



จุฬาลงกรณ์มหาวิทยาลัย  
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# Automated Ad Creative Generation

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# Motivation

❑ Ad creatives are ads served to users on a webpage, app, or other digital environments

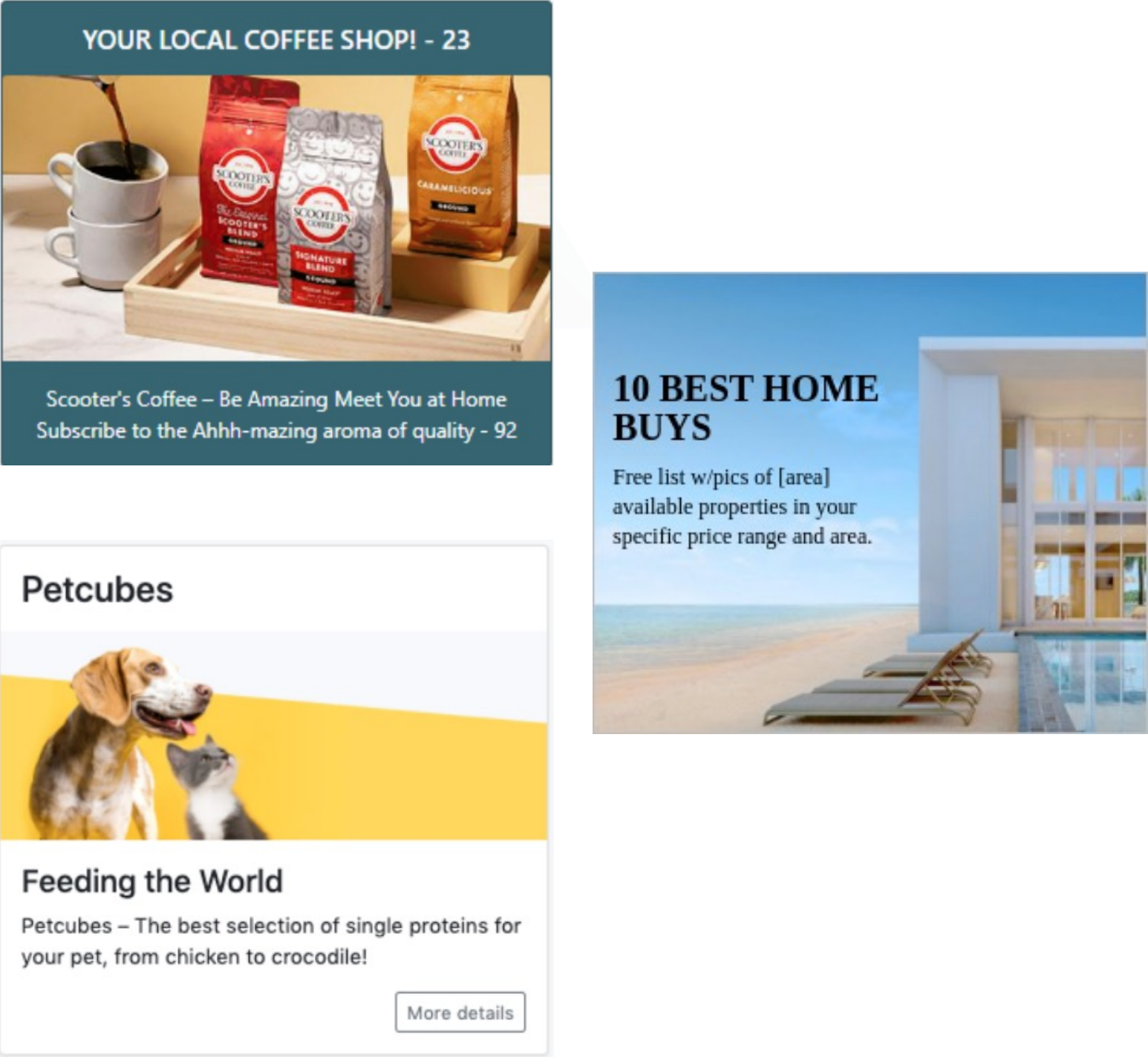
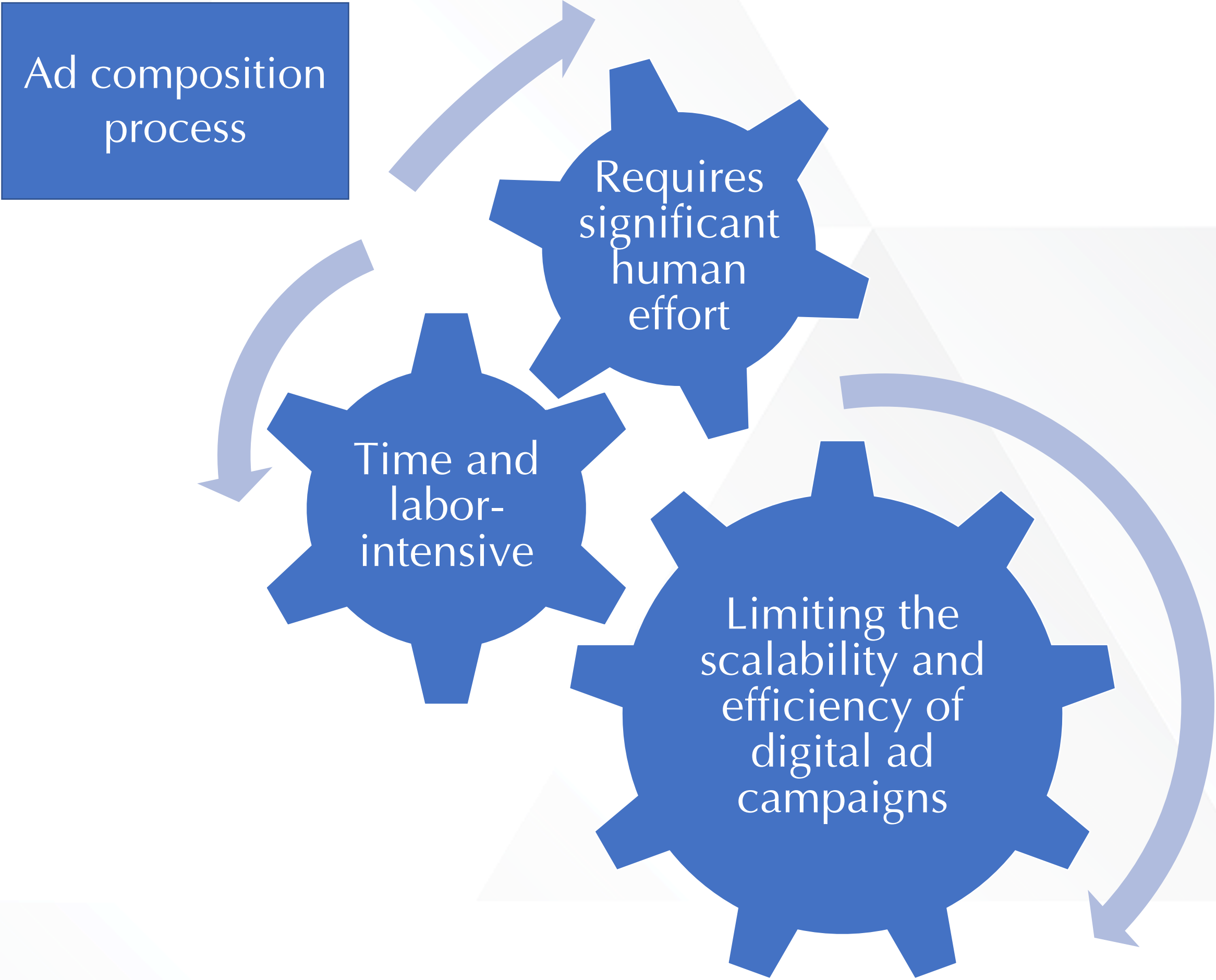


Figure 1 : Sample ad creatives





# Motivation

- ❑ This work introduces **AUTOCREATIVE**, a novel system to automatically generate ad creatives
- ❑ It combines -
  - ❑ Ad copy generation using a sequence-to-sequence Transformer model
  - ❑ Ad image selection using object/scene detection and aesthetic appeal scoring

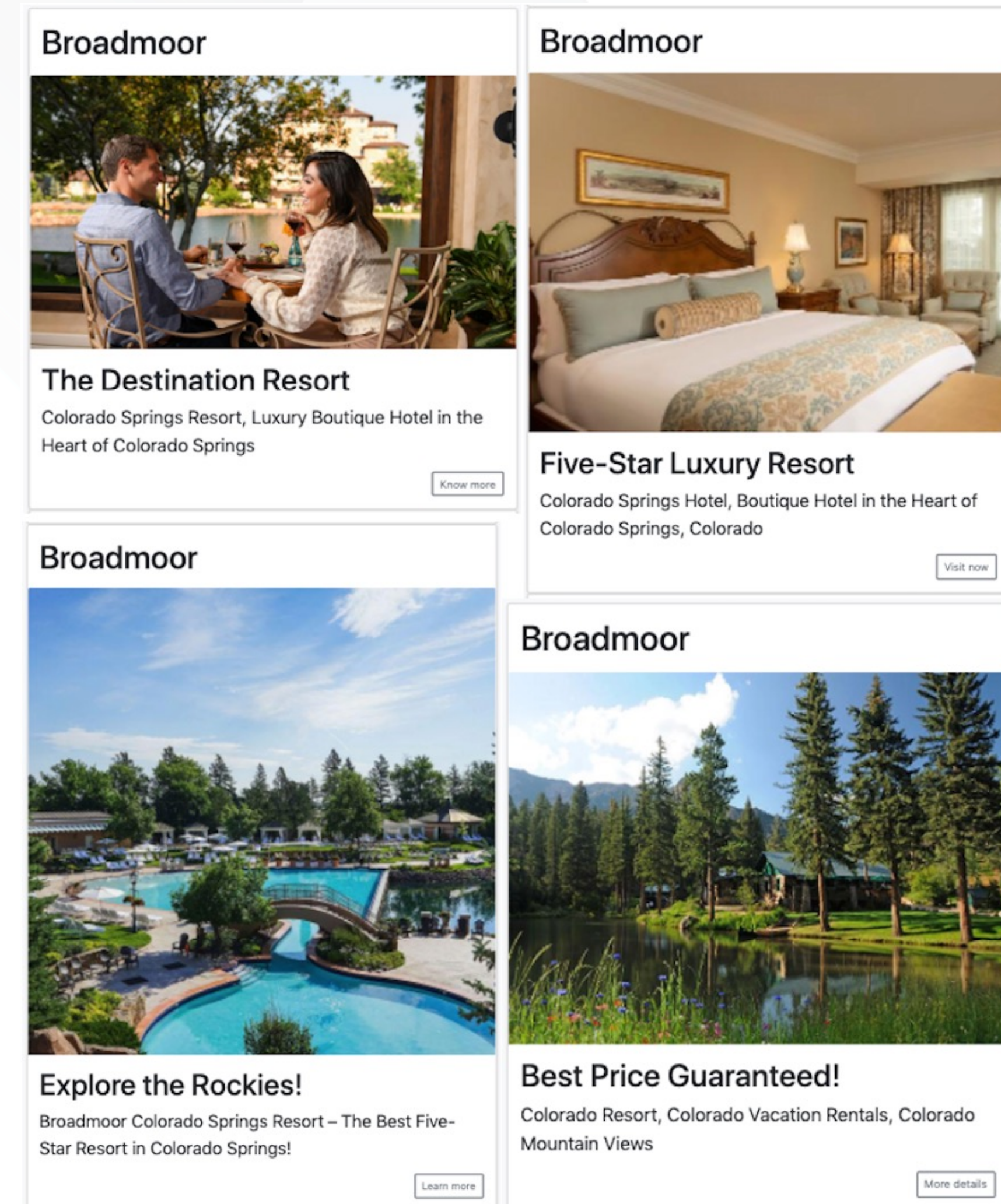


Figure 2: Examples ad creatives generated for the URL - <https://www.broadmoor.com/>



# System Overview

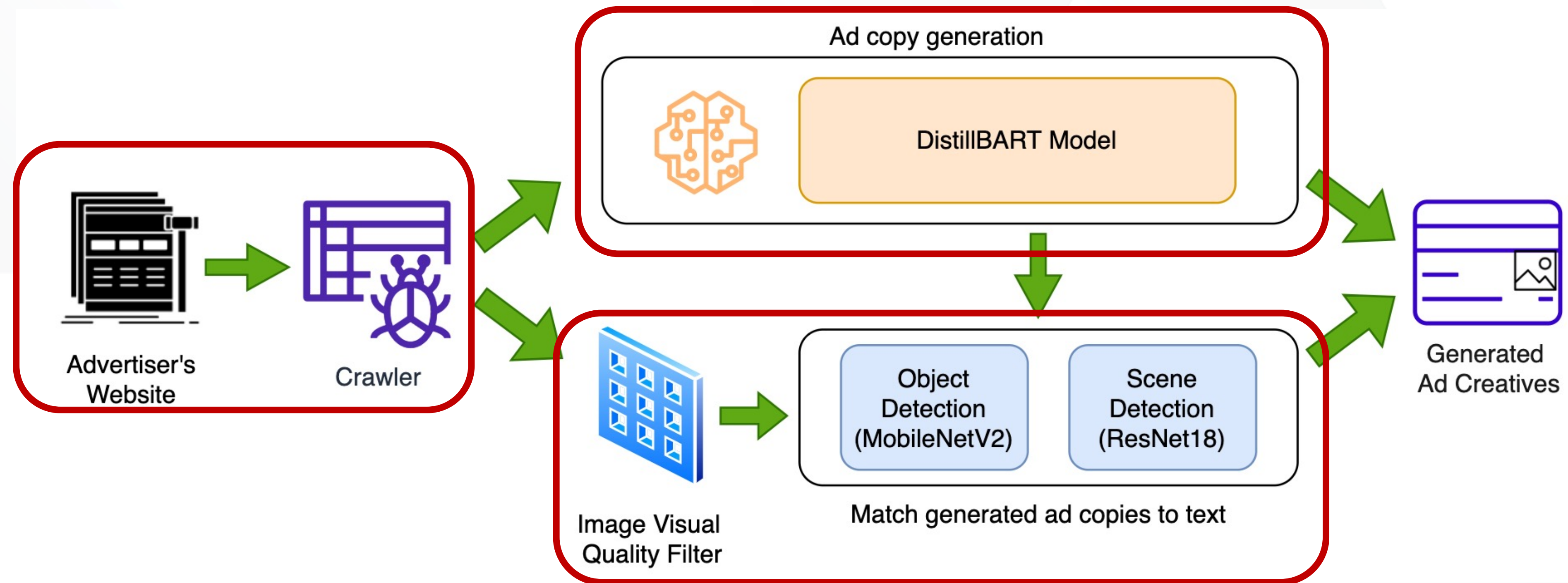


Figure 3 : Overview of **AUTOCREATIVE**

# System Overview

## 1. Ad Copy Generation

- ❑ We used **DistilBART** model\* and fine-tuned it on a proprietary dataset of 300k (company description, advertising message) pairs (**Jin et al., In press**)
- ❑ Bucket the training data based on the ad message length
- ❑ Fine-grained length control using conditional training
- ❑ Use POS tags as an additional control code to generate syntactically diverse messages

POS tags	Length control (shorter headlines)	Length control (longer headlines)
JJ	Best Coffee Shop	Best Arabica Coffee Products & Services in the USA
VB	Buy Coffee Online	Buy Coffee Online – ABC's Coffee Co.
DT	The ABC Coffee Facts	The ABC Coffee – Where the best is made
PR	We're in the Coffee Business	Your Source for Arabica Coffee Products and Accessories

\* <https://huggingface.co/sshleifer/distilbart-cnn-6-6>



# System Overview

## Step 2: Image Selection

- ❑ Filter out noisy images like social media icons, background, or footer images
- ❑ Measure the images' visual appeal based on factors like image colorfulness, contrast ratio, and lighting
- ❑ Match generated headlines to the objects and scenes in the images using cosine similarity
- ❑ Object detection - **MobileNet V2 (Sandler et al., 2018)** model trained on Open Images Dataset V4
- ❑ Scene detection - **ResNet-18 model** trained on Places-365 Dataset (**Zhou et al., 2017**)

Ad headline	Buy Italian Food Online!	
Crawled Images		
Objects detected	Clothing Man Table Woman	Pasta Food
Scenes detected	Dining Hall Cafeteria	Pizzeria
Cosine similarity	0.5172	0.6971
Selected image		

Figure 4: Matching image to a given ad headline

NTV ADS

Expired

Action ▾

 Native Content Ads


## Design


Destination URL \*

Custom Advertiser Name

0/25

Select how you want to design your ad

 Manual Input

 AI-Generated

Headline \*

0/25

☐ Use long headline

## Preview


No preview available yet

Add text to generate preview.



# Some more examples

Chatrium




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Know more

Chatrium




Best Hotels Bangkok Thailand

Boutique Hotels & Residences in Bangkok Thailand, Chanthaburi Thailand

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More details

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URL – <https://www.chatrium.com>

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More details

URL – <https://www.roquette.com/plant-protein/applications>

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Scooters Coffee – The Best Malted Mocha Latte & Add Cold Foam to

Know more

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Best Coffee Shop

Shop our 100% Arabica coffee products. Find your nearest location.

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We're in the Coffee Business

Scooter's Java Express – The best coffee shop in the world!

Book now

Scooters Coffee



The Scooter's Coffee Facts

Scooter's Coffee – The Scooter's Coffee, the best coffee in Bellev

More details

URL – <https://www.scooterscoffee.com/>



# Conclusion

- ❑ We deployed **AUTOCREATIVE** to production in March 2022 and integrated it to Knorex XPO\*, a self-serve cloud marketing automation platform
- ❑ Positive feedback received from internal account team and various clients
- ❑ Helped small advertisers who cannot afford internal creative design team

\* <https://www.knorex.com>

## THANK YOU !