converge

@ Walmart

CRAZY CODERS

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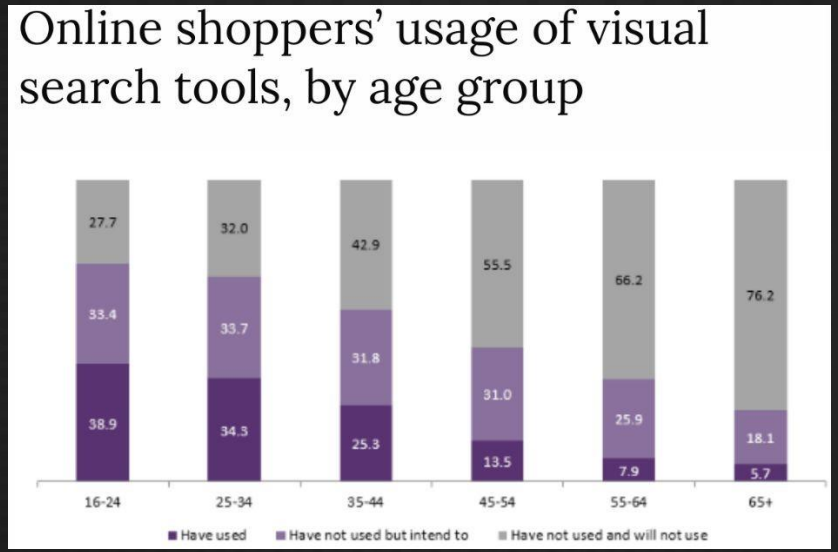
PROBLEM

(THEME DATA)

DISCOVERY & SEARCH

Using Visual AI technology to make ecommerce more seamless, personalized, engaging more easier and flexible , allowing customer to search any buyable product by just capturing picture from mobile or directly choosing the product from video frame of OTT and video platform.

SCOPE OF INNOVATION & IT'S CUSTOMERS (a &b)



As per Clark Boyd survey more and more young customers are getting habitual for visual search for ecommerce which is current customers and will be customers of amazon in future also

OUR CUSTOMERS : millennials and youth who are more techies and are now always follows visual searches , age 20-35 have biggest attraction towards visual search

9%

Estimated compound annual growth rate (CAGR)

$14.7 B

Estimated value of visual search by 2025 end

85%

Of consumers value visual information over text for fashion /furniture online surface

62%

Of millennials want visual search over any other new technology

SOURCE : IndustryARC | Visenze | The Intent Lab

Solution Architecture

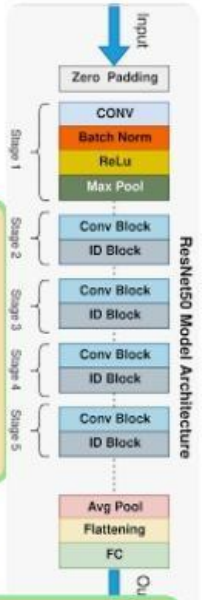
USER / CLIENT

Capture or browse product image via MOBILE

PREPROCESSING1 of frame from video when user clicked shop now, blurring & filter removed **OBJECT DETECTION BY YOLO MODEL** will give cropouts of buyable products

When user click image of product he is allowed to crop image so that he can exactly give a proper image prompt for search

PREPROCESSING2 for enhancing clarity of choosen product by deblurring model . **feature map creation** of image by using advance DL model architecture like RESNET50 (have error % <3%)



YOLO will give cropouts of image so that no information is lost of individual product ,now this cropouts will be shown on side bar to user , she/he will select the one product which actually excited him to SHOP , let say mobile , so now the further process will be done only on that product (mobile)

OUTPUT : FEATURE MAP of the image + METADATA for product like CATEGORY : mobile TEXT : samsung COLOR : black

as input for search in DB

SERVER

we have extracted the products from ecommerce website with there links , images and brand information, .
for demo purpose 100 categories * 1000 products = 100000 product's information

training with this data, using RESNET model and creating feature map for each product and storing the feature map linked with its amazon link and brand informatiion in MONGODB database

DATABASE

{ "_id": ObjectId("unique_id_1"),
"category": "mobile",
"map": [0.3, 0.4, ..., 0.9],
"text": "Samsung fold",
"color" : black}
{ "_id": ObjectId("unique_id_2"),
"category": "Curtains",
"map": [0.7, 0.5, ..., 0.6],
"text": "ikea"
"color" : black }

redirect to amazon link

OPTIMIZED SEARCH : first metadata like category and text (brand name) will be used and then feature maps will be matched to give best results

Depth of Server Side &Search Algorithm

Input from client/user after applying **YOLO MODEL and then resnet model** sending feature map that ables to give category text approx color via feature map

SEARCHING IN DB , using **BOOSTING / WEGHTING** Approach for efficient search

FOR SEARCH (for demo) weightage is in this order **category > text > color** then search will work like this

SEARCHING ALGO

INPUT from feature map
category : smartPhones
text : redmi
color: blue
feature: [0.44, 0.33....0.68]

smartPhones
Electronics
Comfort

Apple
Samsung
Redmi
Lg
sofa
ikea
pillow

RED
Blue

OUTPUT matching feature map , match with highest probability is given as result and other with lower prob are given as recommendations

REDIRECTING TO BROWSER OR APP AMAZON

STORING IN DATABASE

Millions of products images with there information like brand ,color, link etc

feature Extraction by resnet50 DL model (KERAS)

Category	Text	Color	Feature Map	Link
SmartPhones	samsung	black	[0.44 , 0.33 .....]	http://amazon1
SmartPhones	redmi	blue	[0.44 , 0.23 .....]	http://amazon1
Electronics	Lg	red	[0.34, 0.76 .....]	http://amazon1
comfort	sofa	grey	[0.89, 0.23 .....]	http://amazon1

IMPACTS OF SOLUTION (c)

IMPROVED CUSTOMER EXPERIENCE

A model that accurately identifies and suggests products enhances the shopping experience, making it easier and faster for customers to find what they need. This can lead to higher customer satisfaction and loyalty..

INCREASED SALES & CONVERSION RATES

Efficient product discovery through accurate image recognition can lead to higher conversion rates as customers are more likely to find and purchase products quickly.

REDUCED RETURN RATES

Accurate product identification can reduce mismatches and incorrect orders, leading to fewer returns and exchanges, which can save costs and improve customer trust.

COMPETITIVE ADVANTAGE (NEED OF HOUR)

Advanced image recognition capabilities can differentiate an e-commerce platform from its competitors, attracting more customers and increasing market share.

SUCCESS METRICS OF SOLUTION (c)

In our solution approach we are using advance deep learning models like yolo v50 , resnet50 well this model have been trained on millions of images but we have to tweak some parameters of the model so that it can work in most efficient way for our case that is for ecommerce image search , other important point to consider is searching the solution must be able to handle a lot of traffic as the customer base for the case is very big , **following metrics will help to measure the success of our solution .**

- ACCURACY
- PRECISION & RECALL
- MEAN AVG PRECISION
- TOP K ACCURACY
- F1 SCORE
- CUSTOMER SATISFACTION

SCALABILITY &MARKETPLACE EXPANSION (d)

Cloud Integration

For demo we will be using extracted 10000 images. For scaling we can utilize cloud platforms (AWS) to scale compute resources up or down based on demand.

Automated Pipelines

Establish continuous integration and continuous deployment pipelines for seamless updates and model improvements.

Data Management

Implement data lakes for centralized, scalable storage of structured and unstructured data.

Data Augmentation

Applying automated data augmentation techniques to continuously expand and diversify training datasets.

MARKETPLACE :

SELLING APIS: Once amazon gets peak at providing the visual product search facility the apis for searching can be made available with monetization .

SHOPPING RECOMMENDATION BY WATCH HISTORY : we can personalize recommendation by providing user ads of the buyable products in last movie she/he watched

Thanks!

TEAM : CRAZY CODERS

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