DRIVE AI INTO FIT FASHION

Miguel Arantes – 10, 2023

TODAY'S JOURNEY
THROUGH FIT, AI AND FASHION

1. *Framing the Challenge*
2. *Delving into Data*
3. *Crafting the Model*
4. *Closing Thoughts*

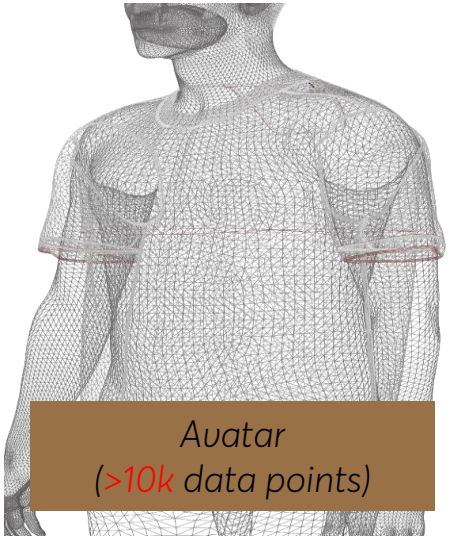
FRAMING THE CHALLENGE

HOW IS CALCULATED THE FIT?
PAST (TODAY REALITY) VS FUTURE (OUR MODEL)

Manual measures from the t-shirt.

Each t-shirt is done by different person.

Manual Measurements
(<10 data points)



Avatar
(>10k data points)

LET'S PLAY A GAME?!

DID YOU GUESS?

THE FIT AIMS TO DIGITIZE AND QUANTIFY THE FIT OF GARMENTS, SUCH THAT WE CAN ACCURATELY LABEL FIT OF NEWLY DESIGNED PRODUCTS

DELVING INTO DATA

CHALLENGES
WHERE IS THE DATA?

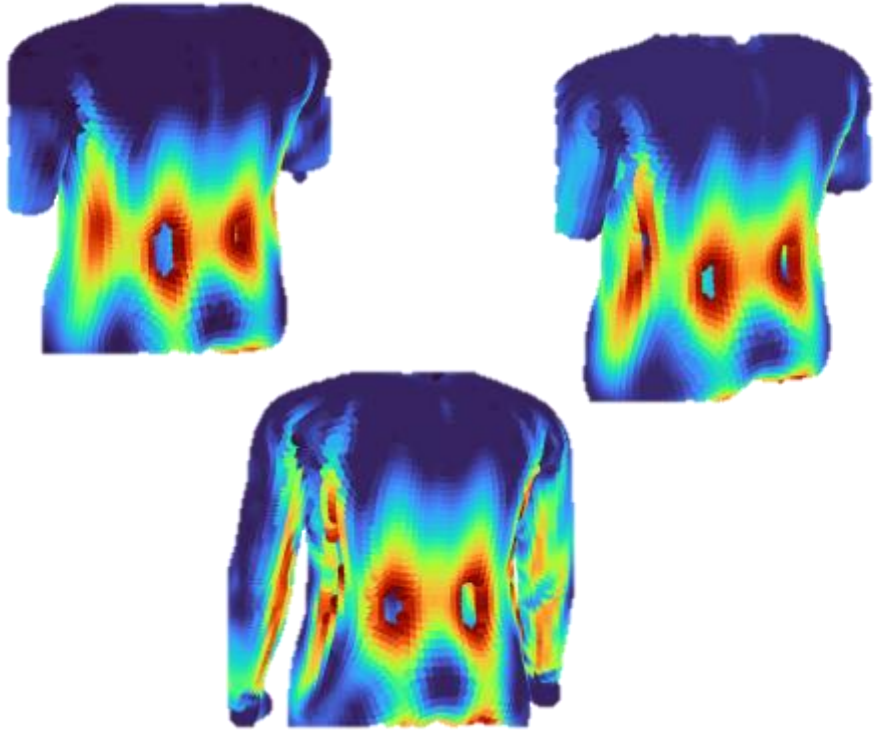
Manual process of data retrieval
We are working to automate the process.

Data across multiple platforms
We are working to centralize our data lake.

Several individuals are processing the 2D/3D data.
Focusing on gathering all the processes and data, as some are missing.

WHAT IS THE DATA AVAILABLE?

THE REALITY IS 3D!

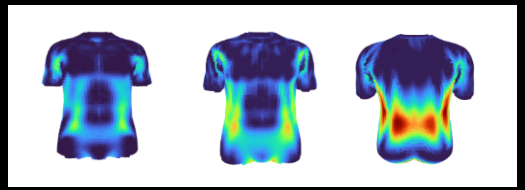


DATA POINTS AND MEASURES
WHAT TO DO WITH THIS MANY DATA?

~10K

DATA POINTS

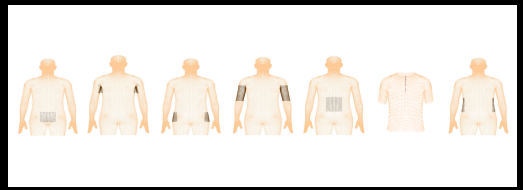
TO MEASURE THE DISTANCE BETWEEN THE GARMENT & BODY IN THE T-SHIRT AREA



7

DISTANCE MEASURES SELECTED

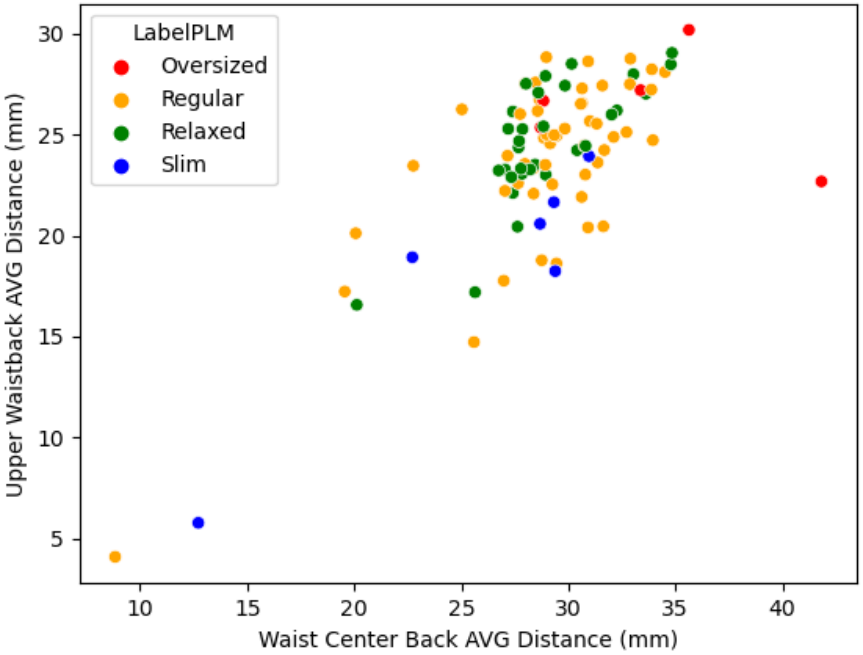
BASED ON USABILITY OF DATA, FEEDBACK FROM DESIGNERS AND DIGITAL CREATION EXPERTS

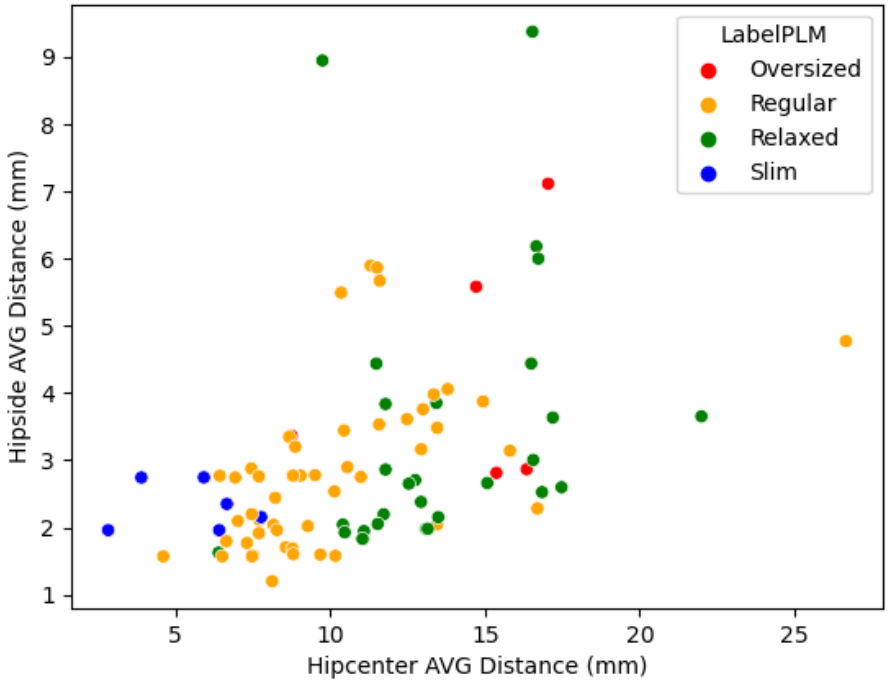


HUGO BOSS

USING DATA TO EVALUATE FIT LABELS

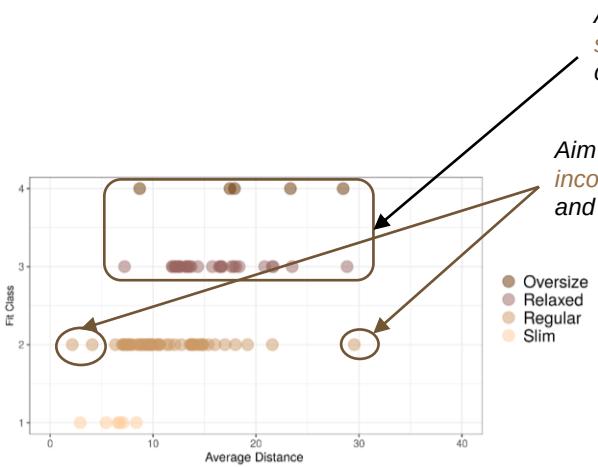
STARTING THE ANALYSIS





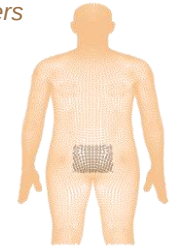
ANALYSE OUR 3D DATA
CAN THE DATA CAN BRING VALUE TO FIT?

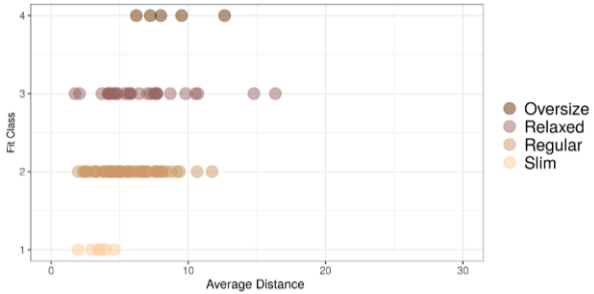
- Each scatterplot shows the distribution of distance measures, separately for each fit class. Each dot in the graphs corresponds to a single product.



Aim to improve the separation of fit classes

Aim to reduce inconsistency and outliers





CRAFTING THE MODEL

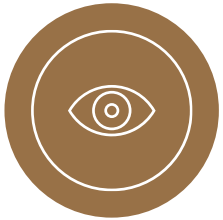
CHALLENGES
HOW TO BUILD THE MODEL?

Lack of similar cases developed or documented in papers.

Selection of the right algorithm and parameters

Build trust within the business for our modelling and discourage the continued use of the old methods.

DEFINITION AND MODELLING
COULD WE?

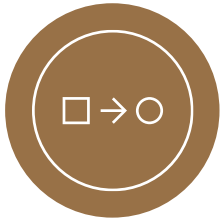


FIX THE DEFINITION OF FIT

The definitions of 'fit' were not standardized; each individual designer could choose the fit of a product as they preferred.

FIX THE AVATAR

While a product's fit is inherently tied to an individual's body, we require consistency to establish a model for calculating that fit.

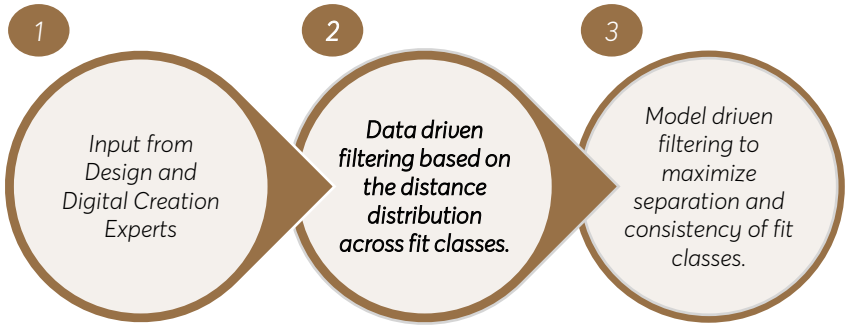


FIX OTHER BODY PART DEFINITIONS

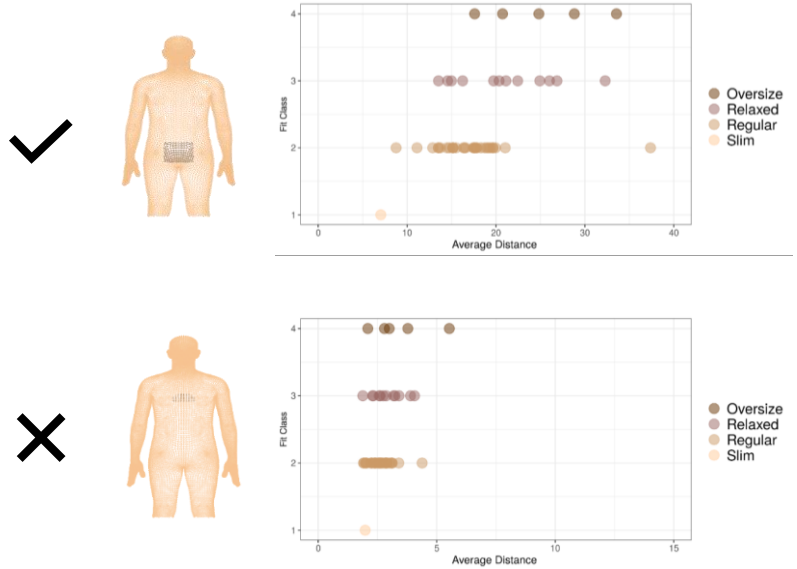
The fit was calculated based on body parts, which has proven to be problematic. Addressing the consistency of other body parts based on the avatar would allow us to calculate fit more accurately.

WHAT FIT DO WE EXPECT AT THE END?

SELECTING BODY PARTS THAT SHOW GOOD SEPARATION BETWEEN FIT
CAN WE USE ALL DEFINED BODY PART?

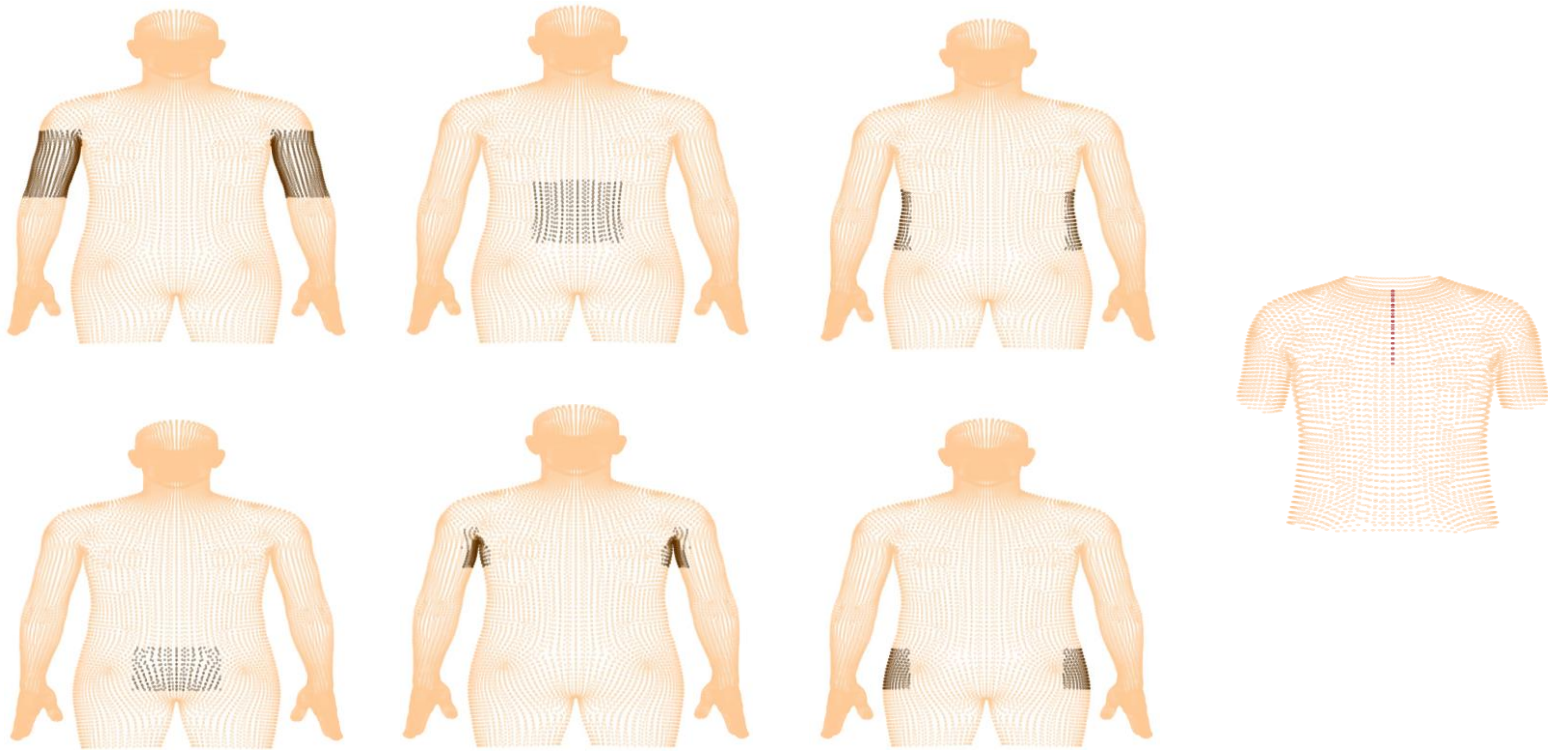


In this Step (2) we identified 7 Distance Measures whose values differ sufficiently between fit classes. On the charts to the right, the average distance at the Hip Center shows a much better separation than the average distance that Chest Center. Hip Center was therefore chosen as a relevant Distance Measure, whereas Chest Center was not.



FIX OTHER BODY PART DEFINITIONS

WHAT BODY?



MODEL SELECTION
HOW MANY MODELS CAN YOU FIT IN YOUR MIND?

OUT OF THE BOX CLASSIFICATION

Random Forest Classifier
Support Vector Machines
Naive Bayes Classifier
Decision Tree Classifier
K-Nearest Neighbors
…

OUT OF THE BOX CLUSTERING

DBSCAN
OPTICS
Mean Shift Clustering
Spectral Clustering
Fuzzy C-means Clustering
…

IN-HOUSE MODEL

An unsupervised approach relying on a proprietary loss function.

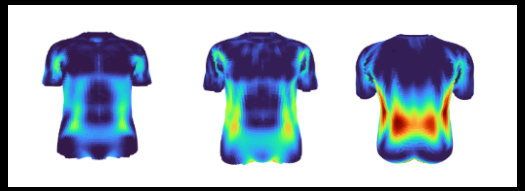
We have developed an in-house clustering technique that effectively organizes data points into groups, known as 'clusters,' based on their shared similarities. This proprietary method plays a pivotal role in unveiling intricate patterns and relationships within our data by intelligently grouping together data points with similar characteristics, particularly in the context of fit points.

THE FIT CLASSIFICATION MODEL
THAT STANDARDIZES FIT LABELS OF PRODUCTS BASED ON BODY PARTS

~10K

DATA POINTS

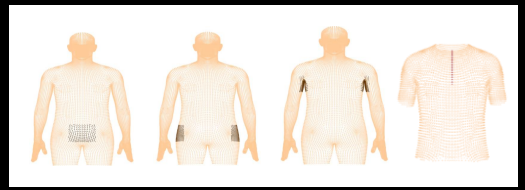
DISTANCE TO THE BODY
STRETCH



BEST

BODY PARTS

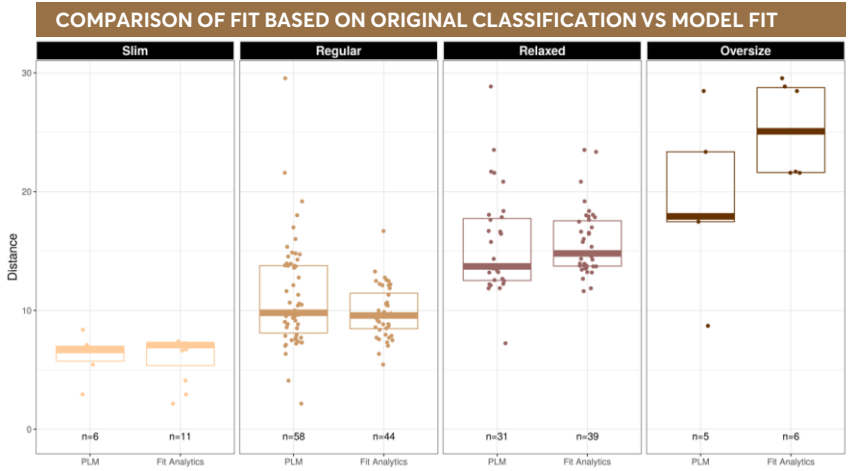
AUTOMATED MODEL SELECTION



CLOSING THOUGHTS

THE MODEL IMPROVES THE FIT CLASSIFICATION THROUGH RELABELING

40% OF THE T-SHIRTS, SHOWING POTENTIAL FOR POSITIVE IMPACT



LEGEND:

Distance from body to hip center

3rd Quartile

Median

1st Quartile

The box contains 50% of all products

AIM OF THE MODEL:

- *Higher concentration of data points as this indicates better classification of T-shirt fit labels (Slim, Regular, Relaxed & Oversize)*
- *Better separation of medians & less variability between T-shirt fit labels as this allows for better distinction of the T-shirt fits that are available*

THE MODEL SHOWS US:

1 THAT WE CAN USE DIGITAL FIT DATA TO PROVIDE A BETTER FIT CLASSIFICATION SYSTEM

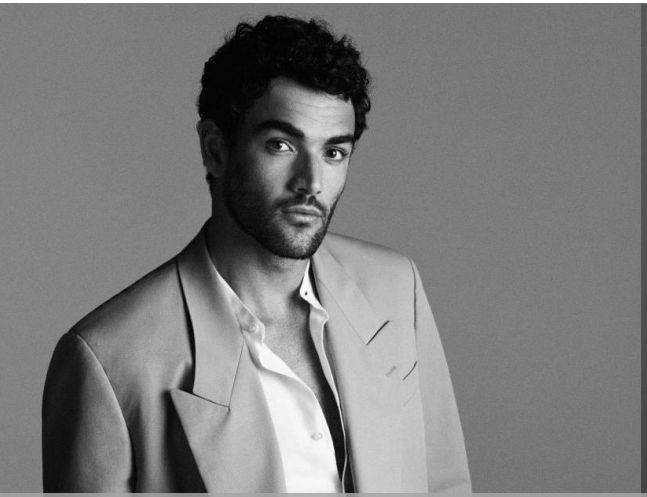
2 THAT THERE ARE A SIGNIFICANT NUMBER OF T-SHIRTS IN OUR POC (~40%) THAT CAN HAVE AN IMPROVED FIT

THE T-SHIRT RESULTS FROM THE POC WILL BE VALIDATED THROUGH LIVE WORKSHOPS WITH DESIGNERS, BRAND AND PRODUCT MANAGERS

THE IMPACT ON RETURN RATES WILL BE TESTED THROUGH AN A/B TESTING IN A LIVE MARKET

RETURN RATES ARE HIGHER FOR T-SHIRTS THAT ON THE ONES RELABEL

THE PROJECTED IMPACTS WHEN DEPLOYED



~15%

Potential decrease in return rates

+

Enhance the customer experience

~40%

Reduced instances of misfit product labelling

OTHER INDUSTRIES THAT CAN BENEFIT FROM THIS MODEL INCLUDE...

AND MANY MORE!

Automotive and Aerospace Industry: *These industries often use 3D scanning technologies and clustering models for defect analysis, quality inspection, and designing complex components.*

Manufacturing and Rapid Prototyping Industry: *In manufacturing, clustering on 3D objects can be used to streamline the production process, conduct quality inspections, and develop precise prototypes.*

Healthcare and Medical Industry: *In the healthcare sector, 3D technology is used to create accurate models of organs and anatomical structures. Clustering can be used for medical image analysis, surgery planning, and medical simulations.*

INQUIRIES AND DISCUSSION

Thank you!

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