UCLA Anderson School of Management

Adidas Data Challenge

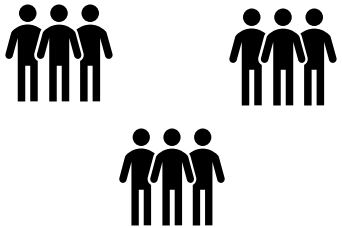
Raffi Sahakyan, Ezhilvel Malar Elangovan, Sharad Jain, Pranay Singla, Marina Makarova

Super scale project goal

Unify the sizing scales and help customers find best fit

Target product:
Adult male and female t-shirt

Target dimensions:
13 measurements were selected for modeling

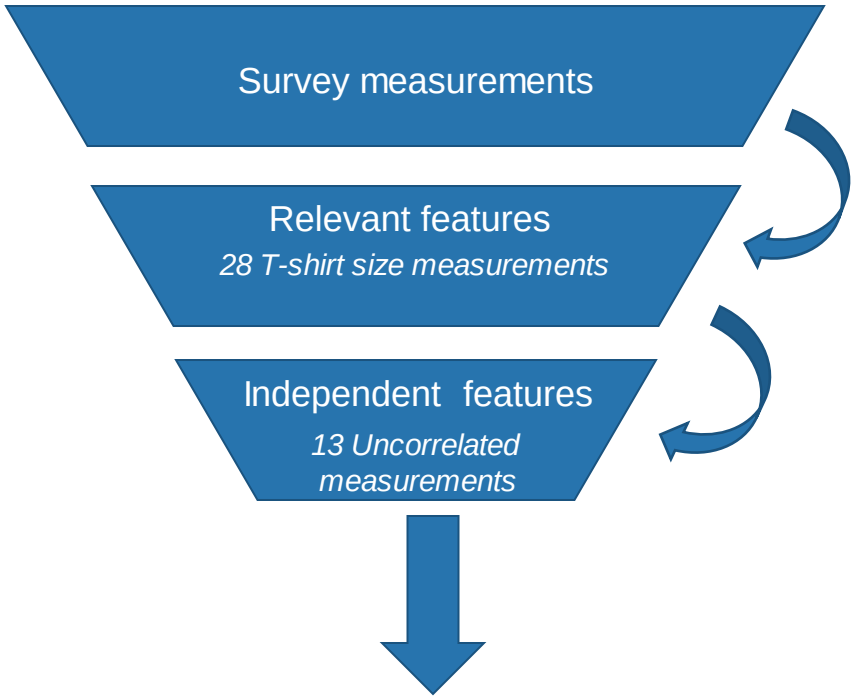


Methodology:
Clustering and Optimization

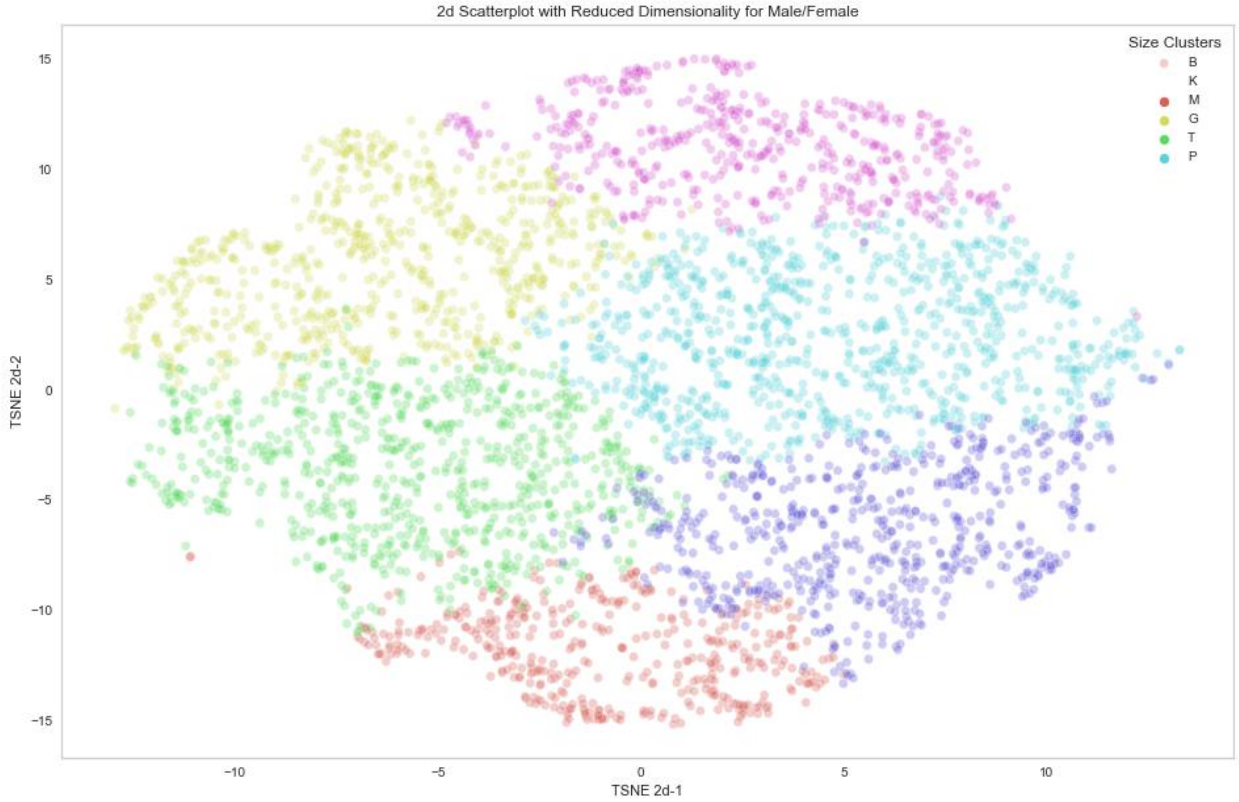
Feature Selection

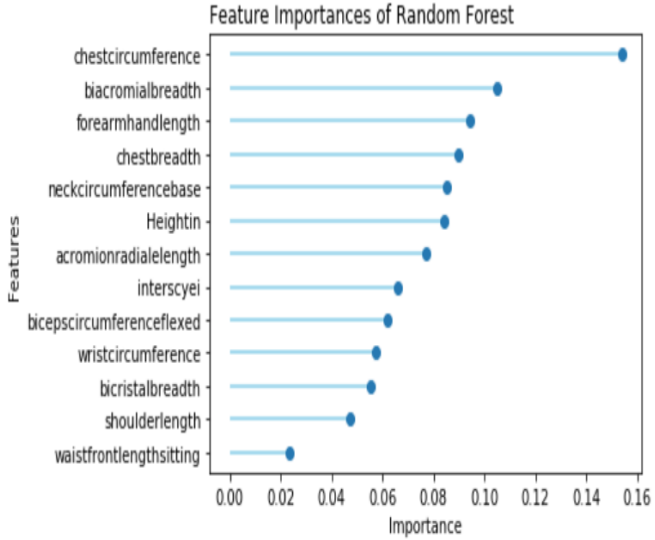
Selected 28 relevant measurements and filtered highly correlated ones

- Height
- Neck circumference base
- Shoulder length
- Biacromial breadth
- Interscye I
- Acromion radial length
- Forearm hand length
- Chest breadth
- Chest circumference
- Biceps circumference flexed
- Bicristal breadth
- Waist front length sitting
- Wrist circumference

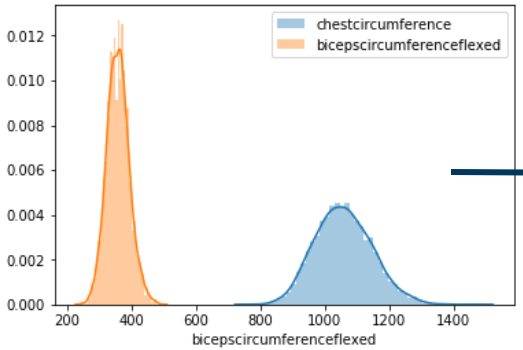


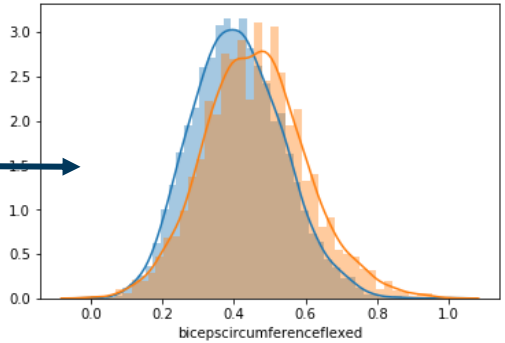
Clustering & Feature Importances

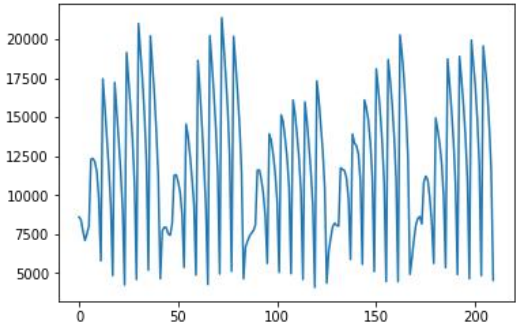


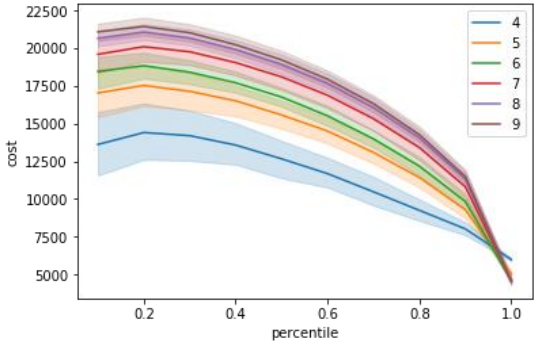


Optimization









Getting the optimal number of clusters & fits

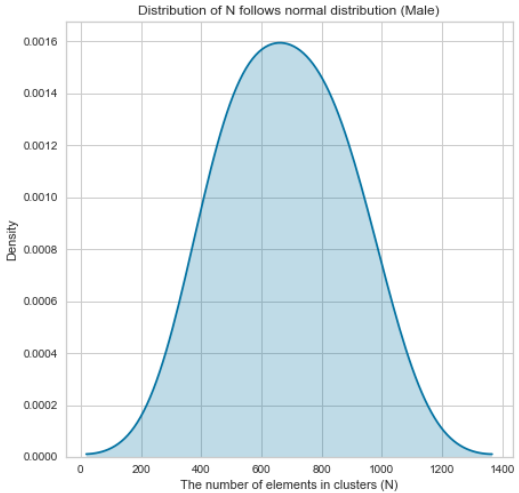
1. All the Relevant Fit measures are normalized
2. Each record is assigned to the nearest & larger fit
3. Cost function is defined by the difference in measure of the assigned fit and the measure of human across all the variables & penalized for increase in the number of sizes
4. Simulated using sub samples for different values of fits possible (10-90th percentile of the cluster distribution) & number of clusters

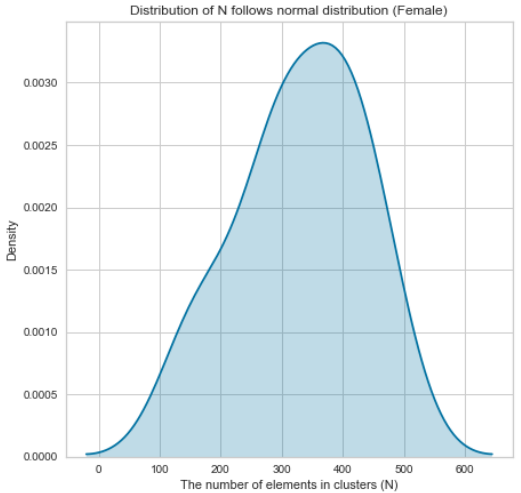
Mathematical model

If $X = [x_1, x_2, x_3, x_4, \dots, x_n]$ represents the list of the values of 'chestcircumference' in the cluster then,

$V_{index} = 0.9(N + 1)$ where N is the number of elements in the cluster.

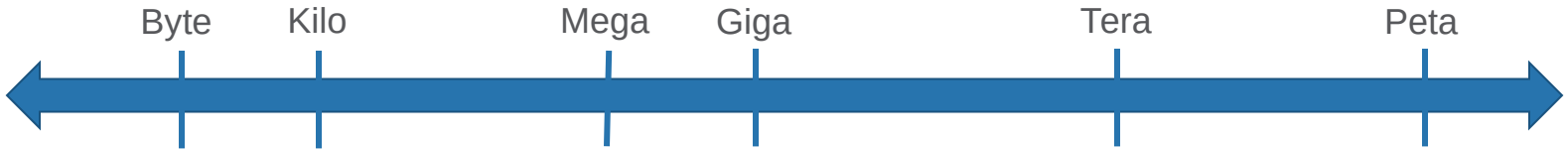
Value on super scale = $X[V_{index}]$





Results

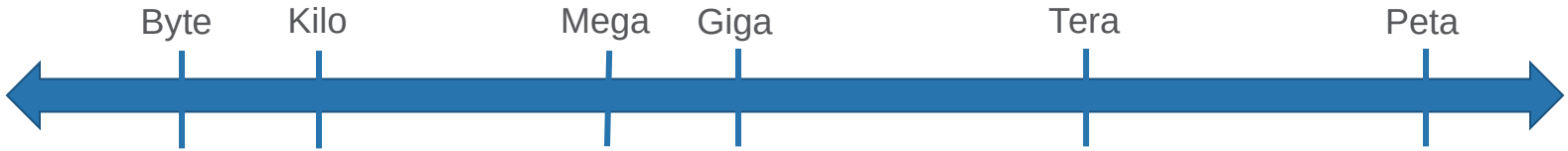
For the male t-shirt category 6 sizes in super scale are optimal



Super scale 1	Size in super scale	Primary Dimension	Values for primary dimension in mm
B	1	Chest circumference	1002
K	2	Chest circumference	1011
M	3	Chest circumference	1092
G	4	Chest circumference	1116
T	5	Chest circumference	1200
P	6	Chest circumference	1272

Results

For the female t-shirt category 6 sizes in super scale are optimal



Super scale 2	Size in super scale	Primary Dimension	Values for primary dimension in mm
B	1	Chest circumference	900
K	2	Chest circumference	912
M	3	Chest circumference	992
G	4	Chest circumference	1004
T	5	Chest circumference	1089
P	6	Chest circumference	1160

Thank You