

Multimodal Neural Language Models: Supplementary material

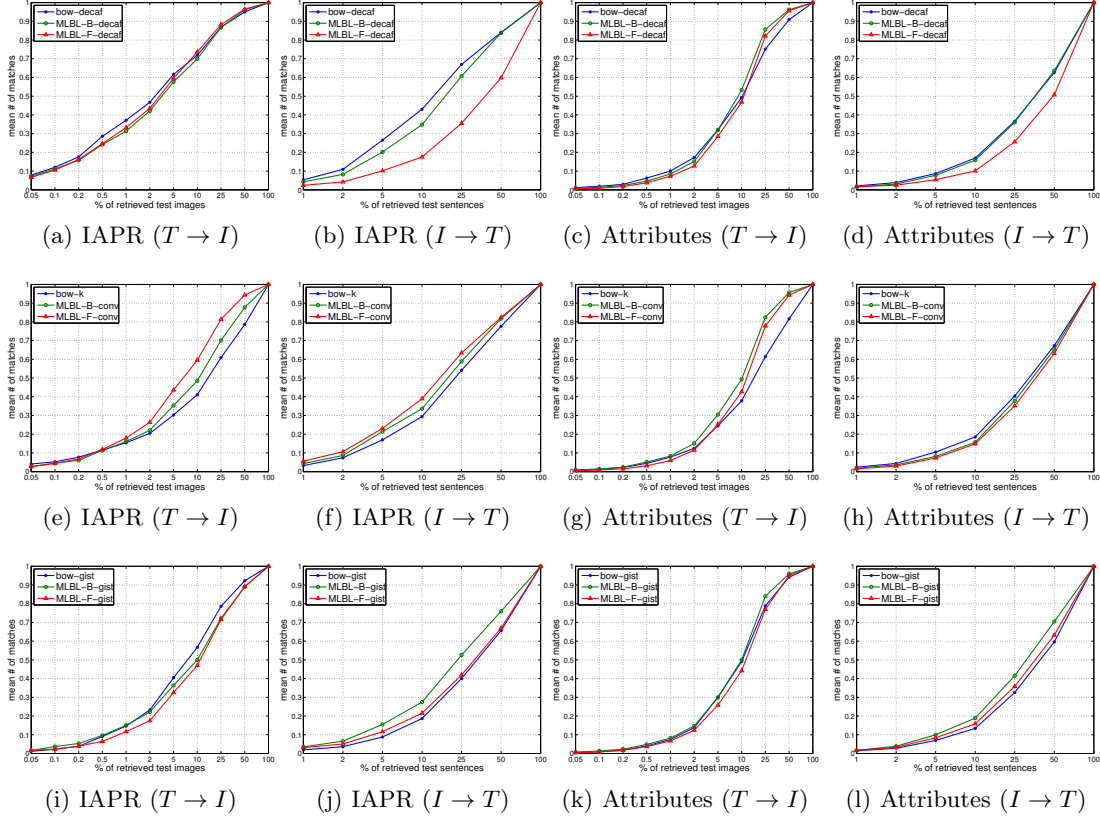


Figure 1. Retrieval results on IAPR TC-12 and the Attributes dataset when using text to retrieve images ($T \rightarrow I$, left) and images to retrieve text ($I \rightarrow T$, right). bow-k refers to k -means feature maps (the inputs used to our convolutional models). Retrieving descriptions from image queries use a shortlist size of 100. For the Attributes dataset, we used a random subset of 5000 test images.



'the sun is setting in an orange sky with grey clouds over a black landscape ;'



'a man is dancing on a stage with a woman ; a man is playing on a piano behind them ; spectators sitting on a balcony in the background ;'



'a tourist is distributing tangerines to the children that are sitting around a round table in a classroom ;'



'a man wearing a yellow cap , a white tee - shirt and grey jeans is holding a bicycle ; two other team members , both wearing white tee - shirts and black shorts , are standing behind a van with an open boot and massaging another person lying in the van ;'



'an aerials athlete is jumping a summersault over a freestyle jump ; a steep landing hill surrounded by a blue fence in the foreground ; the judges ' tower , a dark forest and grey clouds in the background ;'



'women in blue basketball uniforms and a person in a blue vulture costume are standing around a man with a black tee - shirt in a sports hall with a brown floor and yellow lines ;'



'a square at night with burning street lamps , palms , green spaces and colourful flowers ; yellow (or yellow - illuminated) multi - storey buildings behind it ;'



'two women wearing a red swimsuit / bikini in the brown waves of the sea ;'



'naturally stunning . these 14k gold mother - of - pearl drop earrings are the perfect pair .'



'this elegant , small flap travel clutch with a RARE leather wrist strap offers a secure way to keep your documents and other valuables close at hand . made from tumi ' s signature ballistic nylon with a locking leather flap , it features interior and ...'



'the ambra hobo is a chic top zip closure bag featuring cotton lining , two multi function pockets , and a zippered backwall pocket . available colors : saffron , black .'



'formal green silk neck tie : invited to a very formal holiday gala ? consider this gorgeous spruce green woven silk jacquard , named for illustrious boston pops conductor arthur fiedler .'



'cool and versatile , this stylish shoe is a must have this season . features a trendy high heel and a cute peep toe . clean lines and a platform front complete the look . available colors : dark multi / bark patent , black western leather , black kid suede / tumbled patent , graphite perfed liquid , new foil metallic leather / crack he ...'



'tackle your active days in the softspots tace sneaker . this shapely womens casual shoe has a supple leather and suede upper with overlay and stitching details for a dressier sneaker look . the leather lining absorbs moisture for a cool , breathable feel , as the adjustable straps allow a customizable fit and easy on - and - off ...'



'race down the road in the skechers speedsters - motoring sneaker . this sporty womens casual shoe has a durable leather upper and open mesh fabric panels for cool air circulation . a fabric lining lends smoothness , as the metallic overlays and perforated stripes add shine and ventilation . padding in the collar , tongue and fo ...'



'keep it gypsy " with justin gypsy cowgirl boots ! - popular bay apache leather upper - j - flex flexible comfort system cushion insole maximizes your energy return rate - removable orthotic insert the fun , functional justin gypsy cowgirl boot is not to be missed ! this popular boot features a distressed bay apache leather fo ...'

Figure 2. Sample description retrieval given an image. The top result is displayed.

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in this picture there is another large wooden bikes on a wooden square with a lot of palm) with a wall and a lookout in the foreground ; dark green trees and a white blanket ; two water , two boys and children are standing around a grey waterfalls and street in a garden



in this picture there is a large single wall with a brown and orange and orange tables in the background ; light grey clouds in the background ; a light brown wall on the right and on the left and dark green spaces and light brown , brown round railings - storey bed with many



in this picture there is another main note last to the entrance of them ; water and is looking a small wall ; a large white wall in the background ; two more boats on a brown river ; light brown stairs in the foreground ; grey clouds and a blue sky in the background



in this picture there is a separate ye towards ; a man on a green hard court in a stadium with a rugby in a stove ; a woman with a dark orange football runners ; two men writing buildings on a rugby field with a advertising fence on the ground head stages and women



in this picture there is a snow covered summits in the background , and a bush with a brown and brown doors and a large , light brown building with snow made of grey and blue and a spare jump and a blue sky in the background ; the entrance ; many people on a



in this picture there is a glass field on a palms and grey cliff in the foreground ; cars on a grey road in the background ; more spectators on a meadow in the middle of a desert fence ; people on slopes on the bank in the background ; a curve on the left



in this picture there is a coco boardwalk in the foreground , a blue sky with fleecy clouds in the background ; illuminated buildings behind it ; many people , and three - storey buildings with dark blue domes and houses with greyish - brown cranes in the foreground , a mountain facade of it



in this picture there is crawling on a wooden gravel ; danish branches above grey stones and taking pipes through a dense jungle vegetation ; there are palms and trees and people at the top of people is standing on a meadow , a square with palm trees , palms and rocks and NUM trees



this product contains a size , orate sex appeal that on hand . ideal moms with a slip - on slide . pull on front addition inside and outside zips close , this one features closed . full magnetic zipper closure inner entry with logo cargo approx shoulder . NUM " . strap drop .



this product contains a peep - toe atop a covered stiletto heel featuring NUM , round platform and a foxy stiletto heel in NUM NUM / NUM " circumference upper : NUM NUM / NUM " front platform rise . this vampy inside satin upper , a peep - toe sandal from heel that



this product contains a push - one back of securely in place . in two brilliant cut . square brilliant cut diamonds (NUM / NUM ct . tw .) diamonds weigh approximately NUM . NUM genuine princess cut diamond stud earrings set in pure sterling silver . standard french top board post back



this product contains a NUM full ... boot allows you wearing this boot from kelsi full grain leather with suede tanned leather and a moisture - enhancing comfort ... wow company permanent medium ... boots are sheepskin ... designed to be comfortable and stylish break . we ' ll feel and wearable circa cole



this product contains a fast next in magazines such as lucky wilson complementing stripes add rich color for refined men ' s narrow silk tie . talk about a , red , opaque and selleria slim ties at NUM . g diameter and is the perfect for the possible flair of striped silk twill



this product contains a high cluster of sterling silver dangle earrings don ' t strap is the pair of cultured freshwater gold hoops . two white pearl petals ' re clicktop backs . using pierced backs . item may NUM . NUM . NUM . NUM . 5mm pearl hoop earrings ... is



this product contains a credit card and cell phone or eurowire stash pockets keep you organized . and wide cake makes an effortlessly around the gym , taking the town ships with a slip plaque on your bag . roomy enough to keep your key , and open tiers with rhinestones ha on hobo



this product contains a size embedded to form to give your look with dashing and touches to meet them . lite value including a silk jacquard . the perfect knot at our ties match dressing build . shipping , this stock will fall whenever you customize into wearing to wear . consider the prada

Figure 3. Sample sentence generation.

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two bunk beds made of wood with multicoloured bedcover ; there is a blue cupboard between them ; in the background on the right there is a window with blue curtains ;



a round fountain with grey cobblestones and a whale fin in the middle of a red square with park benches , a lawn , a brown house , cars on a car park , many high trees , a black bird in



twice the intrigue radiates from these flirty hoop earrings . hoops of 14k yellow ribbed gold shape the perky pair .



washington RARE tie - nostalgia design . talk about a great tie , this mlb tie shows off your favorite team in a colorful and stylish way . these ties are NUM % silk .



view (from above) of the trees , houses and streets of a city with high - rise buildings and a skyscraper in the foreground and grey clouds in the sky in the background ;



people are sitting and standing on a light brown boat made of reed on a dark blue lake ; brown rocks and a grey sky in the distant background ;



these high heels will shine at any dressy occasion . the strappy and open toed will allow your toes to feel cool and airy . available colors : silver reptile print , white satin .



enchant in european style with the elvira RARE boot from rieber antistress . this luxurious boot has a full grain leather and suede upper with buckle detail for a riding - inspired look . a padded footbed lends additional cushioning , while the side zipper allows easy on - and - off . the lightweight synthetic sole flexes with ev ...



a square and a street with burning street lamps and an illuminated cathedral with two towers at night ;



cricket players and two umpires on a field ; spectators on a grandstand under construction with three high red cranes behind it ; trees and a blue sky with white clouds in the background ; in the background ;



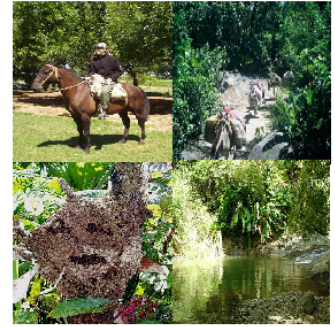
every woman deserves a pair of diamond stud earrings . brilliant NUM . NUM carat round - cut diamonds are set in four prongs to perfection in 14k white gold . each earring comes with a post and screw back closures for extra security .



the prada br1594 leather shoulder bag is a popular fashionable handbag made out of soft calfskin leather with a rich finish . this a beautiful latest design large shoulder which will make you look like million dollars .



many people are riding on brown horses on a trail in a forest with many trees in the background ;



a boy with grey trousers , a black jacket , a white helmet , ski goggles and blue skis is kneeling in the snow ;



the zippurse backpack is great as a computer bag (fits a laptop) , school bag , diaper bag or a beach bag . this bag can be used for almost anything . you can carry it as a backpack or a tote , just re - adjust the straps ! . available colors : black , crimson , moss , walnut .



the jessica simpson RARE hobo bag is a slink around town carrying bag . this fashionable jessica simpson hobo is made of synthetic leather . it holds your wallet sunglasses personal technology and a small umbrella .



Figure 4. Sample image retrieval given descriptions. The top 4 results are displayed.

tap into smooth , comfortable style with the skechers sassies - primeval shoe . this women ' s casual sneaker features a matte or metallic washed leather upper with suede overlays at the toe , sides and heel . the padded collar and tongue lend extra comfort , while the shock - absorbing midsole enhances support . the traction outsole ...



four female double players on a green hard court in a crowded open - air stadium ; a woman in the background (martinez) is serving , a woman in the foreground (kournikova) retrieving ;



a distinctly different casual look is yours with the alegria paloma mary jane . the leather upper of this women ' s clog has stitching detail and a strap and button detail for a fun look you ' ll love . a roomy toe box provides ample room to move your toes . the leather - covered latex and memory foam footbed lends cushioned comf ...



tourists are sitting at a long table with beer bottles on it in a rather dark restaurant and are raising their bierglaeser ;



a classic silhouette with all of today ' s features , a great handbag by day and evening clutch by night . bold hardware and zipper pulls make this bag a signature item in our international collection . under the flap you will find a hidden zipper pocket and in the main compartment NUM credit card slots , lipstick holder and add ...



view of a courtyard through a fence with lawns and trees , behind it a two - storey white building with many columns and arches ; there is a yellow church in the background ;



gucci ties for men silk neck ties (narrow) RARE main colors : grey , RARE : NUM x NUM . NUM magnificent gucci quality & a brand new NUM style , NUM % silk . luxurious & authentic designer ties at affordable prices . retail value of \$ NUM . NUM . made in italy . comes with gucci bag & gift box .



a sunset over the shore of a lake ;



Figure 5. Sample image retrieval given descriptions. The top 4 results are displayed.