Une infrastructure pour (ré-)ingénierer des configurateurs web

Une approche IDM

Mathieu Acher
Maître de Conférences
mathieu.acher@irisa.fr

UNIVERSITÉ DE RENNES 1

istic Informatique Électronique

Material

http://mathieuacher.com/teaching/SIMPLE-MIAGE2/projet/

1. Trims/Series | 2. Engine/Transmission | 3. Colour & Style | 4. Options | 5. Summary

S	**from € 19,495.00**
SC	**from € 21,195.00**
SRi	**from € 22,495.00**
SE	**from € 23,495.00**
Elite	**from € 25,495.00**

Standard Equipment Filter Heating/Ventilation

Heating/Ventilation

- Air conditioning with particle filter, manual controls

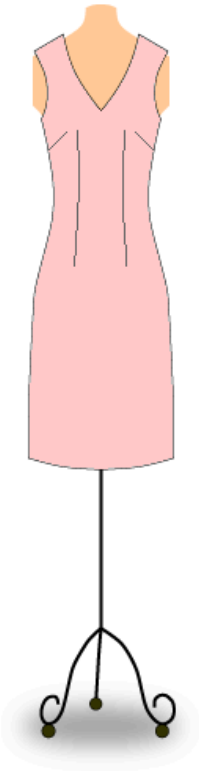
1. Trims/Series | 2. Engine/Transmission | 3. Colour & Style | 4. Options | 5. Summary

Interior | Comfort/Convenience | Option Packs | **Safety/Security** | Seating | Audio/Comms/Nav | Heating/Ventilation | Mechanical | A-Z

Safety/Security

Emergency tire inflation kit	**Standard**
Active front seat head restraints - also adds seat belt unfastened warning light for front passenger's seat	**€ 103.00**
Front and rear parking distance sensors	**€ 407.00**
Tyre Pressure Monitoring System	**€ 155.00**

Design your Dress



Design Options

Choose one option from each column to complete your custom design.

Style:

- marikate
- amy
- christine
- grace
- kathleen
- marilyn

Neckline:

- ○ mandarin
- ○ jewel
- ○ bateau
- ○ square
- ○ deep square
- ○ scoop
- ○ deep scoop
- ○ V
- ◉ low V

Sleeve:

- ◉ sleeveless
- ○ cap
- ○ short
- ○ elbow
- ○ three-quarter
- ○ long

Skirt:

- ◉ straight
- ○ a-line

Length:

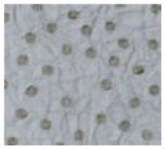
- ◉ knee
- ○ mid
- ○ long

Fabrics

Click on a fabric swatch to see how it looks on the dress form to the right. Filter results by type and search term below. Click on the info button next to the fabric name to see more information about the fabric.

Select a type <All>

Search Apply



textured jacquard dot silk chiffon - silver/soft gold

stretch wool blend pinstripe - gray/white

stretch wool blend pinstripe - black/tan

Italian stretch wool satin - denim blue

floral crepe -

emerald green

dior blue silk

turquoise silk

1. FABRIC 2. STYLE 3. PERSONALIZE 4. SIZE 5. SUMMARY

$79

267 Fabrics: Page **1** 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

NEXT STEP

SAVE DESIGN

FILTER FABRICS | SELECTED

- $0-$100 (basics)
- $100-$150 (really nice)
- $150-$200 (even nicer)
- $200+ (as good as it gets)
- All

Color

All

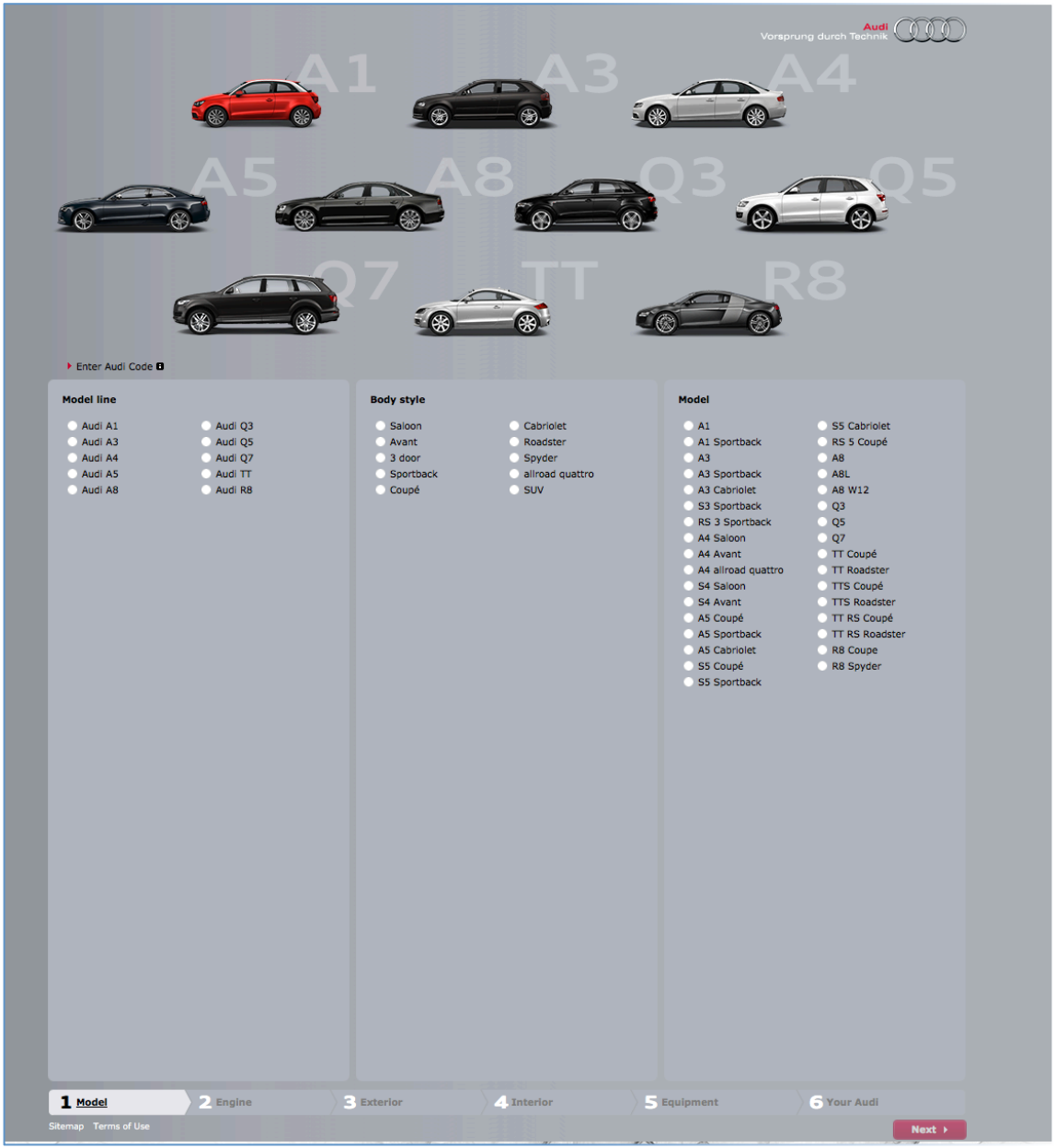
Pattern

- Grid
- Solid
- Stripes
- Plaid
- Gingham
- Other
- All

Wrinkle Free

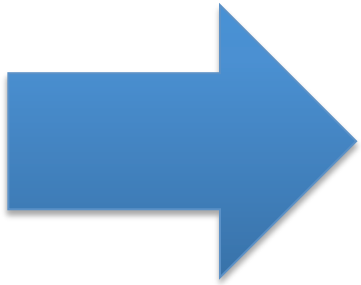
Non-Iron Only

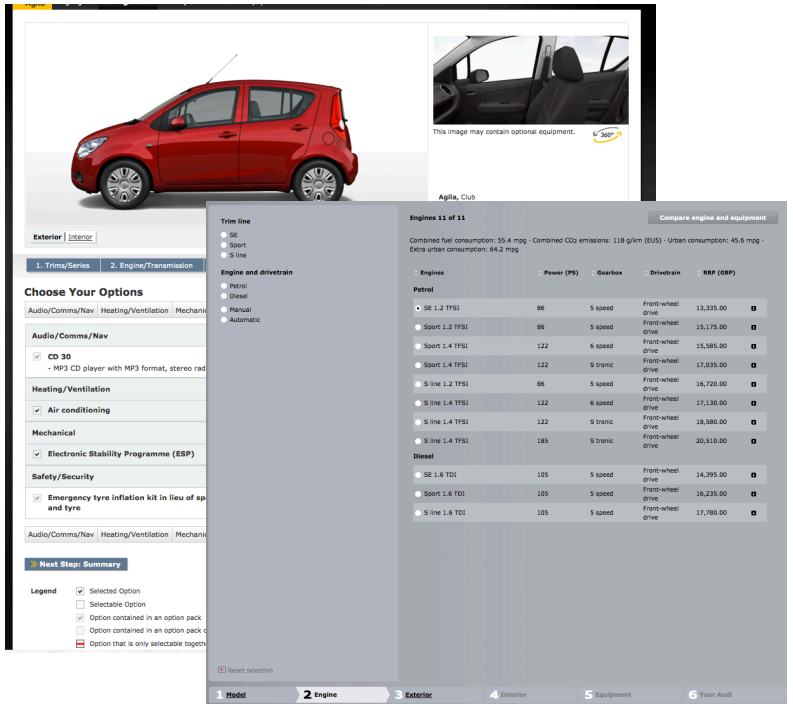
More filters


Audi
Vorsprung durch Technik
A1
A3
A4
A5
A8
Q3
Q5
Q7
TT
R8
Enter Audi Code
Model line
Audi A1
Audi A3
Audi A4
Audi A5
Audi A8
Audi Q3
Audi Q5
Audi Q7
Audi TT
Audi R8
Body style
Saloon
Avant
3 door
Sportback
Coupé
Cabriolet
Roadster
Spyder
allroad quattro
SUV
Model
A1
A1 Sportback
A3
A3 Sportback
A3 Cabriolet
S3 Sportback
RS 3 Sportback
A4 Saloon
A4 Avant
A4 allroad quattro
S4 Saloon
S4 Avant
A5 Coupé
A5 Sportback
A5 Cabriolet
S5 Coupé
S5 Sportback
S5 Cabriolet
RS 5 Coupé
A8
A8L
A8 W12
Q3
Q5
Q7
TT Coupé
TT Roadster
TTS Coupé
TTS Roadster
TT RS Coupé
TT RS Roadster
R8 Coupe
R8 Spyder
1 Model
2 Engine
3 Exterior
4 Interior
5 Equipment
6 Your Audi
Sitemap
Terms of Use
Next

Une infrastructure basée sur l'IDM

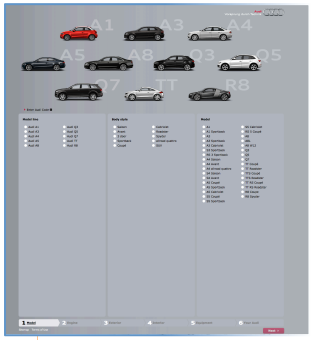
Models
And
Languages

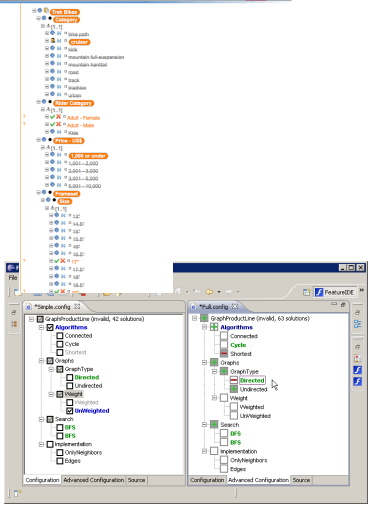


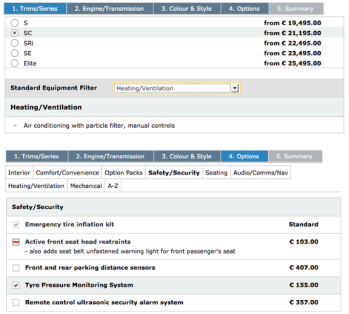


Solution flexible et générique

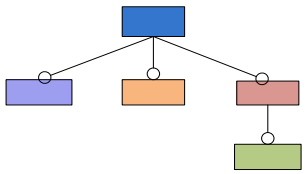
Models
And
Languages







Vue d'ensemble de l'approche

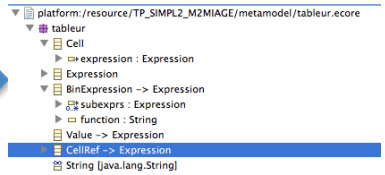


Feature Model
=
Hierarchy with mandatory, optional, exclusive/inclusive features and their (complex constraints)

TP3

TP3/TP4

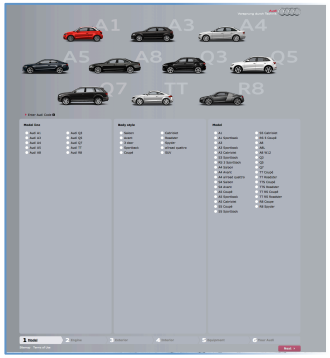
FM2Widg



GUI Model
=
Widgets
Layout/Organization
Styling

TP1+2

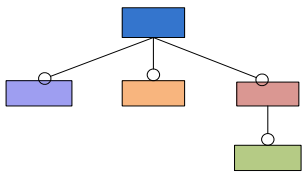
Widg2HTML5



TVL/FAMILIAR

Your Metamodel

Vue d'ensemble de l'approche



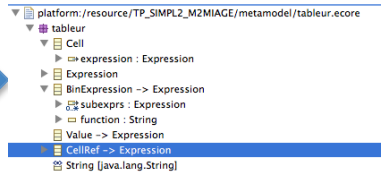
Feature Model
=
Hierarchy with mandatory, optional, exclusive/inclusive features and their (complex constraints)

TP2

TVL/FAMILIAR

TP3/TP4

FM2Widg



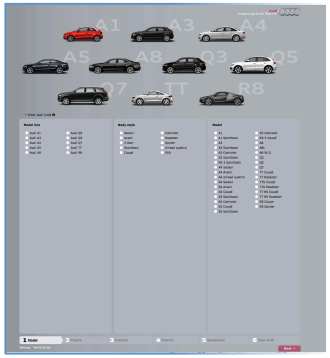
GUI Model
=
Widgets
Layout/Organization
Styling

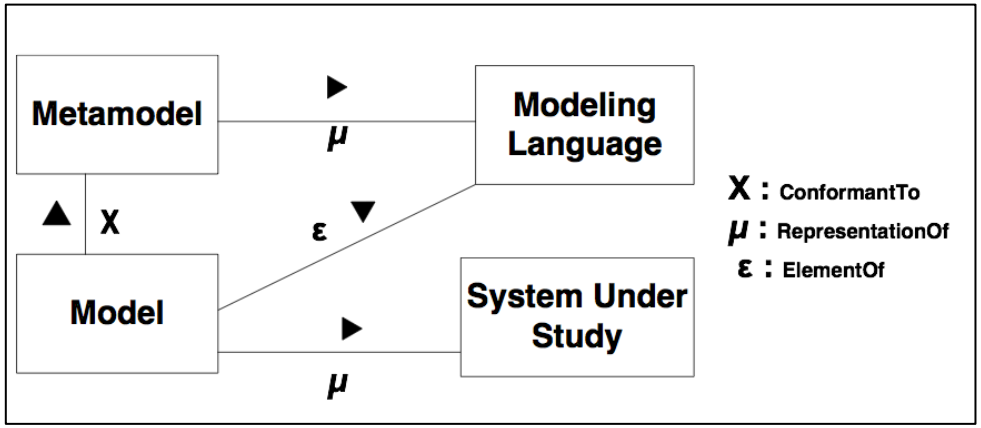
TP1

Your Metamodel

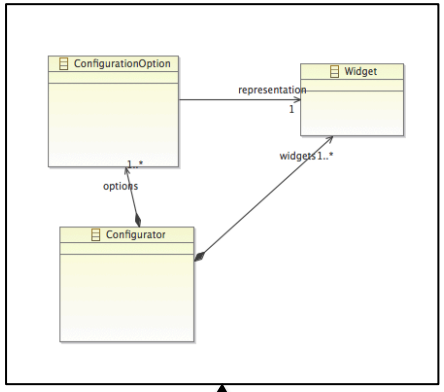
TP5/TP6

Widg2GWT



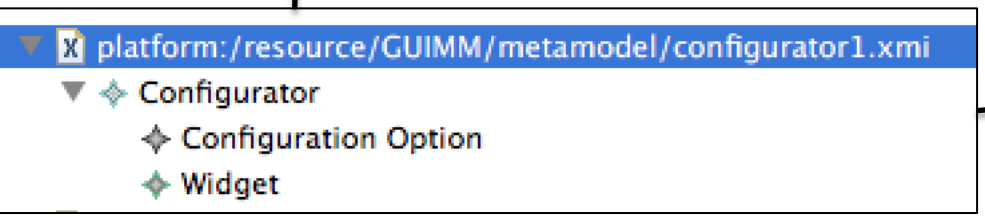


Rendering aspects of configuration options



GUI MM

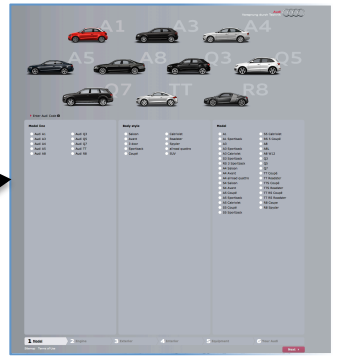
ConformantTo

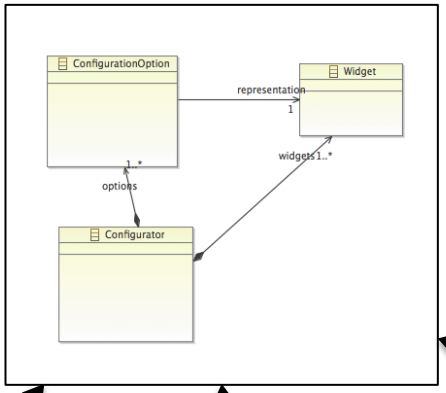


GUI Model

RepresentationOf

Configurator





GUI MM

ConformantTo

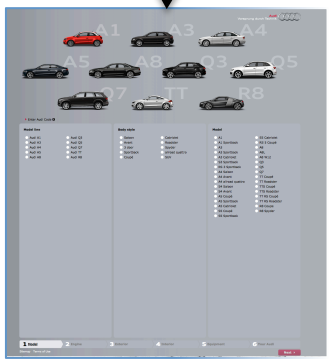
platform:/resource/GUIMM/metamodel/configurator1.xmi
Configurator
Configuration Option
Widget

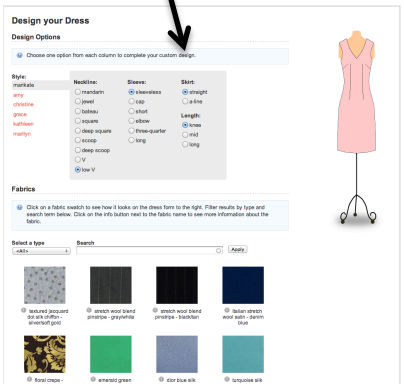
platform:/resource/GUIMM/model/configurator.xmi
Configurator
Configuration Option
Configuration Option
Widget
Widget

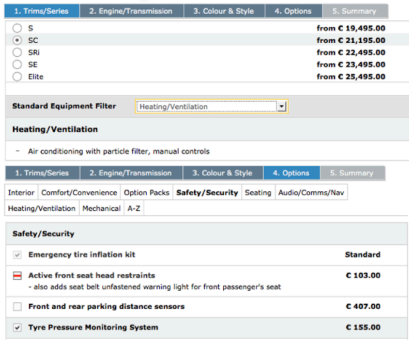
platform:/resource/GUIMM/model/configurator.xmi
Configurator
Configuration Option
Configuration Option
Configuration Option
Widget
Widget
Widget

GUI Models

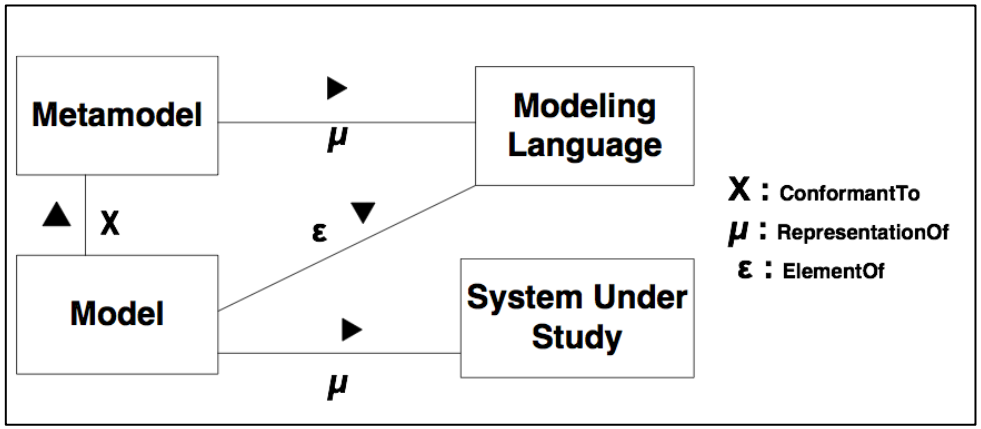
RepresentationOf



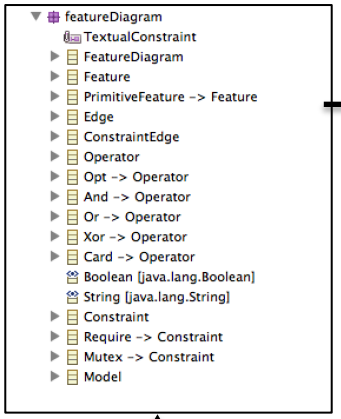




Configurator 1 Configurator 2 … Configurator 10



Logical aspects of configuration options



Feature Model MM

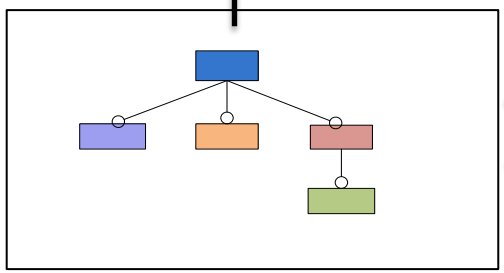
TVL or FAMILIAR languages

RepresentationOf

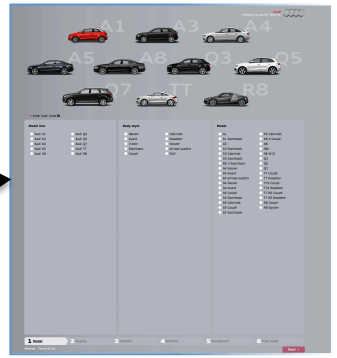
ConformantTo

ElementOf

Configurator

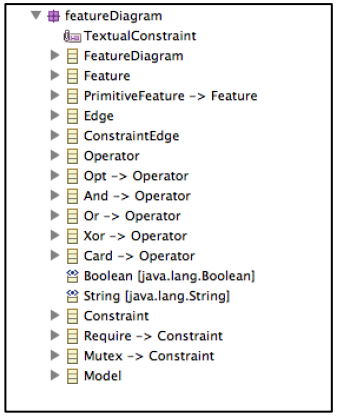


RepresentationOf

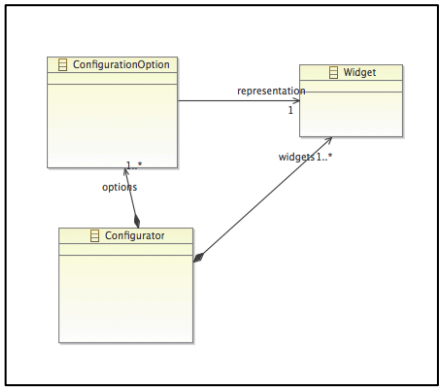


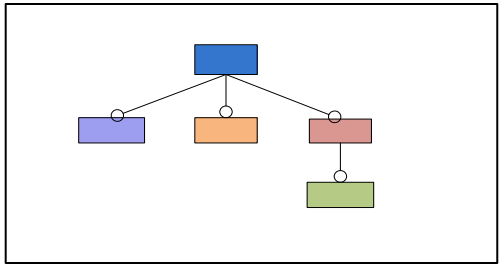
Feature Model

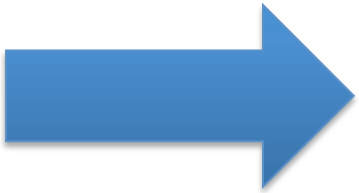
Feature Model MM

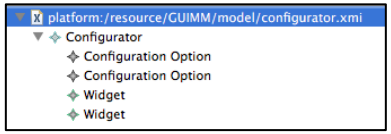


GUI MM

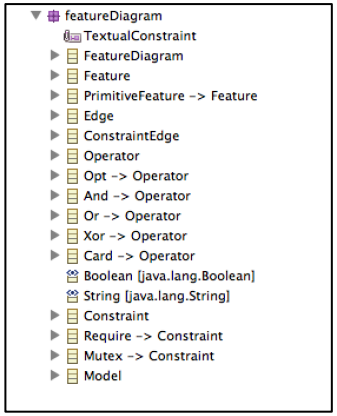




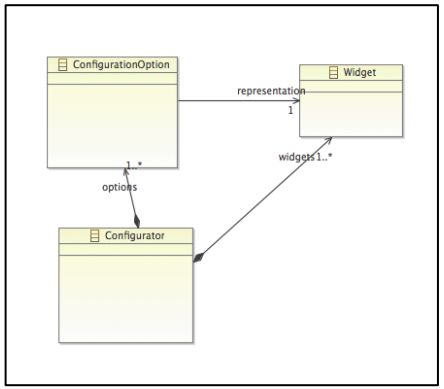


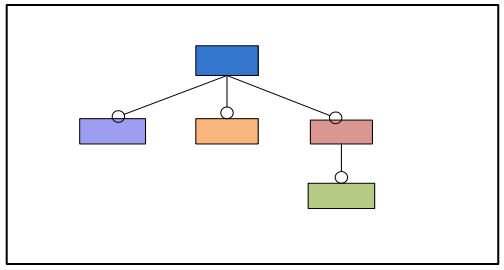


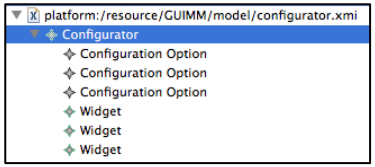
Feature Model MM

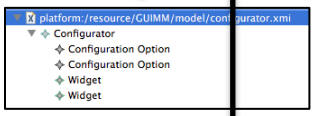


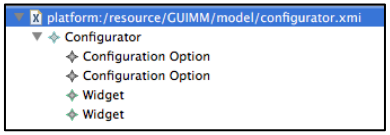
GUI MM



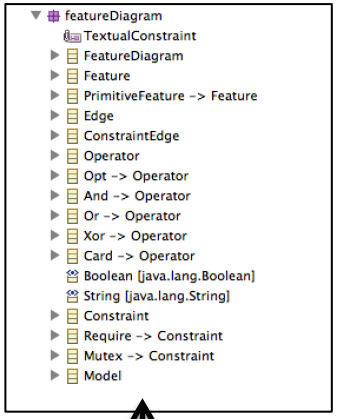




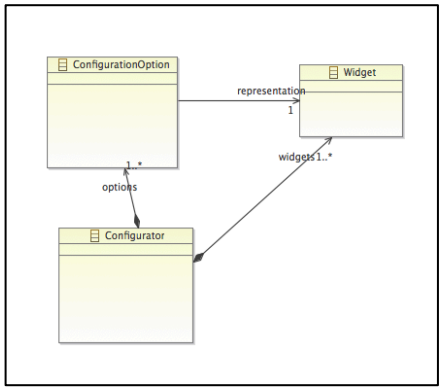


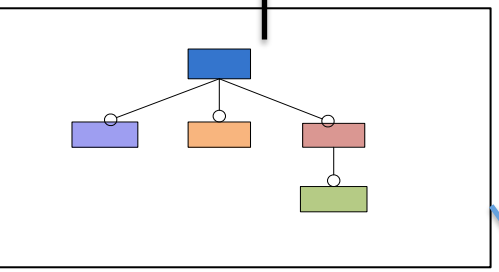


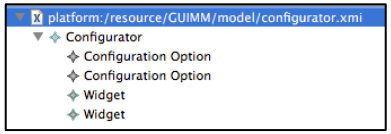
Feature Model MM



GUI MM







Domain-Specific Language *FM2WidgCustomizer*

FM2Widg

Design your Dress

Design Options

Choose one option from each column to complete your custom design.

Style:

- marikate
- amy
- christine
- grace
- kathleen
- marilyn

Neckline:

- ○ mandarin
- ○ jewel
- ○ bateau
- ○ square
- ○ deep square
- ○ scoop
- ○ deep scoop
- ○ V
- ◉ low V

Sleeve:

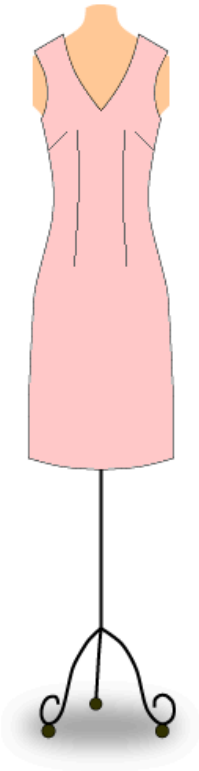
- ◉ sleeveless
- ○ cap
- ○ short
- ○ elbow
- ○ three-quarter
- ○ long

Skirt:

- ◉ straight
- ○ a-line

Length:

- ◉ knee
- ○ mid
- ○ long

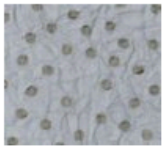


Fabrics

Click on a fabric swatch to see how it looks on the dress form to the right. Filter results by type and search term below. Click on the info button next to the fabric name to see more information about the fabric.

Select a type <All>

Search Apply


textured jacquard dot silk chiffon - silver/soft gold


stretch wool blend pinstripe - gray/white


stretch wool blend pinstripe - black/tan


Italian stretch wool satin - denim blue


floral crepe -


emerald green


dior blue silk


turquoise silk

XOR-groups

Design your Dress

Design Options

Choose one option from each column to complete your custom design.

Style:

- marikate
- amy
- christine
- grace
- kathleen
- marilyn

Neckline:

- mandarin
- jewel
- bateau
- square
- deep square
- scoop
- deep scoop
- V
- low V

Sleeve:

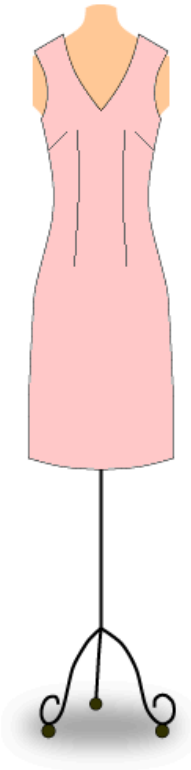
- sleeveless
- cap
- short
- elbow
- three-quarter
- long

Skirt:

- straight
- a-line

Length:

- knee
- mid
- long

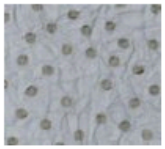


Fabrics

Click on a fabric swatch to see how it looks on the dress form to the right. Filter results by type and search term below. Click on the info button next to the fabric name to see more information about the fabric.

Select a type <All>

Search Apply



textured jacquard dot silk chiffon - silver/soft gold

stretch wool blend pinstripe - gray/white

stretch wool blend pinstripe - black/tan

Italian stretch wool satin - denim blue

floral crepe -

emerald green

dior blue silk

turquoise silk

Parent of a group (label, not selectable)

Design your Dress

Design Options

Choose one option from each column to complete your custom design.

Style:

- marikate
- amy
- christine
- grace
- kathleen
- marilyn

Neckline:

- ○ mandarin
- ○ jewel
- ○ bateau
- ○ square
- ○ deep square
- ○ scoop
- ○ deep scoop
- ○ V
- ◉ low V

Sleeve:

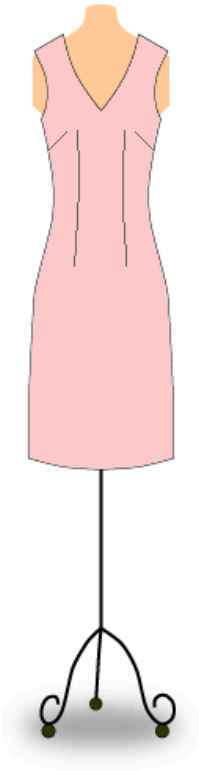
- ◉ sleeveless
- ○ cap
- ○ short
- ○ elbow
- ○ three-quarter
- ○ long

Skirt:

- ◉ straight
- ○ a-line

Length:

- ◉ knee
- ○ mid
- ○ long



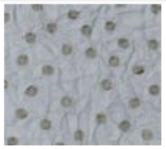
Fabrics

Click on a fabric swatch to see how it looks on the dress form to the right. Filter results by type and search term below. Click on the info button next to the fabric name to see more information about the fabric.

Select a type <All>

Search Apply

XOR-groups


textured jacquard dot silk chiffon - silver/soft gold


stretch wool blend pinstripe - gray/white


stretch wool blend pinstripe - black/tan


Italian stretch wool satin - denim blue


floral crepe -


emerald green


dior blue silk


turquoise silk

Design your Dress

Design Options

Choose one option from each column to complete your custom design.

Style:

- marikate
- amy
- christine
- grace
- kathleen
- marilyn

Neckline:

- ○ mandarin
- ○ jewel
- ○ bateau
- ○ square
- ○ deep square
- ○ scoop
- ○ deep scoop
- ○ V
- ◉ low V

Sleeve:

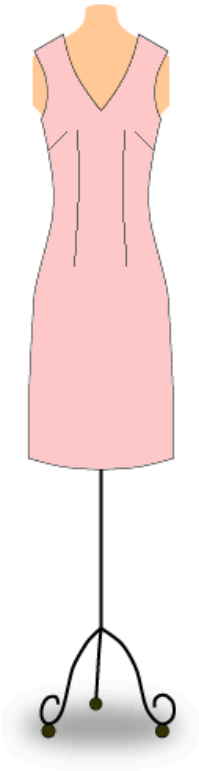
- ◉ sleeveless
- ○ cap
- ○ short
- ○ elbow
- ○ three-quarter
- ○ long

Skirt:

- ◉ straight
- ○ a-line

Length:

- ◉ knee
- ○ mid
- ○ long



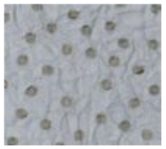
Fabrics

Click on a fabric swatch to see how it looks on the dress form to the right. Filter results by type and search term below. Click on the info button next to the fabric name to see more information about the fabric.

Select a type <All>

Search Apply

XOR-groups?


textured jacquard dot silk chiffon - silver/soft gold


stretch wool blend pinstripe - gray/white


stretch wool blend pinstripe - black/tan


Italian stretch wool satin - denim blue


floral crepe -


emerald green


dior blue silk


turquoise silk

Design your Dress

Design Options

Choose one option from each column to complete your custom design.

Style:

- marikate
- amy
- christine
- grace
- kathleen
- marilyn

Neckline:

- ○ mandarin
- ○ jewel
- ○ bateau
- ○ square
- ○ deep square
- ○ scoop
- ○ deep scoop
- ○ V
- ◉ low V

Sleeve:

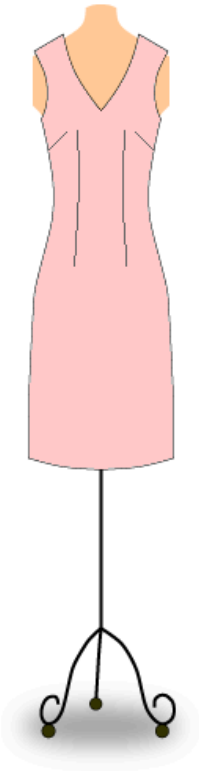
- ◉ sleeveless
- ○ cap
- ○ short
- ○ elbow
- ○ three-quarter
- ○ long

Skirt:

- ◉ straight
- ○ a-line

Length:

- ◉ knee
- ○ mid
- ○ long

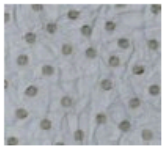


Fabrics

Click on a fabric swatch to see how it looks on the dress form to the right. Filter results by type and search term below. Click on the info button next to the fabric name to see more information about the fabric.

Select a type **Search** Apply

Parent of a group?
(label, not selectable)


textured jacquard dot silk chiffon - silver/soft gold


stretch wool blend pinstripe - gray/white


stretch wool blend pinstripe - black/tan


Italian stretch wool satin - denim blue


floral crepe -


emerald green


dior blue silk


turquoise silk

Design your Dress

Design Options

Choose one option from each column to complete your custom design.

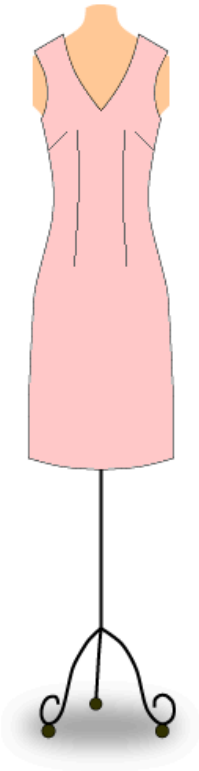
Style:
- marikate
- amy
- christine
- grace
- kathleen
- marilyn

Neckline:
- mandarin
- jewel
- bateau
- square
- deep square
- scoop
- deep scoop
- V
- low V

Sleeve:
- sleeveless
- cap
- short
- elbow
- three-quarter
- long

Skirt:
- straight
- a-line

Length:
- knee
- mid
- long

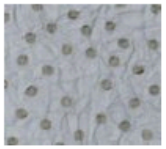


Fabrics

Click on a fabric swatch to see how it looks on the dress form to the right. Filter results by type and search term below. Click on the info button next to the fabric name to see more information about the fabric.

Select a type <All>

Search Apply


textured jacquard dot silk chiffon - silver/soft gold


stretch wool blend pinstripe - gray/white


stretch wool blend pinstripe - black/tan


Italian stretch wool satin - denim blue


floral crepe -


emerald green


dior blue silk


turquoise silk

Mandatory features? (not selectable)

Design your Dress

Design Options

Choose one option from each column to complete your custom design.

Style:

marikate
amy
christine
grace
kathleen
marilyn

Neckline:

jewel
bateau
square
deep square
scoop
deep scoop
V
low V

Sleeve:

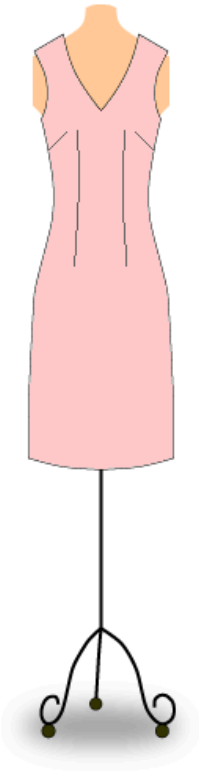
cap
short
elbow
three-quarter
long

Skirt:

a-line

Length:

knee
mid
long



Hierarchy?

Fabrics

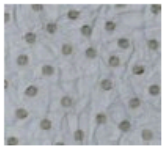
Click on a fabric swatch to see how it looks on the dress form to the right. Filter results by type and search term below. Click on the info button next to the fabric name to see more information about the fabric.

Select a type

<All>

Search

Apply



textured jacquard dot silk chiffon - silver/soft gold

stretch wool blend pinstripe - gray/white

stretch wool blend pinstripe - black/tan

Italian stretch wool satin - denim blue

floral crepe -

emerald green

dior blue silk

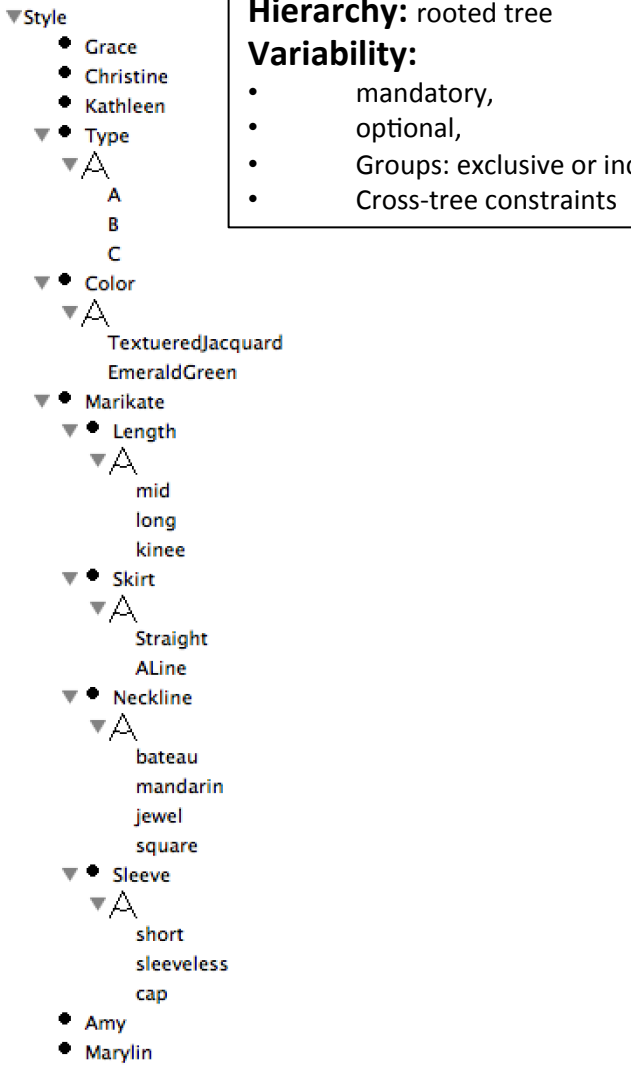
turquoise silk

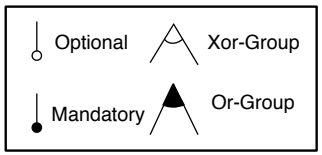
Un Feature Model (possible)

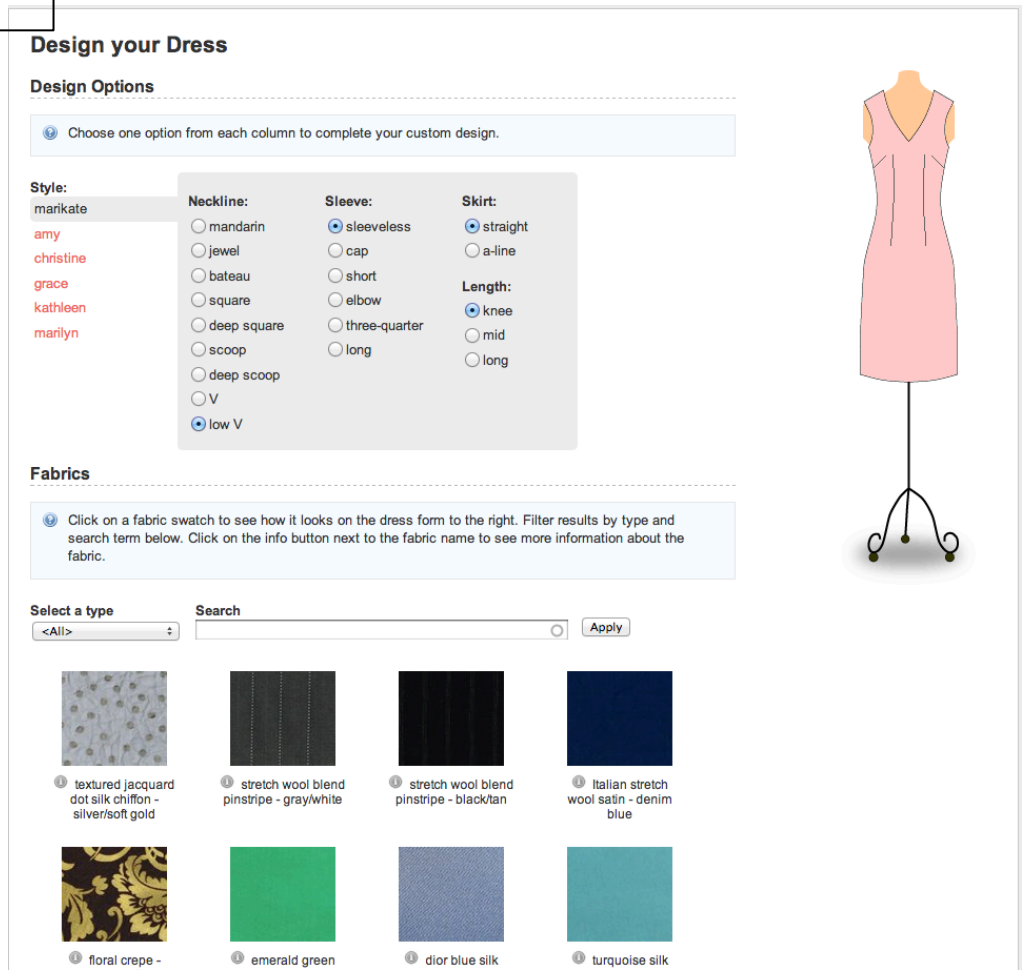
Hierarchy: rooted tree

Variability:

- mandatory,
- optional,
- Groups: exclusive or inclusive features
- Cross-tree constraints





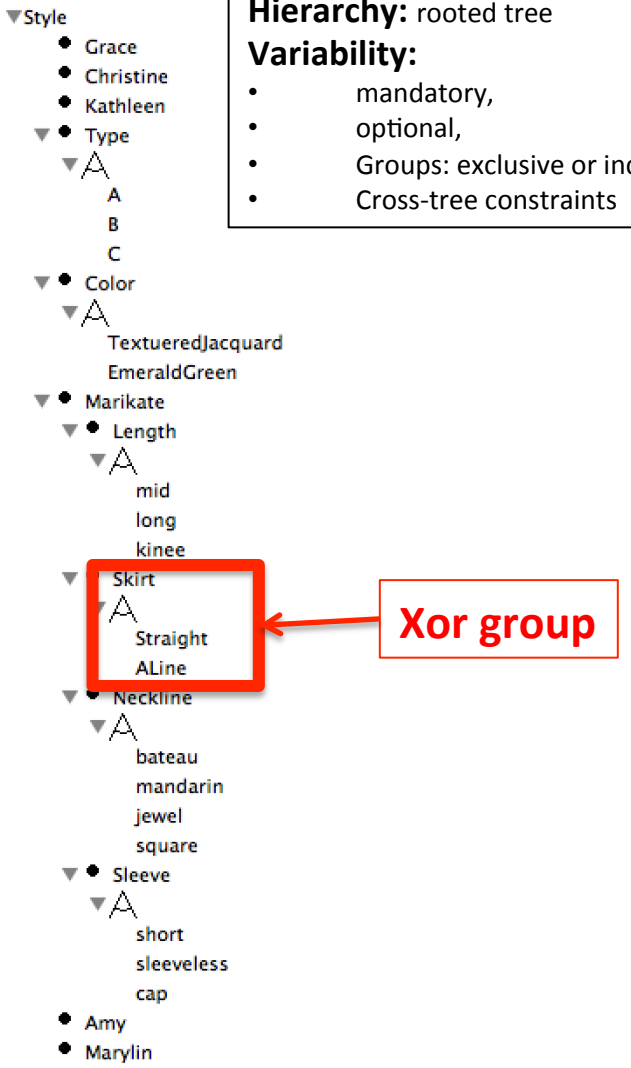


Un Feature Model (possible)

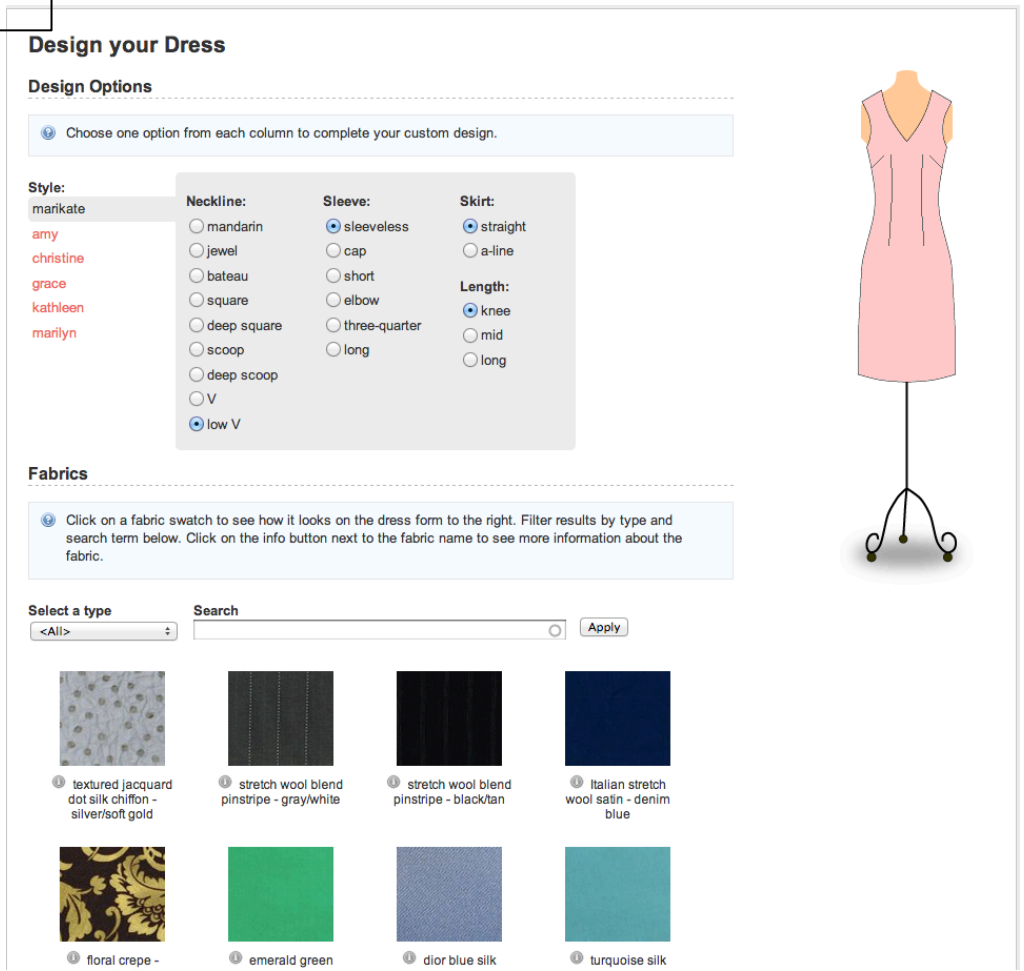
Hierarchy: rooted tree

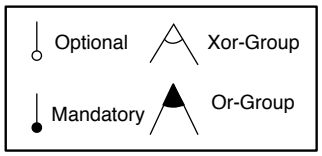
Variability:

- mandatory,
- optional,
- Groups: exclusive or inclusive features
- Cross-tree constraints



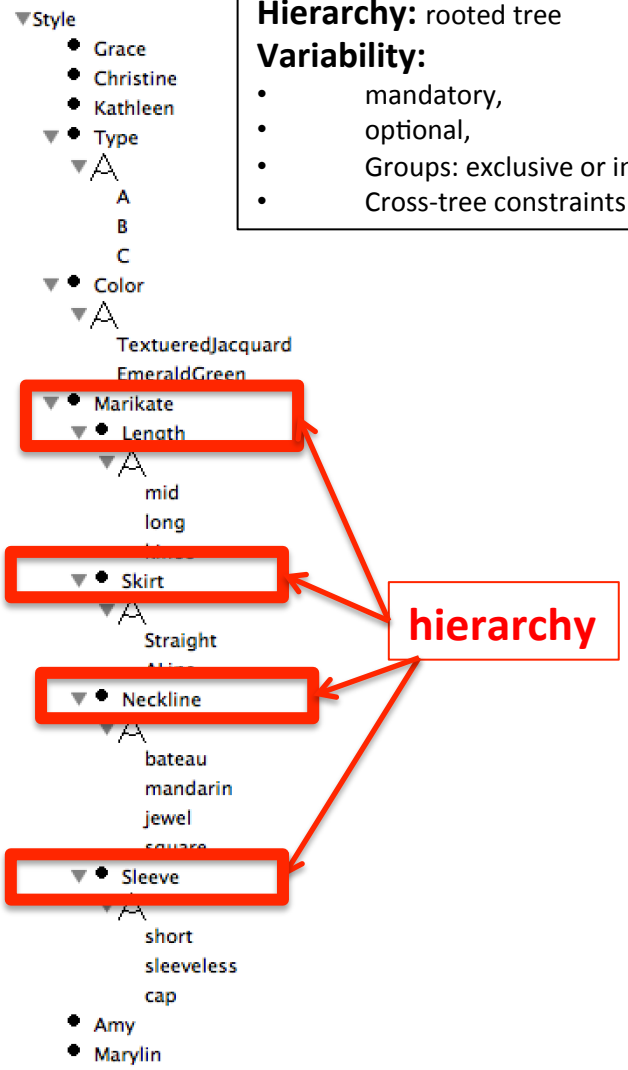
Xor group

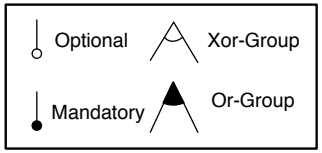


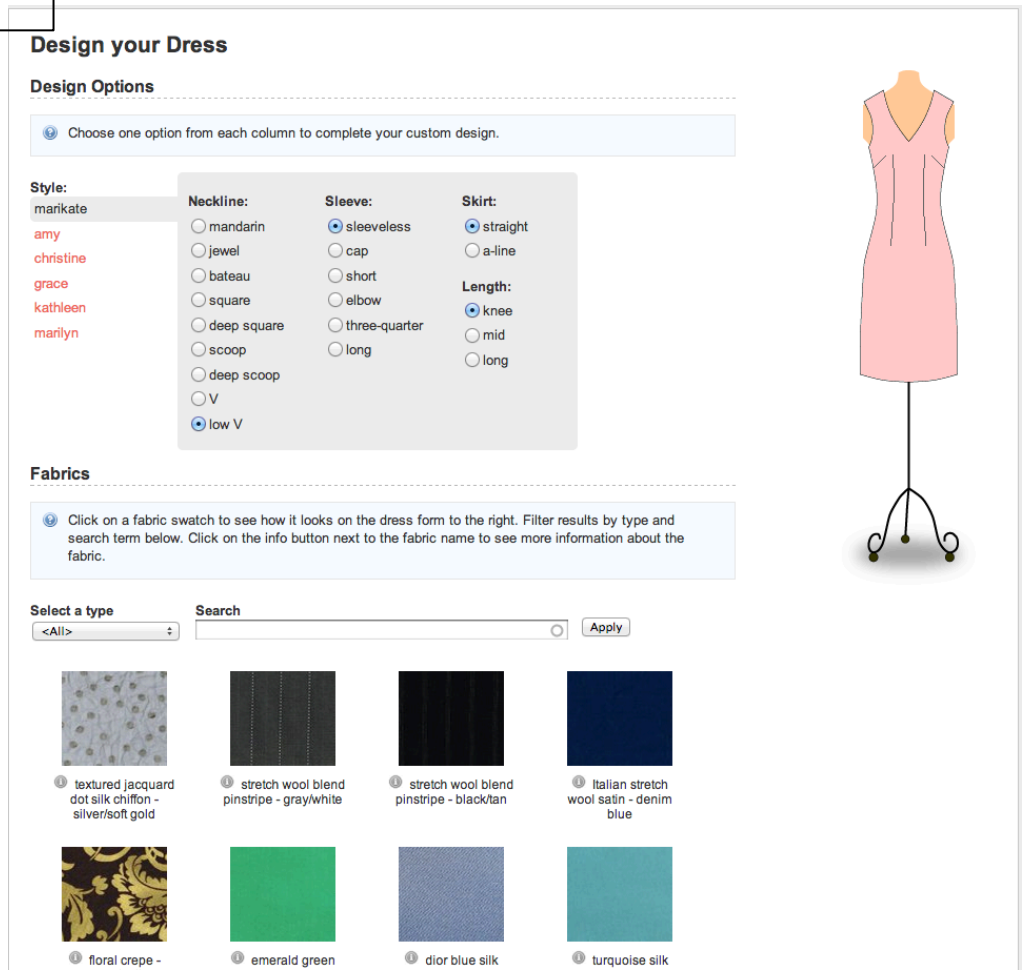


Un Feature Model (possible)

Hierarchy: rooted tree
Variability:
- mandatory,
- optional,
- Groups: exclusive or inclusive features
- Cross-tree constraints





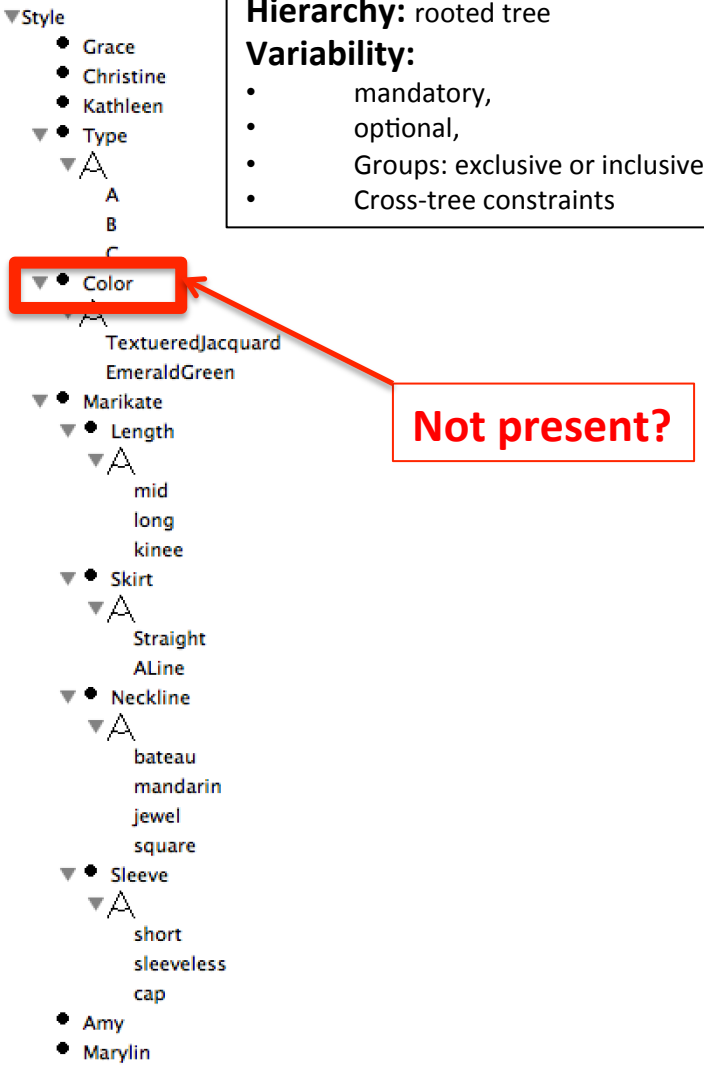


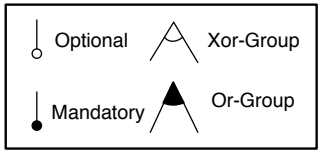
Un Feature Model (possible)

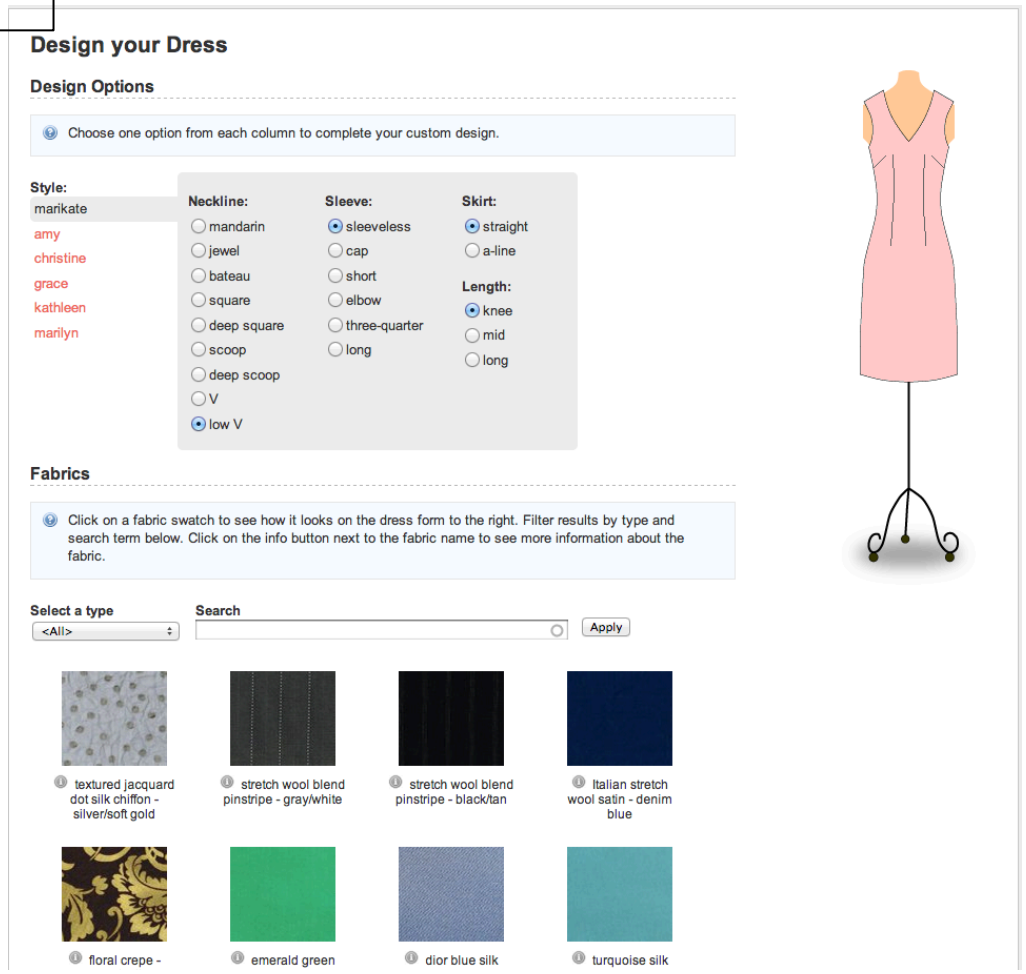
Hierarchy: rooted tree

Variability:

- mandatory,
- optional,
- Groups: exclusive or inclusive features
- Cross-tree constraints







TP1+2

- Groupe de 2
  - Un groupe de 3
- Analyse du domaine des configurateurs
  - Sélection de 10 configurateurs (cf fichier excel)
  - Points communs et variations
  - “Features”
- Métamodélisation (avec Ecore et Eclipse)
  - des “widgets” représentant les options de configurations
  - de la manière dont ils sont organisés (e.g., “tabs”)
- Modèles de widgets (avec Kermeta)
  - Montrer des “patterns” représentatifs
  - Conforme au métamodèle

TP 3

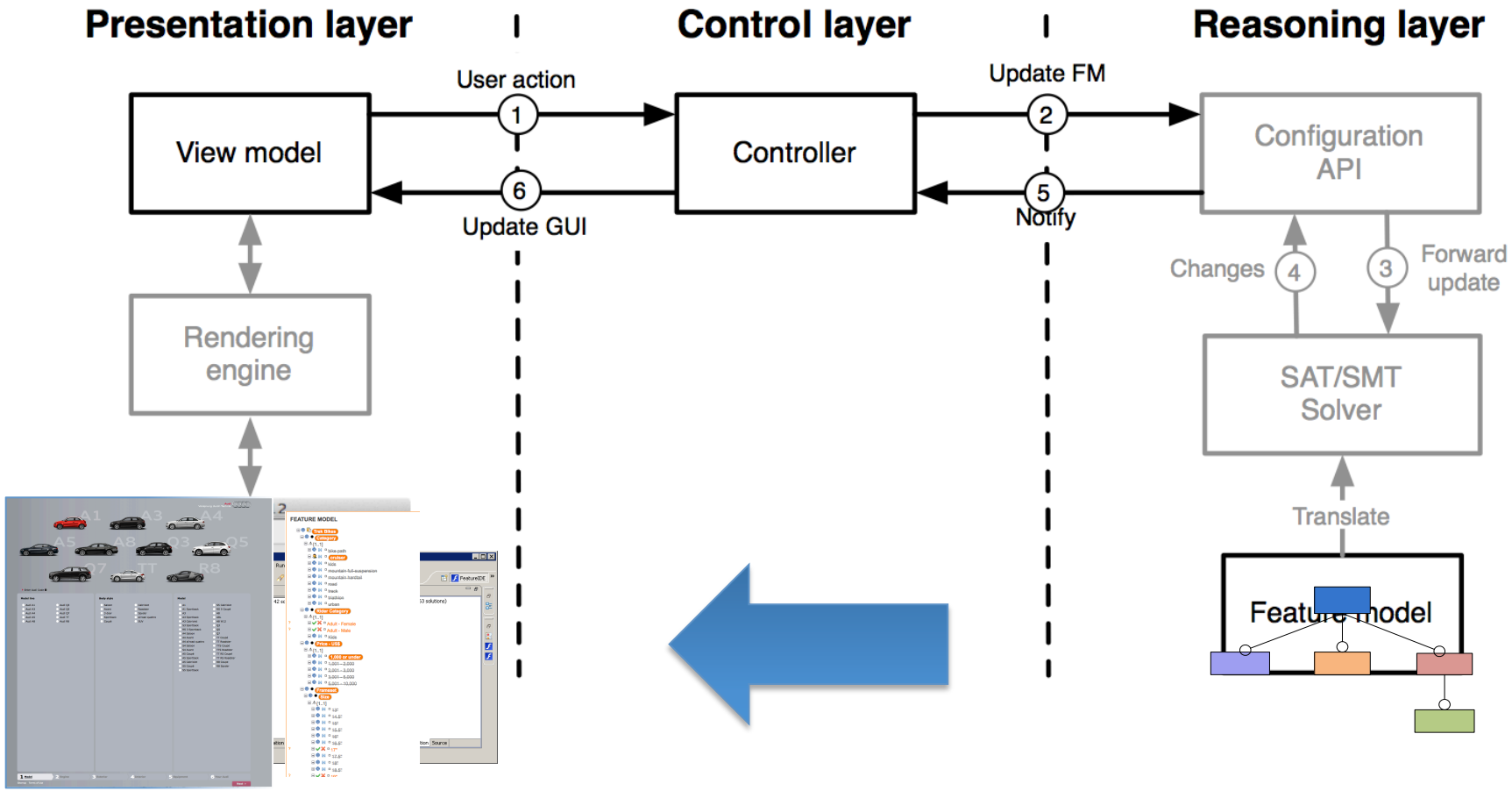
- Sélectionner un configurateur et élaborer le feature model correspondant
  - Télécharger un Eclipse avec Xtext: http://www.eclipse.org/Xtext/
  - Installer le plugin TVL update site dans Eclipse avec l'url suivante: http://www.info.fundp.ac.be/~qbo/TVL/

- Identifier des “patterns” de transformation
  - identifier comment les constructions offertes par le formalisme des feature models (e.g., hiérarchie, groupe Xor) peuvent être restituées graphiquement

- Implémenter ces transformations en Kermeta
  - transformation en considérant les métamodèles de TVL et votre métamodèle (GUI), le métamodèle TVL est disponible ici: http://mathieuacher.com/teaching/SIMPLE-MIAGE2/projet/
  - Pour convertir un modèle TVL (textuel) en XMI (exploitable par Kermeta), utilisez le converteur TVLExporter (cf adresse)

TP3

MVC Architecture



Model-based approach