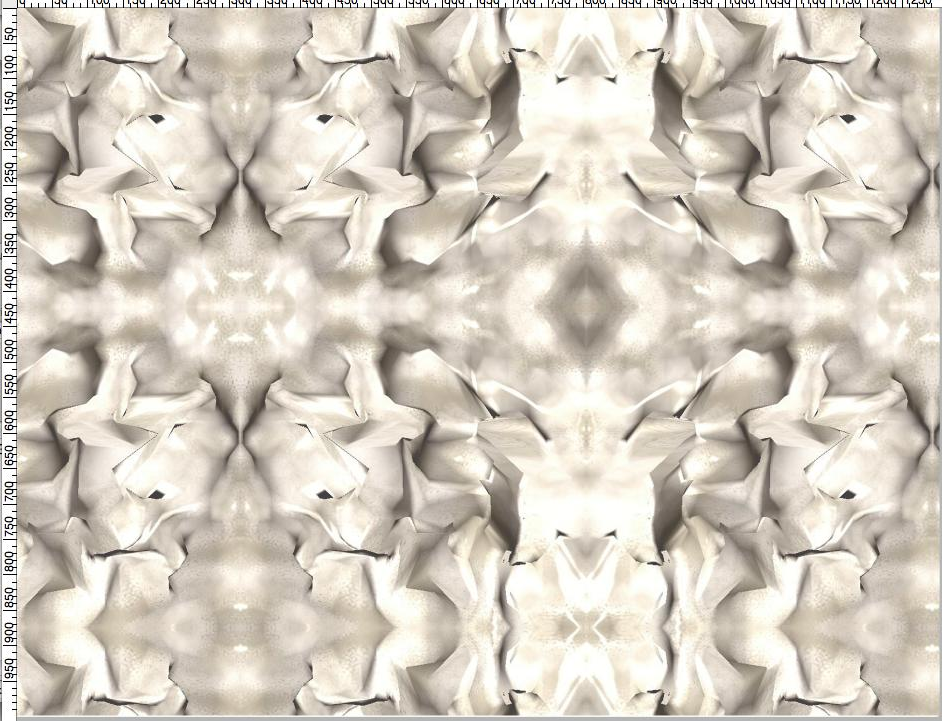


Autodesk Mudbox Digital 3D Sculpture translated into a digital print repeat on silk twill using AVA print design software.

Danielle Riley BA (Hons) Surface Design graduate 2011.

Mimaki Tx2 - mimaki
Printing 'danielle_2may1'
Approx 11:32 to go
Printer Active

danielle_2may1_st.avaqc
Views New Embed File Tool Basic Editing Fonts Front Back Inspector Palette Size Scale 25% View Scale
0 150 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650 1700 1750 1800 1850 1900 1950 11000 11050 11100 11150 11200 11250



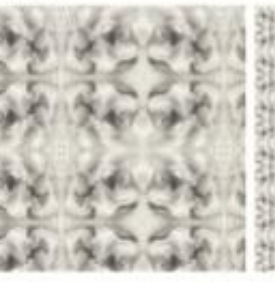
TX2 chiffon mo
Print Delete Start Queue
Job Name W cm
TX2 Sil
Print Delete Stop Queue
Job Name
danielle_2may1_st 1
Ink Setting: HU Silk v6 Ink

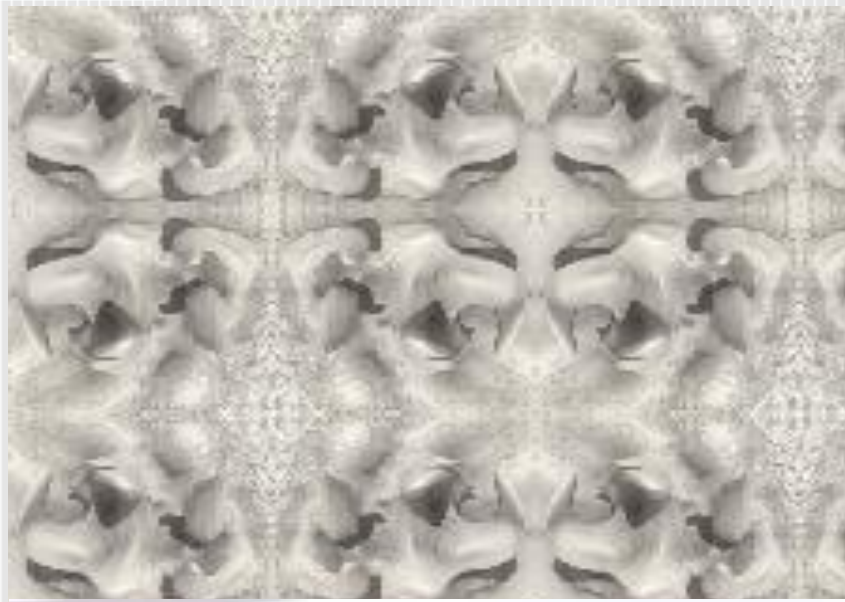
Repeats
Across: 1 Down: 2 Frame First Repeat
Drop: Across 0 mm
Mirrors:

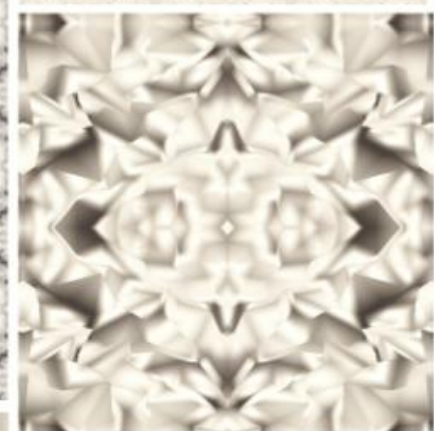
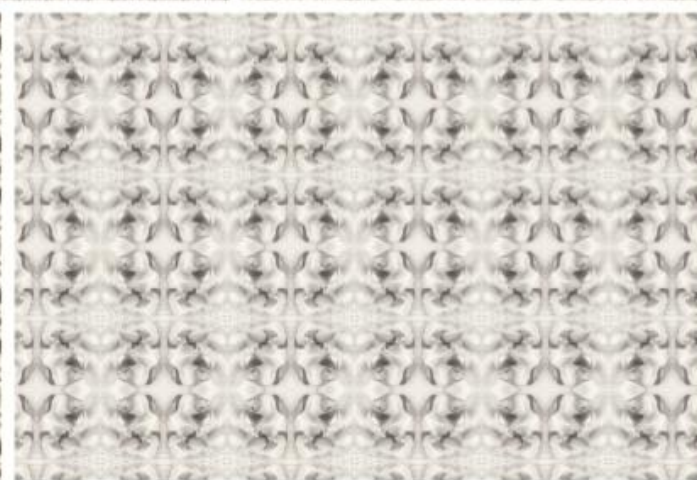
IF YOU HAVE ANY TE
THIS COMPUTER OR
PLEASE CONTACT C
HEL



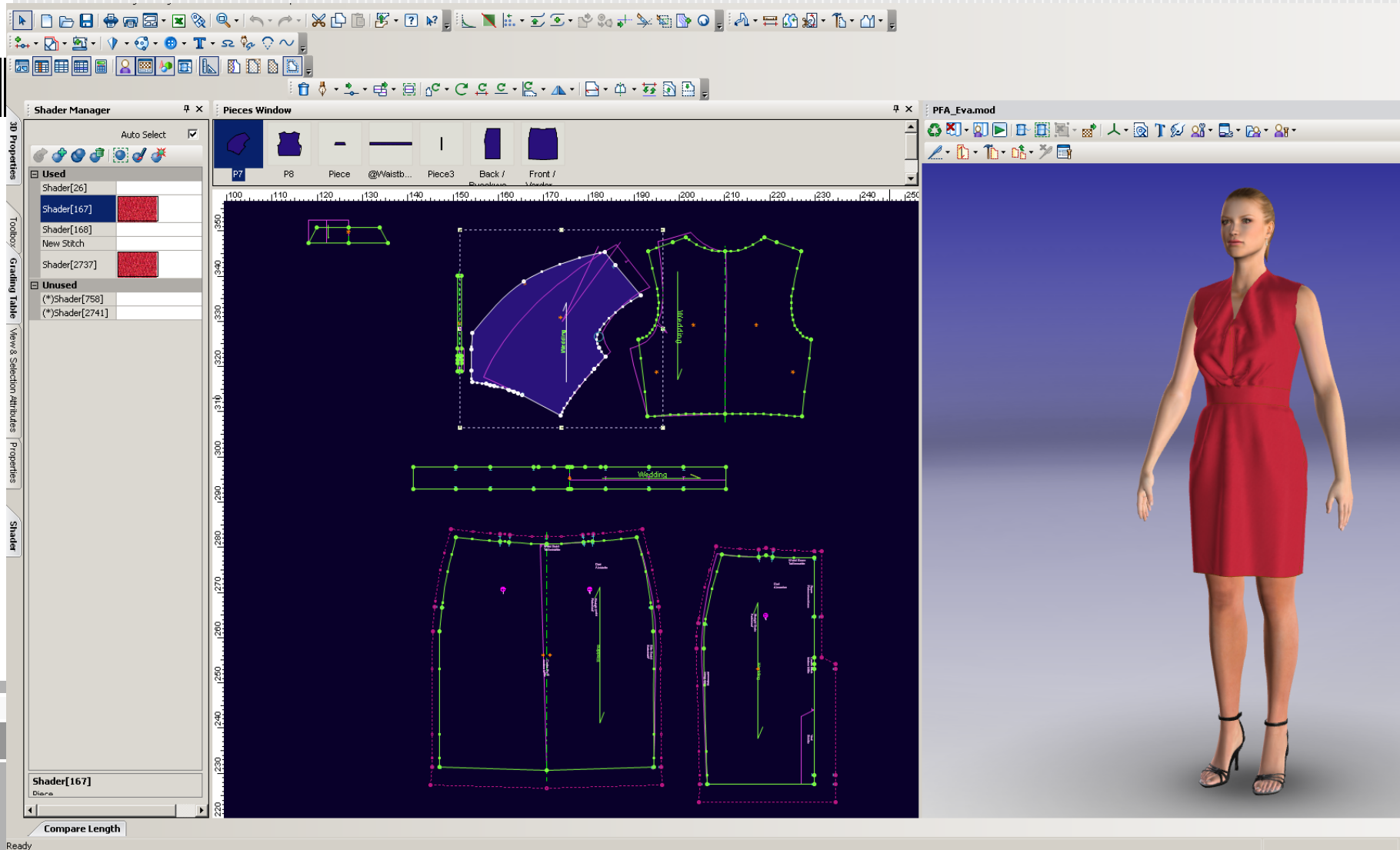
PLEASE ALWAYS DRIVING AND EATING NEAR THE COMPILERS AS SPILLAGES CAUSE
ESE MACHINES ARE REIN
OS X
mimaki_printed_screengrabs
final8.tif
Page Setup...
00125013001350140014501500155016001650



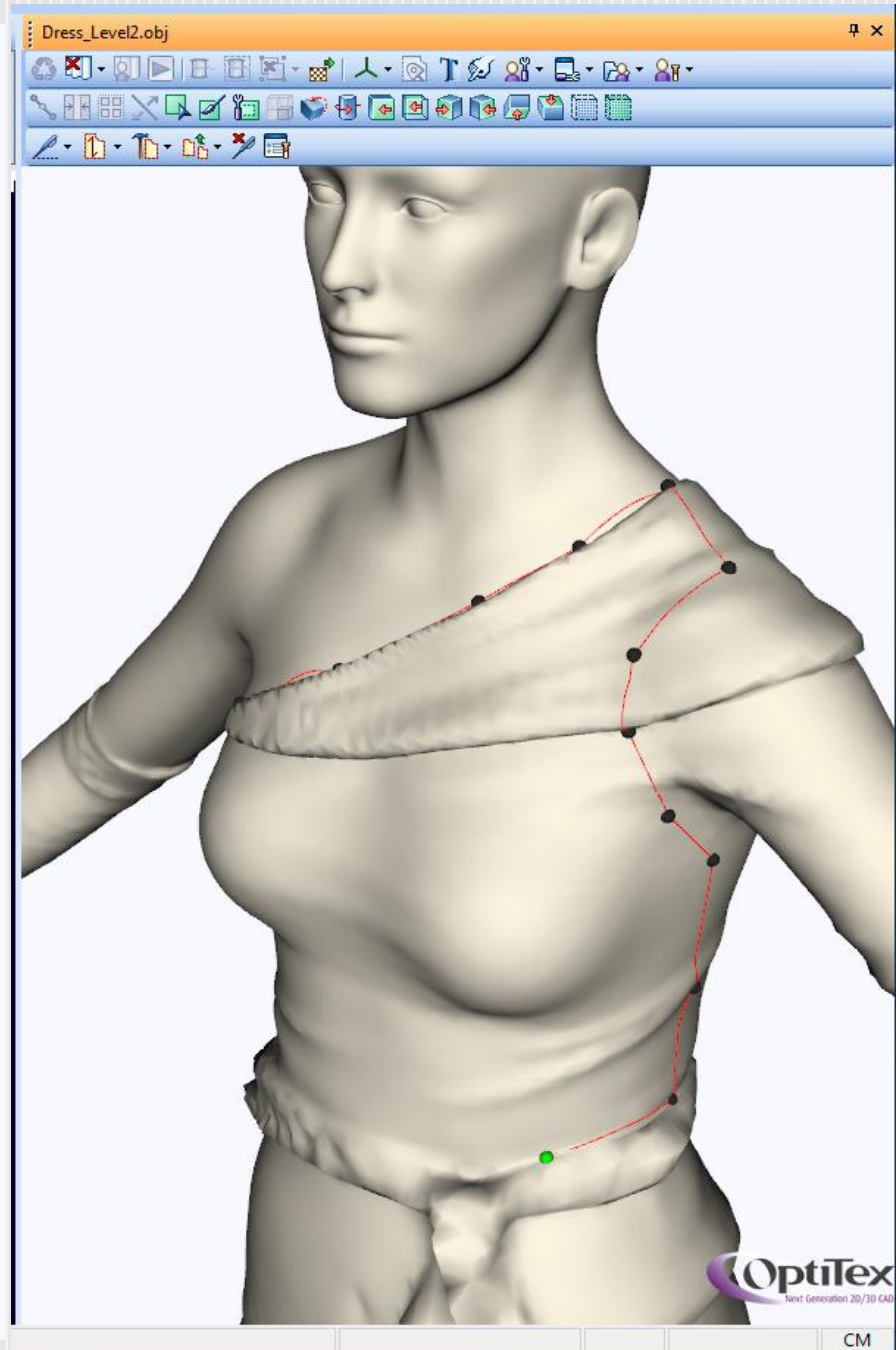
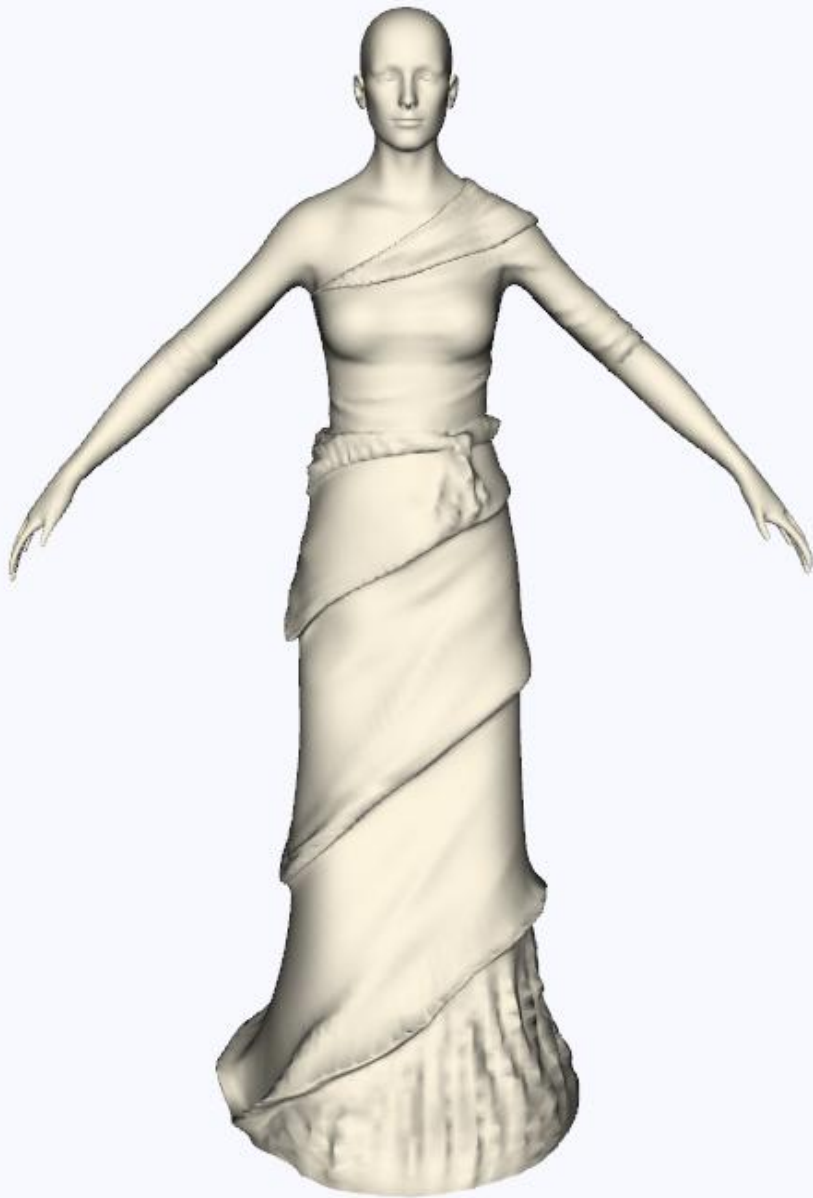




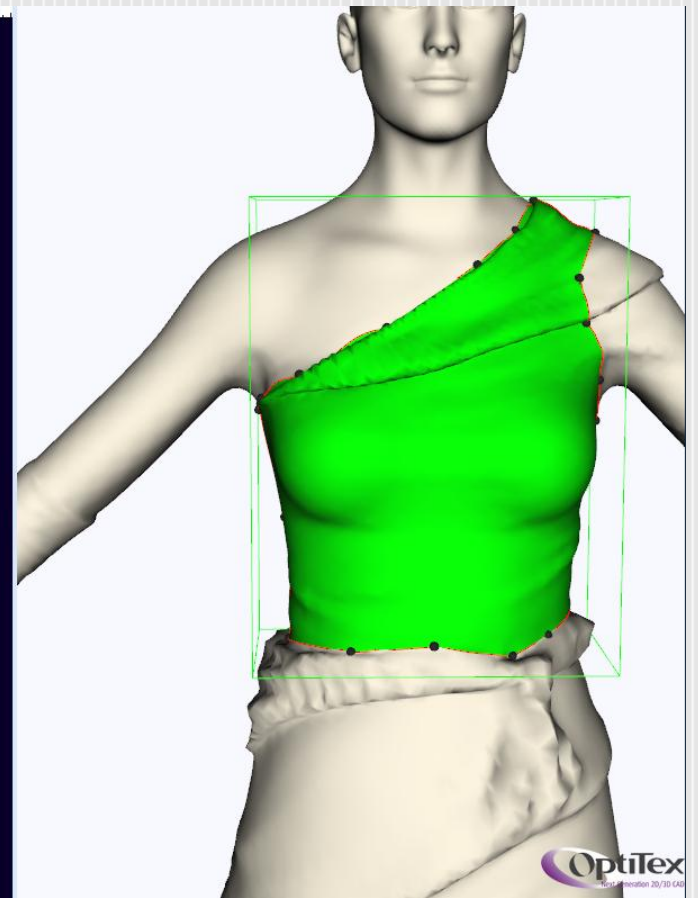
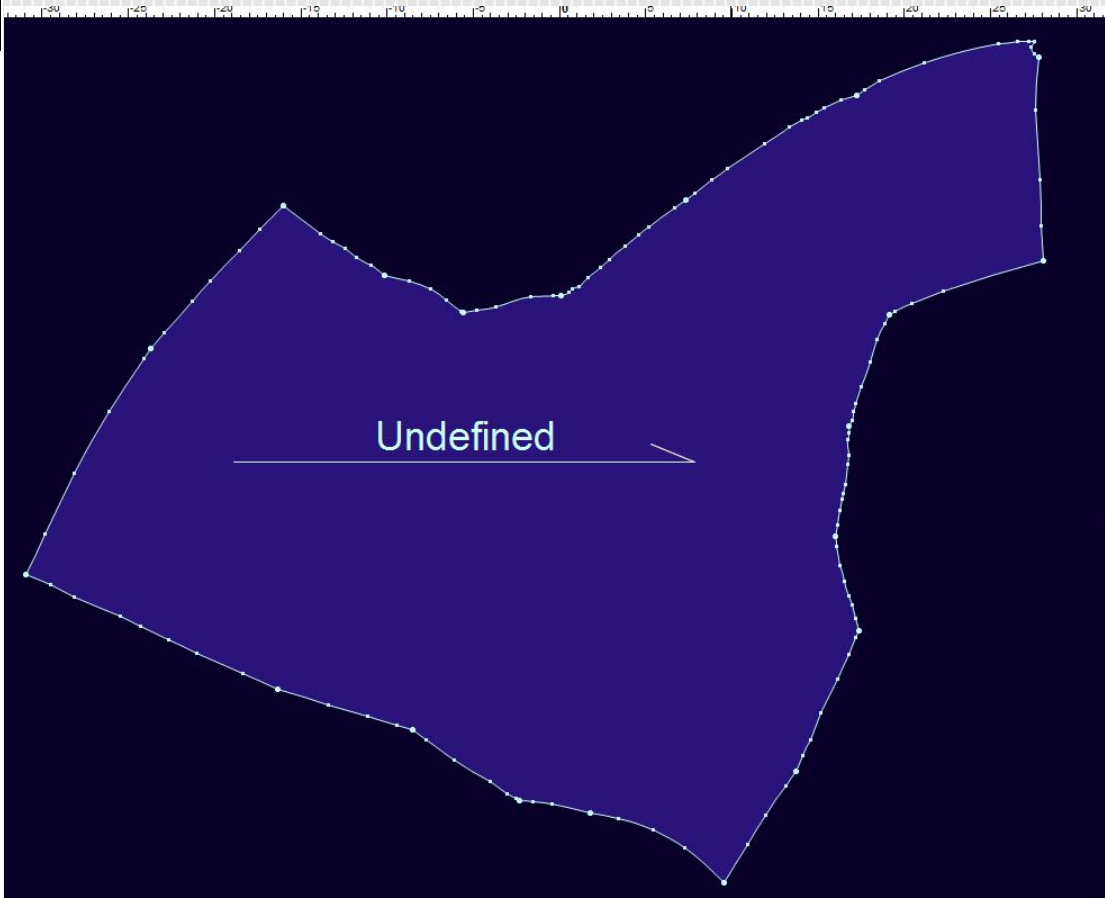


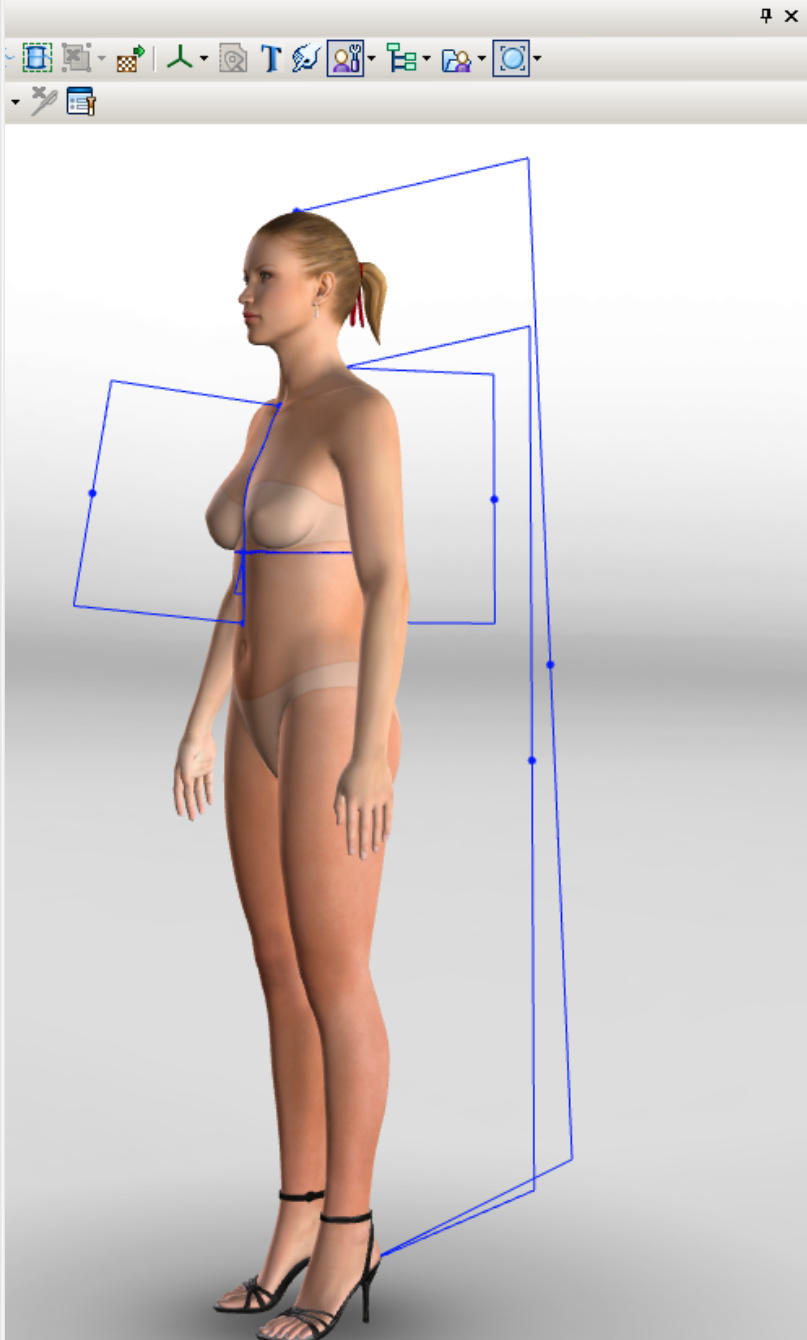


ASSYST BULLMER & OPTITEX - GEOFF WARD: 3D pattern design, print visualisation and garment construction



Mudbox 3D illustration - imported into Optitex - drafting bodice pattern





Model Properties

Morphs	Size[underbu	76.26
↳ Basics	Size[unde	
Length	Height	167.72
Circuml	Cervical Heig	143.87
Bust	Body Depth	18.85
Pose	Body Dep	
Face	Body Width	26.56
↳ Props	Weight Bal	
FootWi	Posture	
Socks	Muscles	
Hair	Arms Mass	
Should	Trapezius	
Enviror	Seat Promine	
Access	Upper Boby I	
Misc		
	Belly[Pregna	17.73
	Belly Shape	
	FrontRise Vo	
	Buttocks Bun	
	Buttocks Hei	
	Buttocks Typ	
	Widest Hips	
	Widest Hips I	
	Mid Hips	
	Crotch Shap	
	Front Thigh c	
	Back Thigh C	
	Back Waist L	41.22
	Front Waist I	34.8

Parametric Female: Eva (Bust Edition)
Version: 01082011

Display

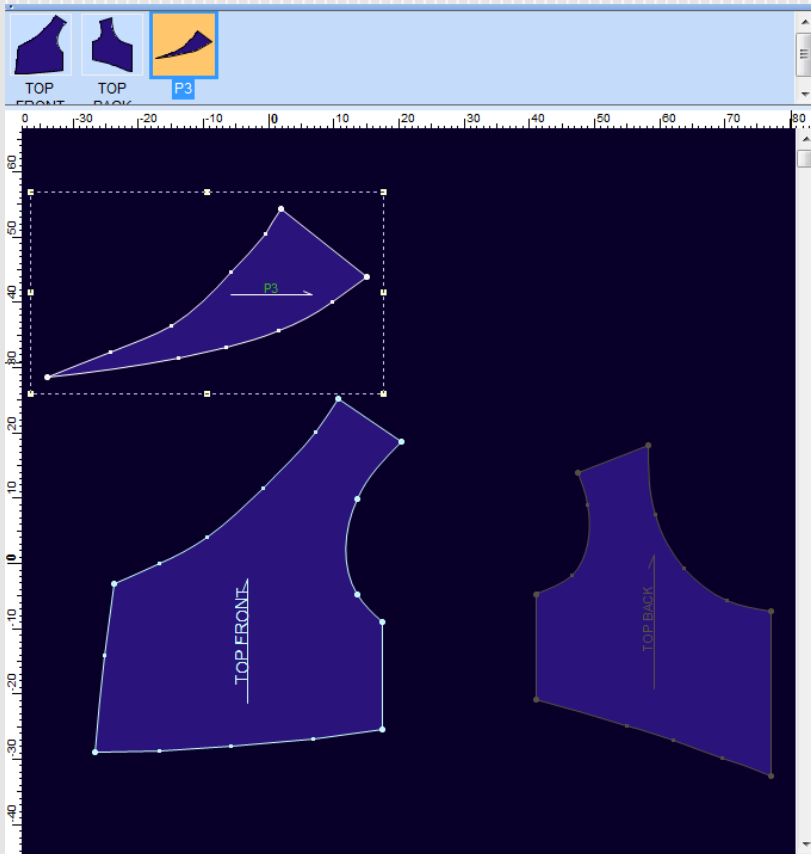
Full display

All display

Clear Display

Place measure Restore Restore All

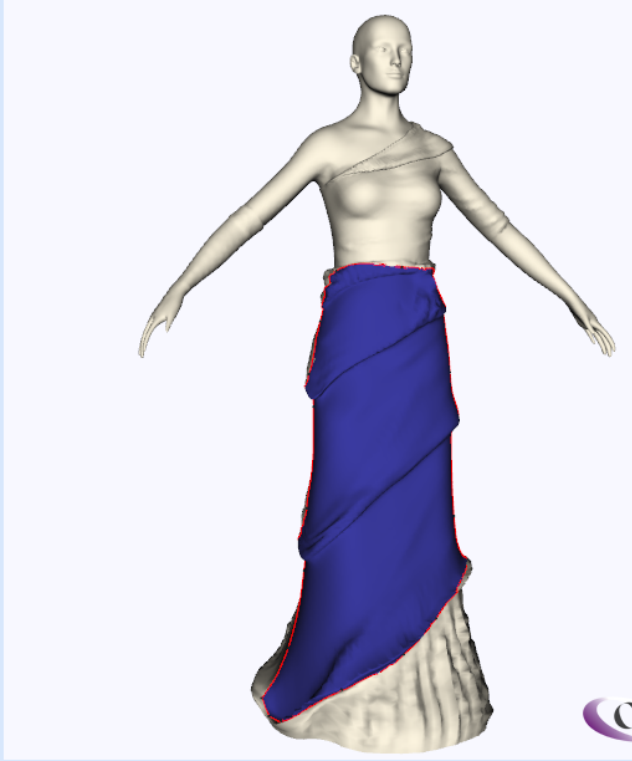
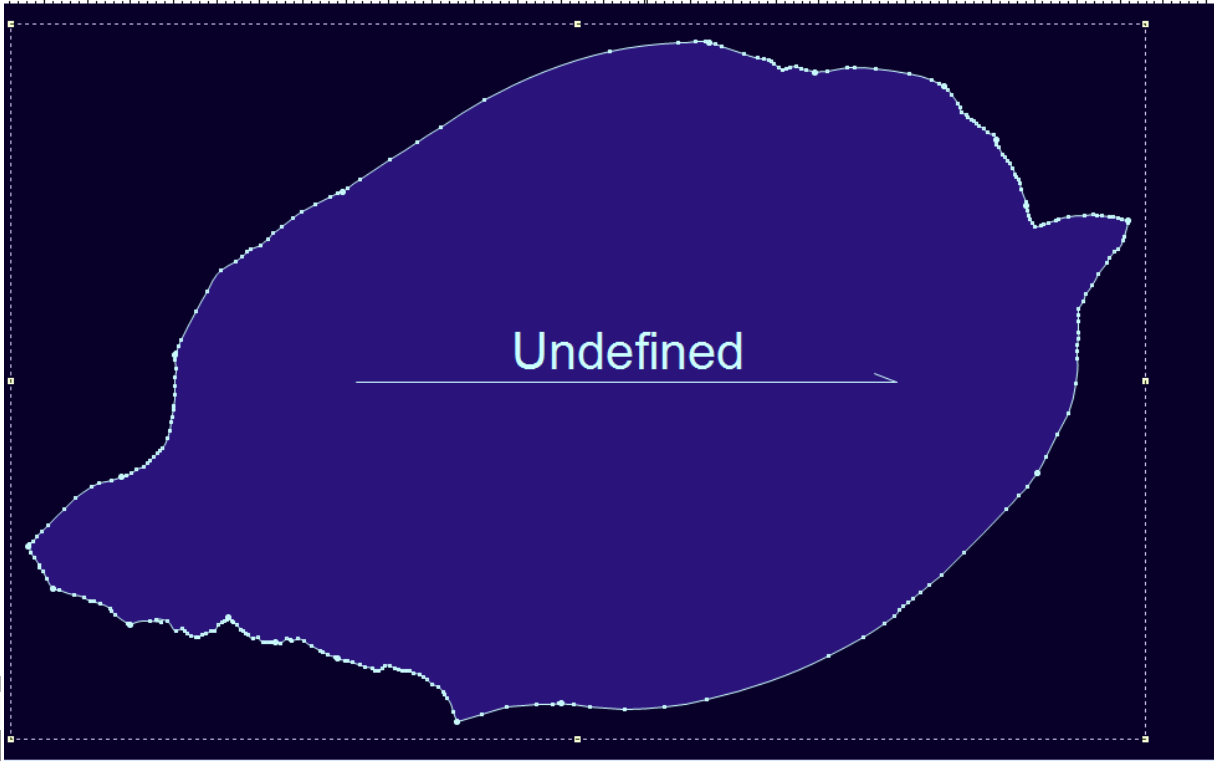
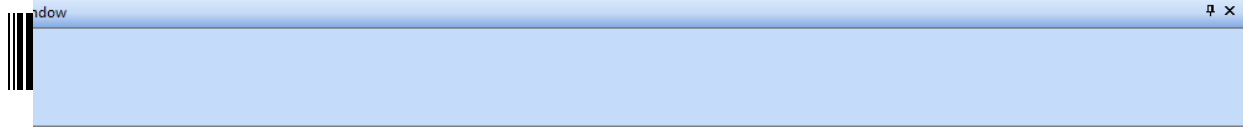


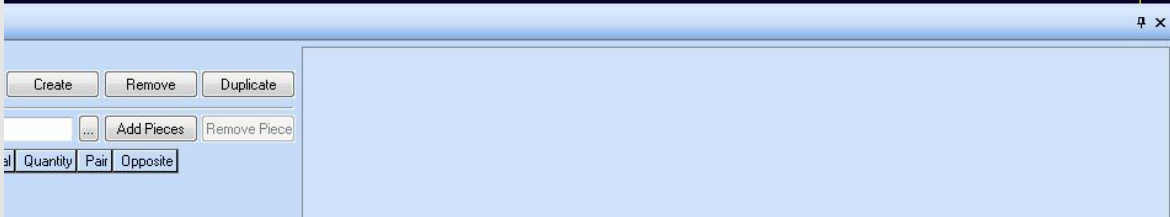
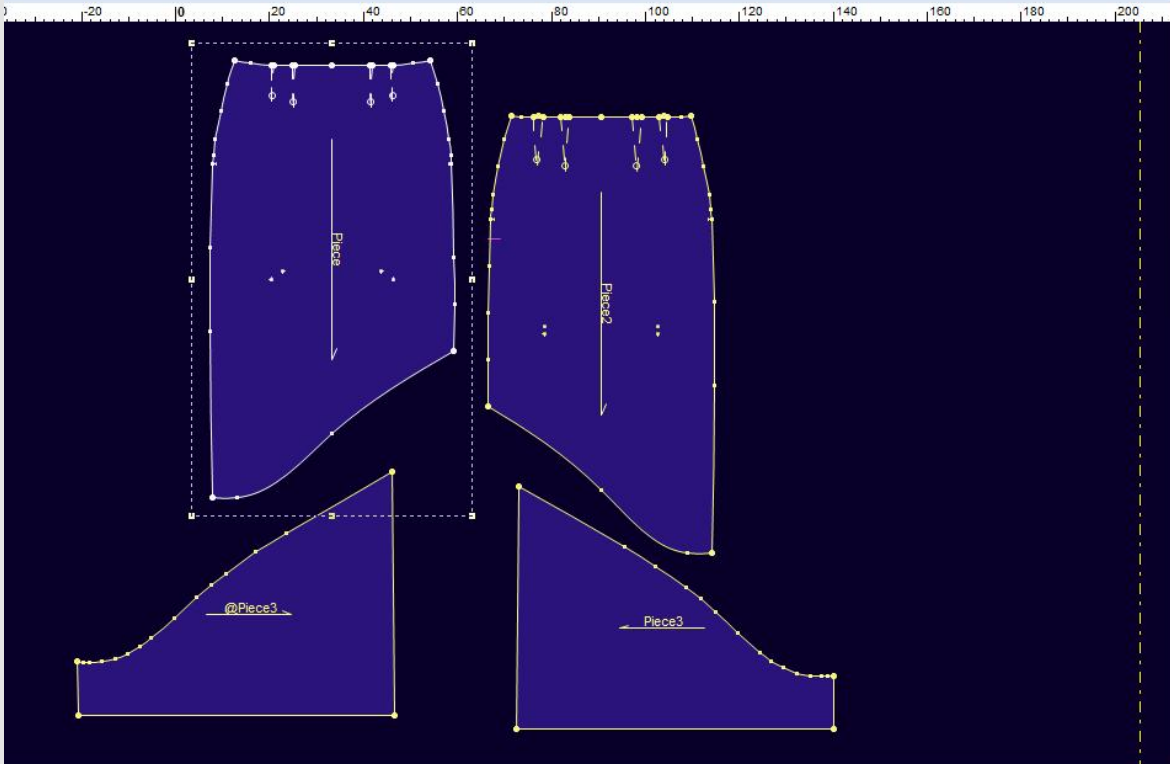
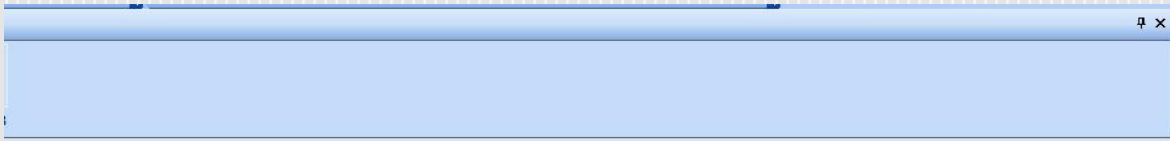


Piece: P3

- Global**
 - Size: base *
- Display and Lock**
 - Ignore:
- Positioning**
 - 2D to 3D Orientation: Synchronize
 - Location: Front
 - Shape: Flat
 - Layer: 2
 - Symmetry: Aligned
 - Resolution: 1 cm
 - Group Name:
- Fabric Parameters**
 - Fabric List: C:\Program Files (x86
 - Select Fabric: Unknown Fabric Typ
 - Bending: 500; 500 dyn*cm
 - Stretch: 1000; 500 gram-force
 - Shear: 300 dyn/cm
 - Friction: 0.01
 - Thickness: 2 cm
 - Weight: 180 gr/m²
 - Shrinkage: 0; 0 %
 - Pressure: 0 psi
 - Set Defaults: Defaults



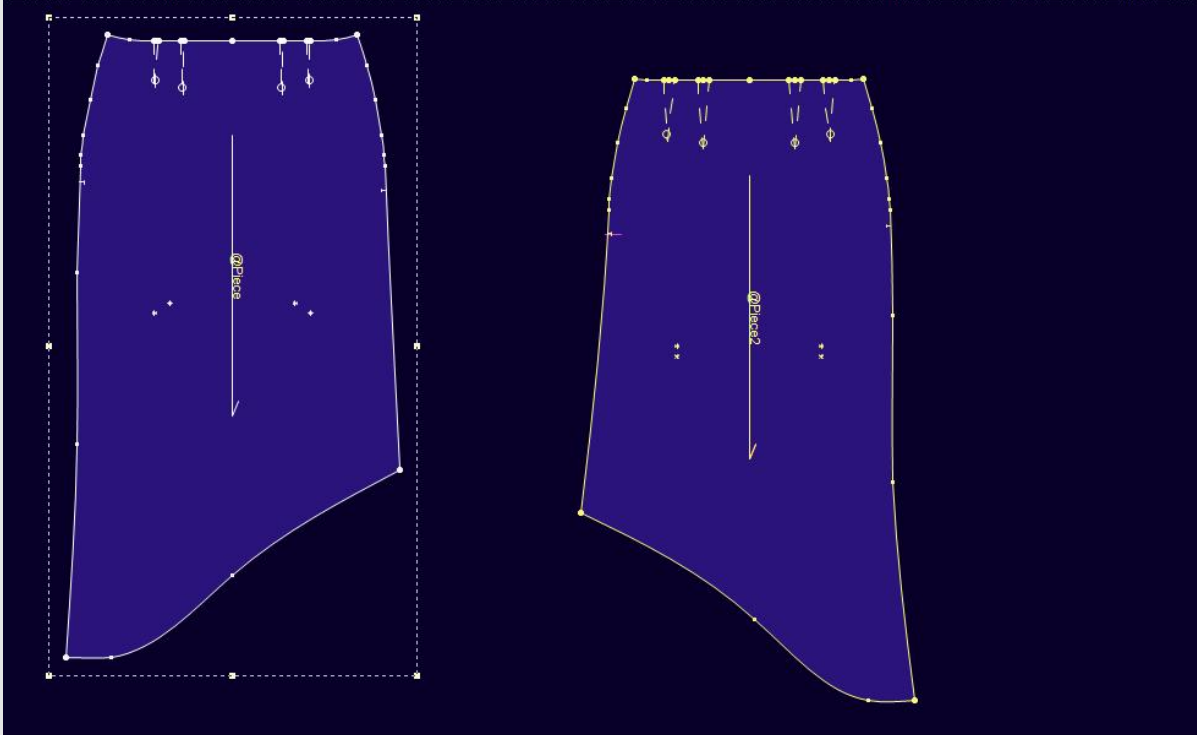




Under Skirt.mod



-20 10 20 40 60 80 100 120 140 160



▼ Create Remove Duplicate

... Add Pieces Remove Piece

Material Quantity Pair Opposite

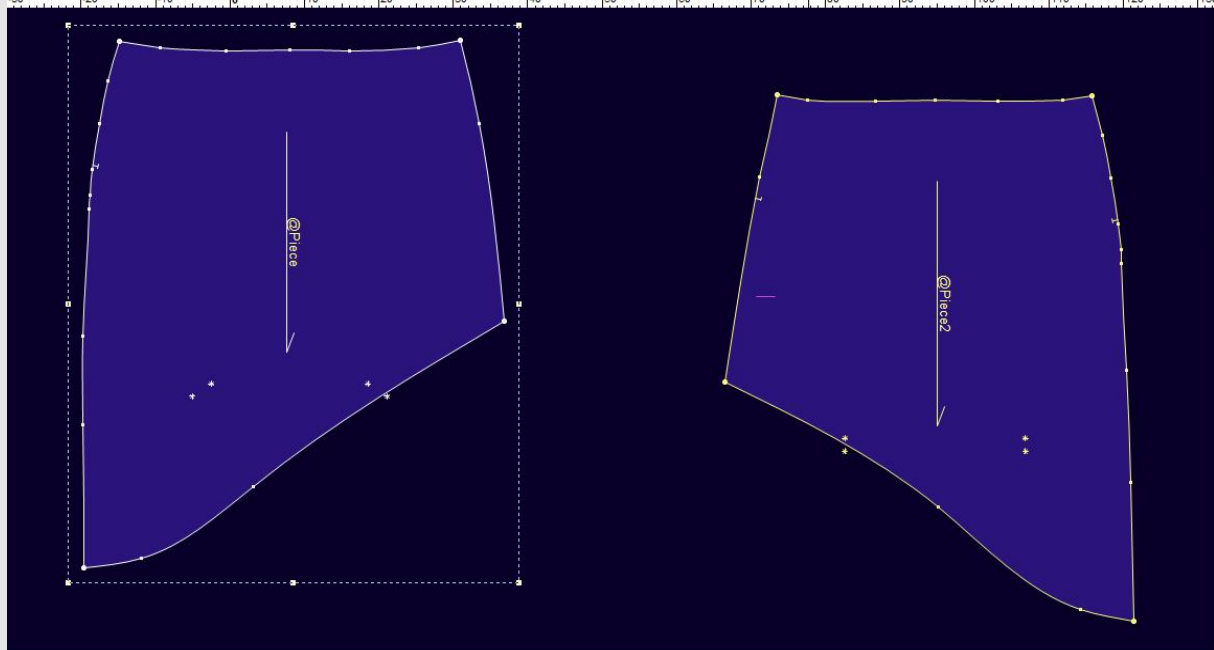


pieces Window

istb... @Piece @Piece2

-30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 130

Second layer green Skirt.mod



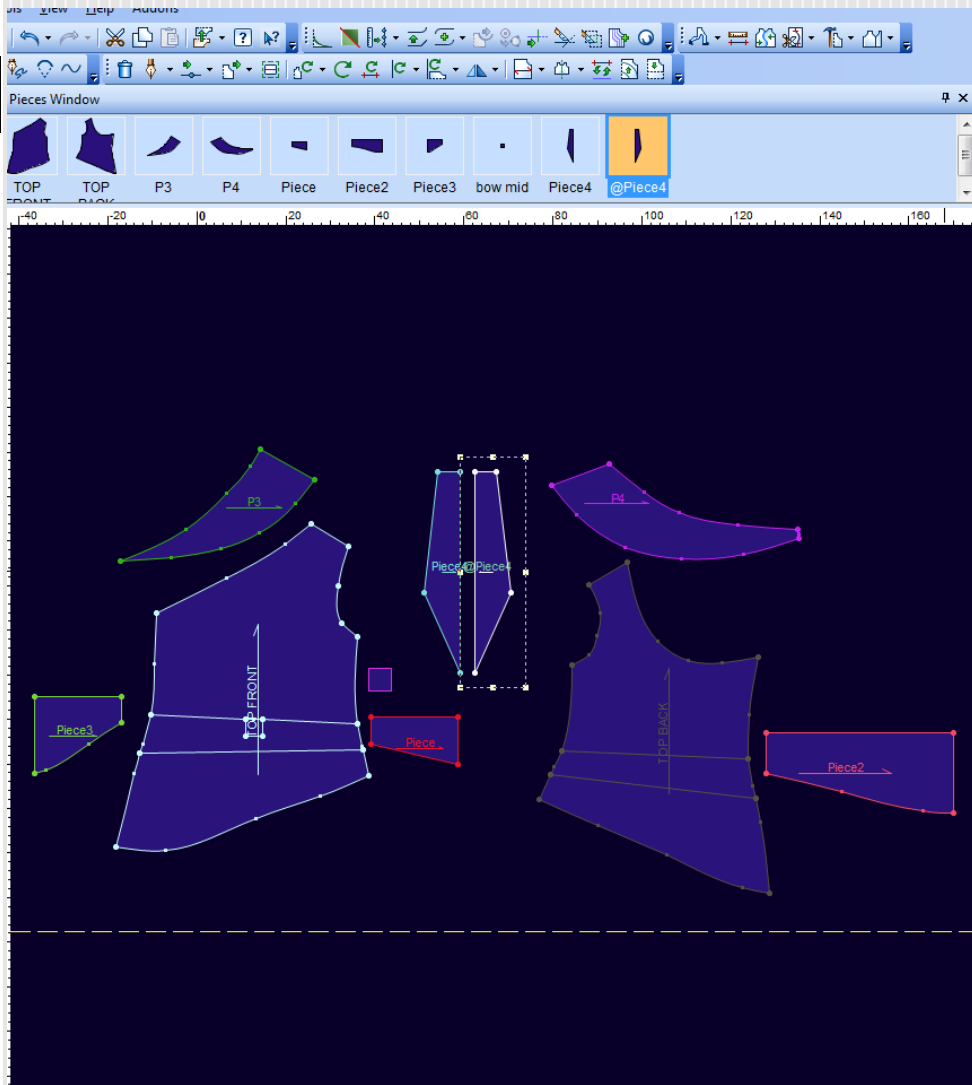
Piece Sets

Piece Sets Menu

sets: skirt wb

description:

Piece Name	Code	Description	Material	Quantity	Pair	Opposite



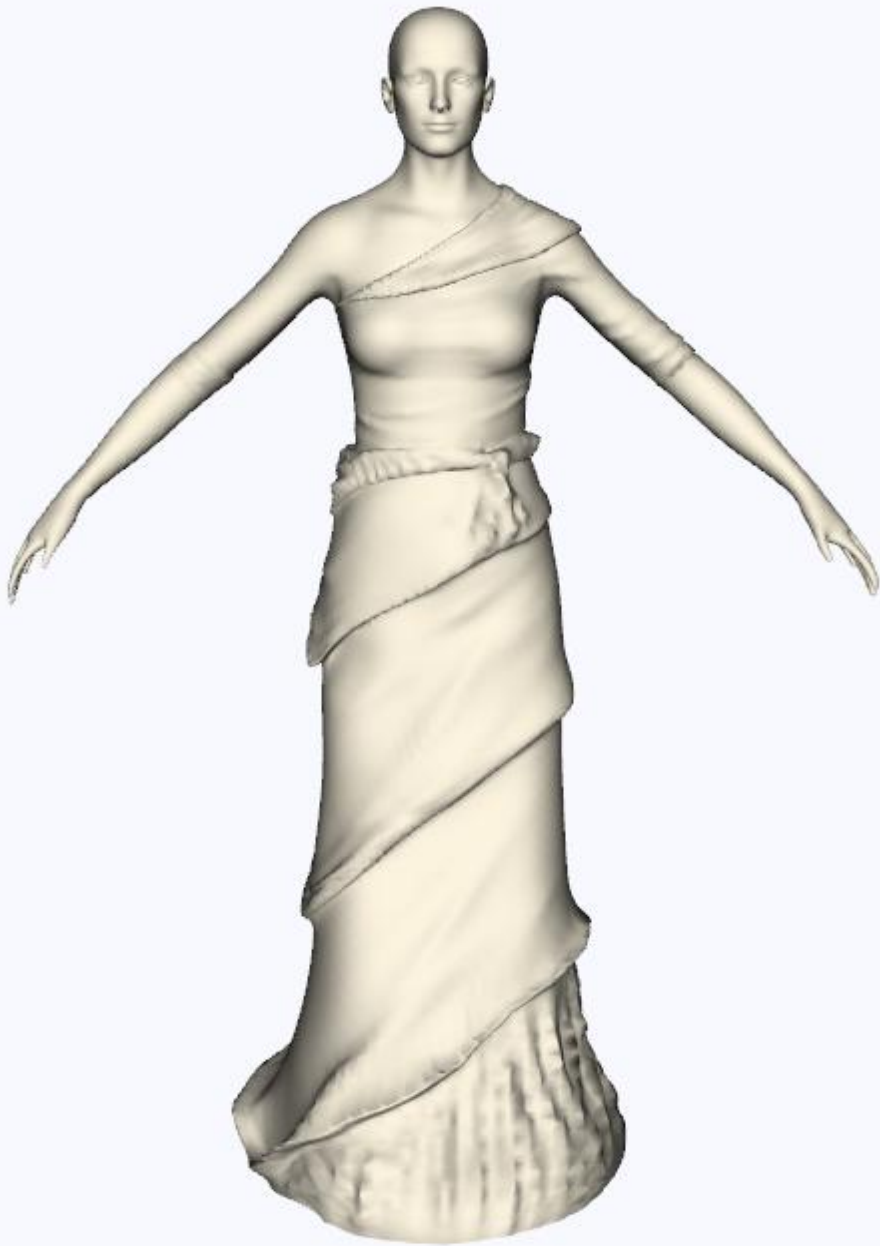
3D Properties

Piece: @Piece4

- Global**
 - Size: base *
- Display and Lock**
 - Ignore:
- Positioning**
 - 2D to 3D Orientation: Synchronize
- Location**
 - Location: Front
 - Shape: Flat
 - Layer: 7
 - Symmetry: Aligned
 - Resolution: 1 cm
 - Group Name:
- Fabric Parameters**
 - Fabric List: C:\Program Fi
 - Select Fabric: Unknown Fabi
 - Bending: 500; 500 dyn*c
 - Stretch: 250; 250 gram
 - Shear: 300 dyn/cm
 - Friction: 0.01
 - Thickness: 0.1 cm
 - Weight: 180 gr/m^2
 - Shrinkage: 0; 0 %
 - Pressure: 0 psi

Set Defaults Defaults





3D Mudbox sculpture

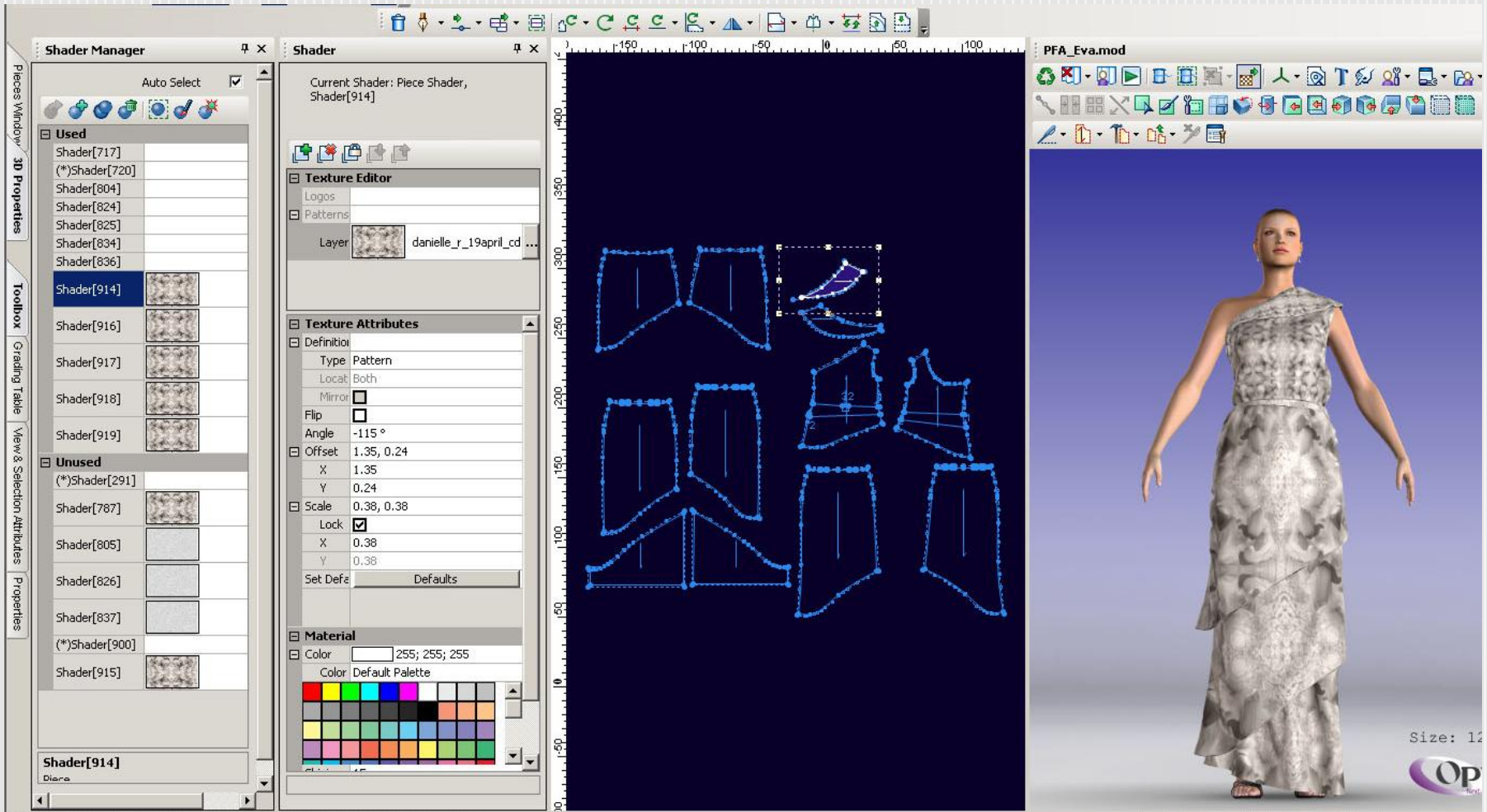


Optitex 3D virtual sample

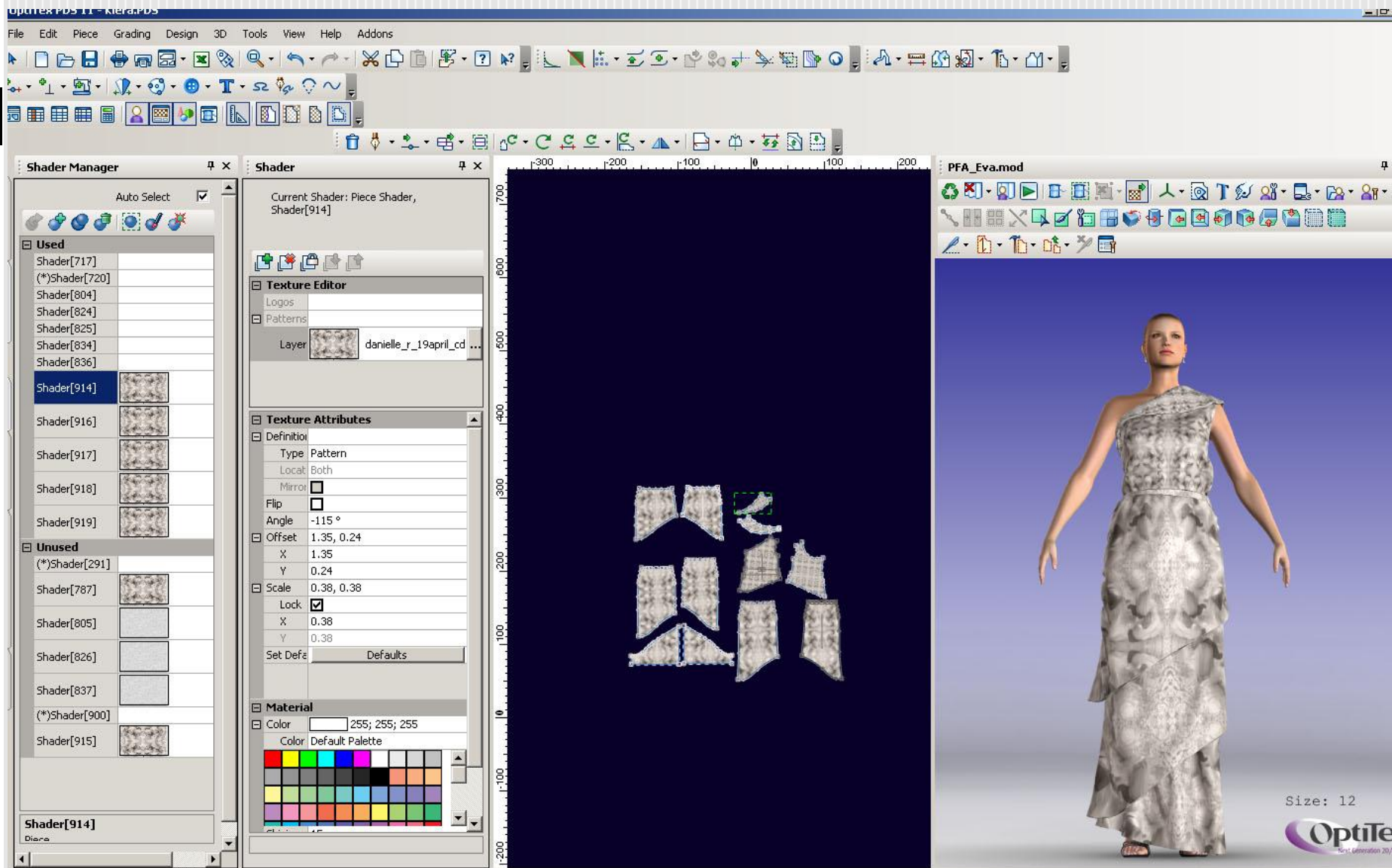


Surface design student 3D Tegular Sculpture converted into a 2D/3D digital print repeat on silk using AVA print design software.

Imported into Optitex pattern design software for accurate print placement on patterns & visualisation on 3D model



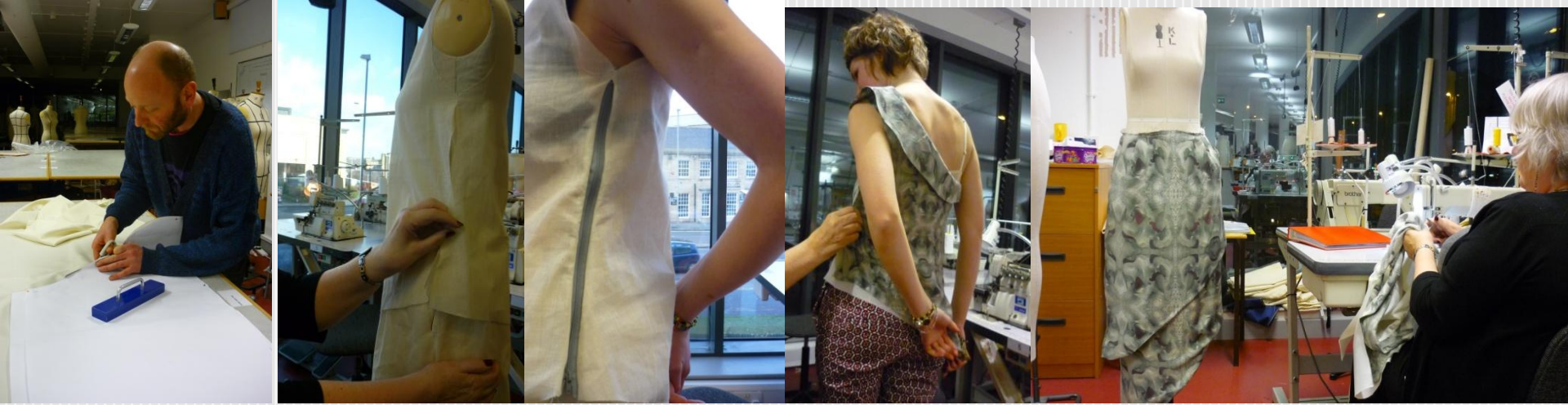
Pattern design 2D patterns & 3D sample.



2D and 3D Print placement and adjustment in patterns:



Toile 1: 3D virtual sample designed from costume



Toile 2: Patterns plotted from Optitex - Patterns cut and re-designed during physical sampling & toile processes on a live model to create a fitted asymmetrical skirt and top. Virtual patterns and 3D sample also adjusted in Optitex.





Credits:

Photography: Linda Lewis - Design Resource Coordinator/ CAD & IT Technician
Model: Agne Andriulionyte - BA(Hons) Fashion Design with Marketing



- ***Conclusions:***

- **Through TALI funding this research has identified and explored trans-disciplinary approaches and methods for digital pattern modelling, extracting patterns and shapes from sculpted 3D models and digital print design using integrated 3D technologies.**
 - **Practice based approach to developing user methods for evaluating effectiveness of 3D digital sculpting software Mudbox, polygon modelling software 3D Studio Max, Maya and 2D 3D pattern design software Optitex & Assyst Bullmer.**
 - **Analysis of digitally sculpting tools for 3D concept creation with BA Costume design students, digital moulage, developing colour palettes, and texturing the surface of a digital human character or model for future introduction into Undergraduate and Postgraduate practice in Fashion & Textiles at University of Huddersfield.**
 - **Integrated and transparent evolution of creative (Industry and Education) collaborative thinking and methodologies for furthering best practice in learning and teaching innovation.**
- 