



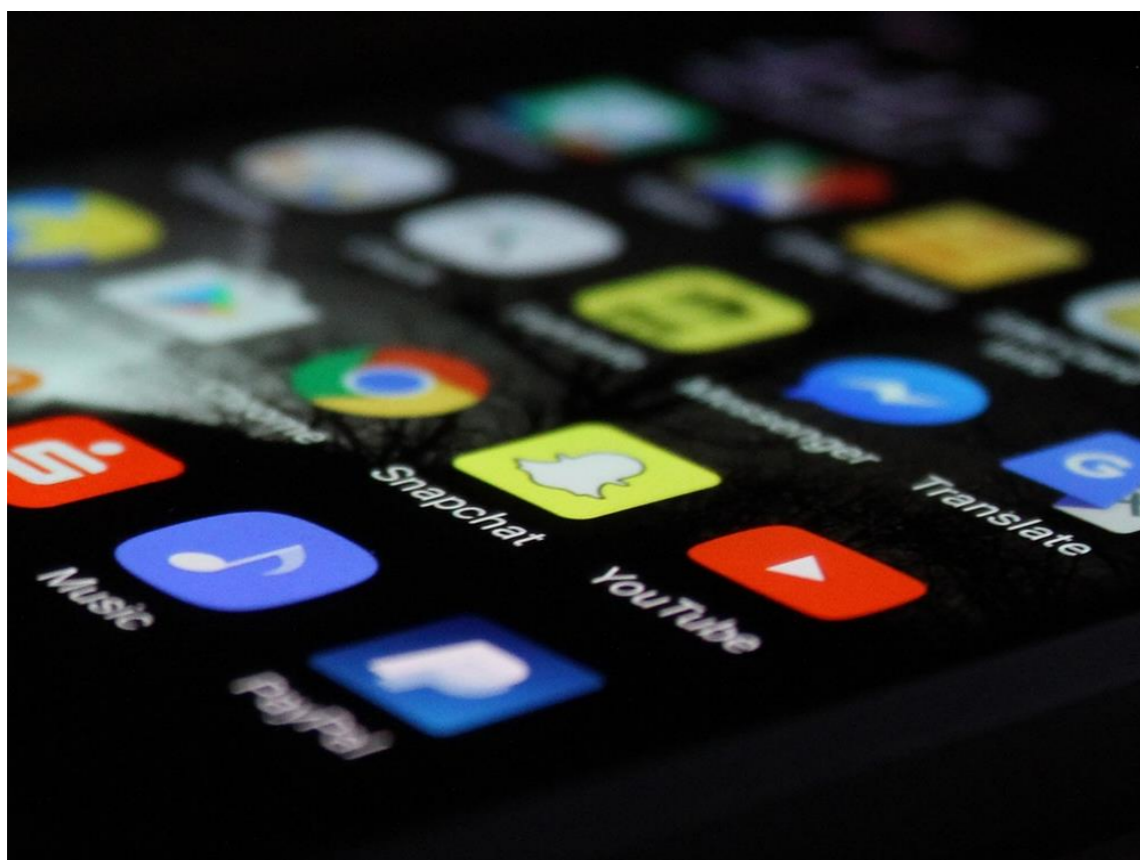
НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ
УНИВЕРСИТЕТ

Извлечение предпочтений пользователя по его фотоальбому на основе методов автоматического порождения описаний изображений

Харчевникова Ангелина Сергеевна

Нижний Новгород, 2019

Предметная область

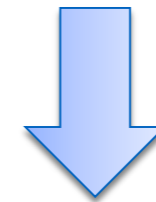


Данные о пользователях смартфонов могут применяться в качестве основной информации для создания различных рекомендательных систем

Основная идея



man with two dogs on beach
black and white dog jumps to get the
frisbee
dog runs on the green grass near
wooden fence

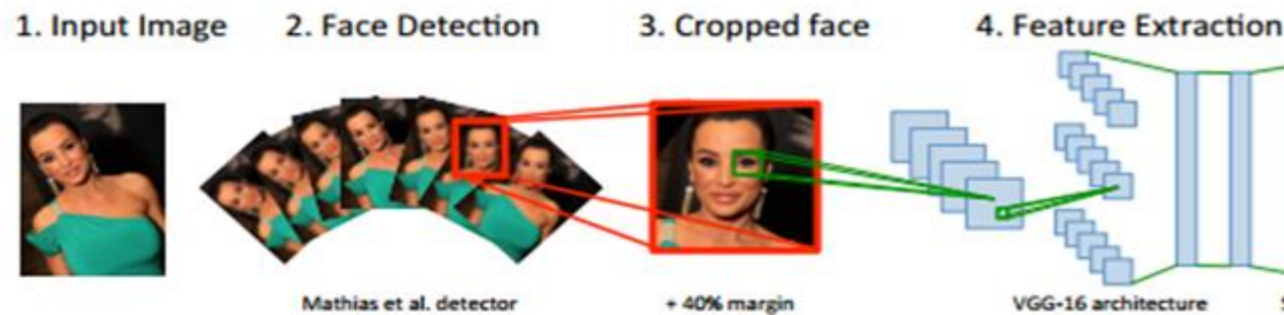
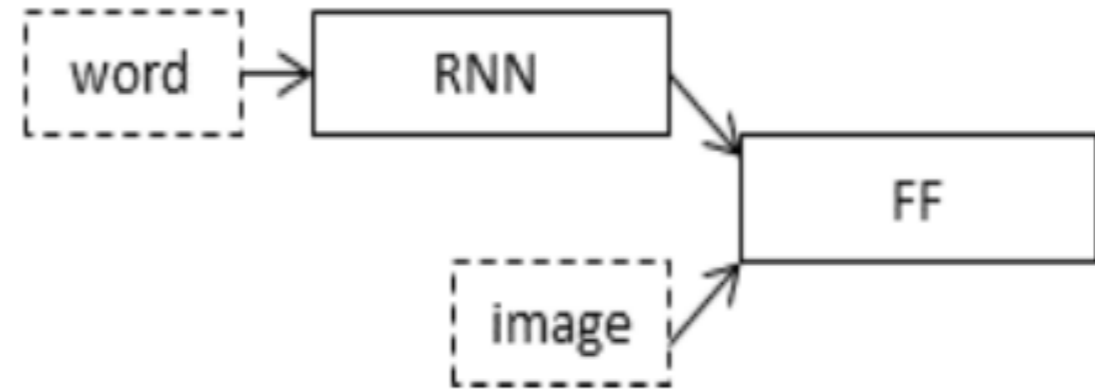


DOGS

Вместо прямого анализа изображений конвертировать их в текст. Выделение предпочтений на основе полученного текста

Image captioning. Train

“Merge” architecture. *Marc Tanti, et al: Where to put the Image in an Image Caption Generator, 2017*



VGG-16 pretrained on ImageNet

Trained on Flickr8K_Dataset

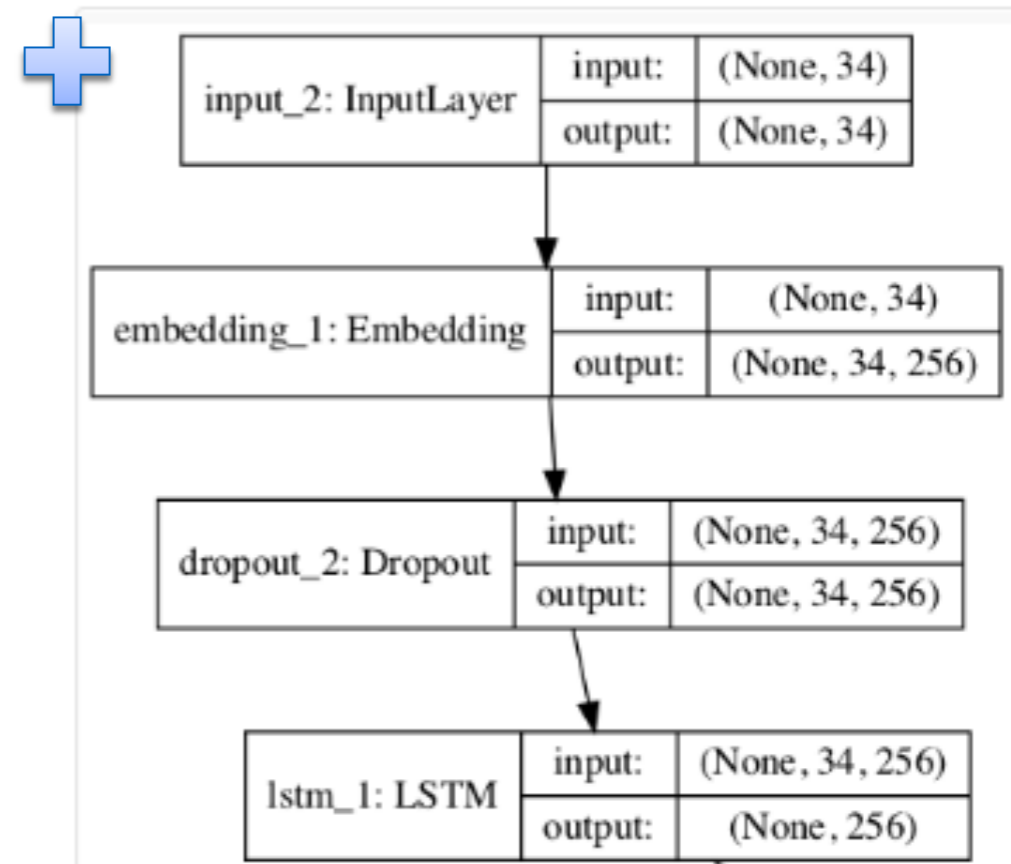
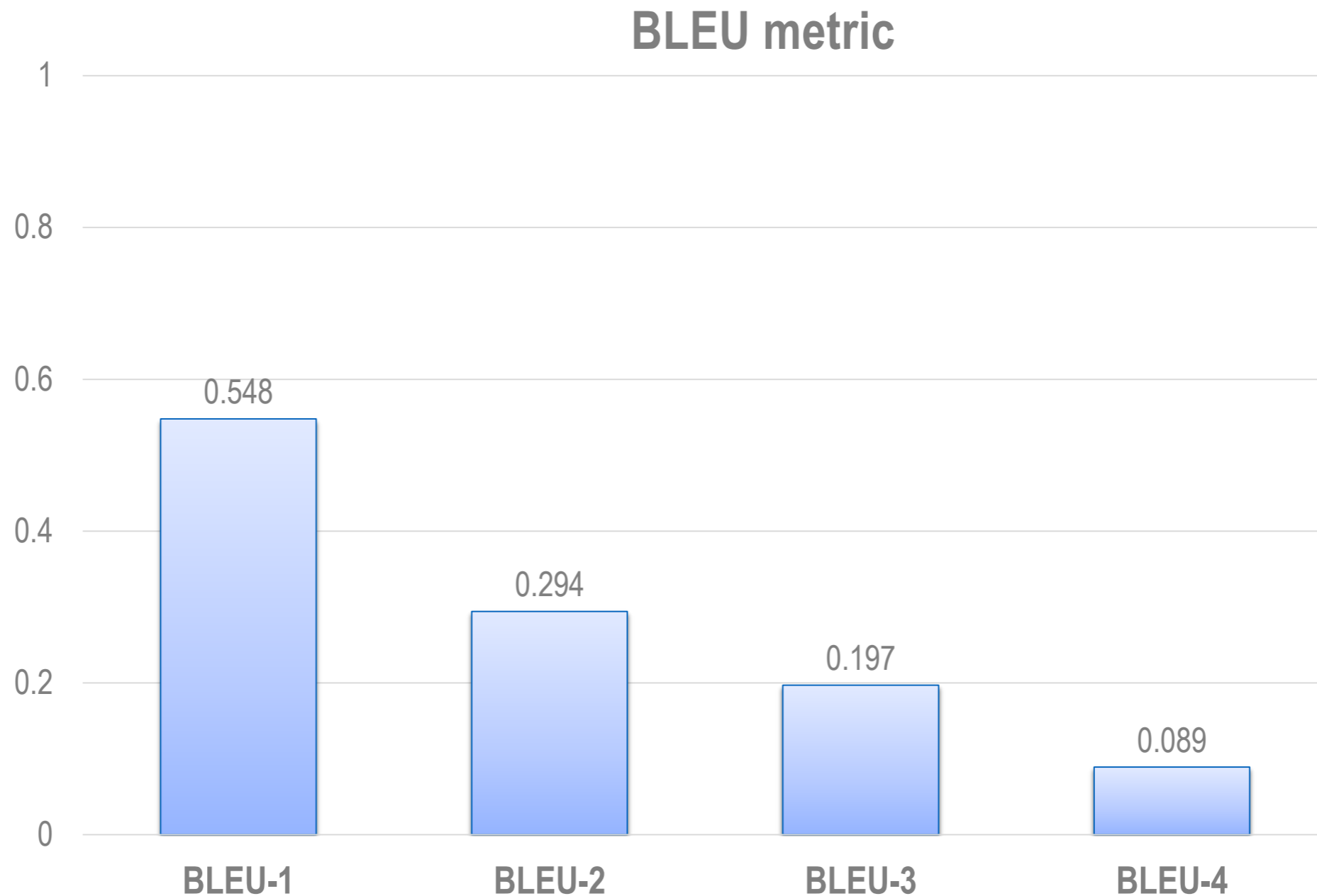


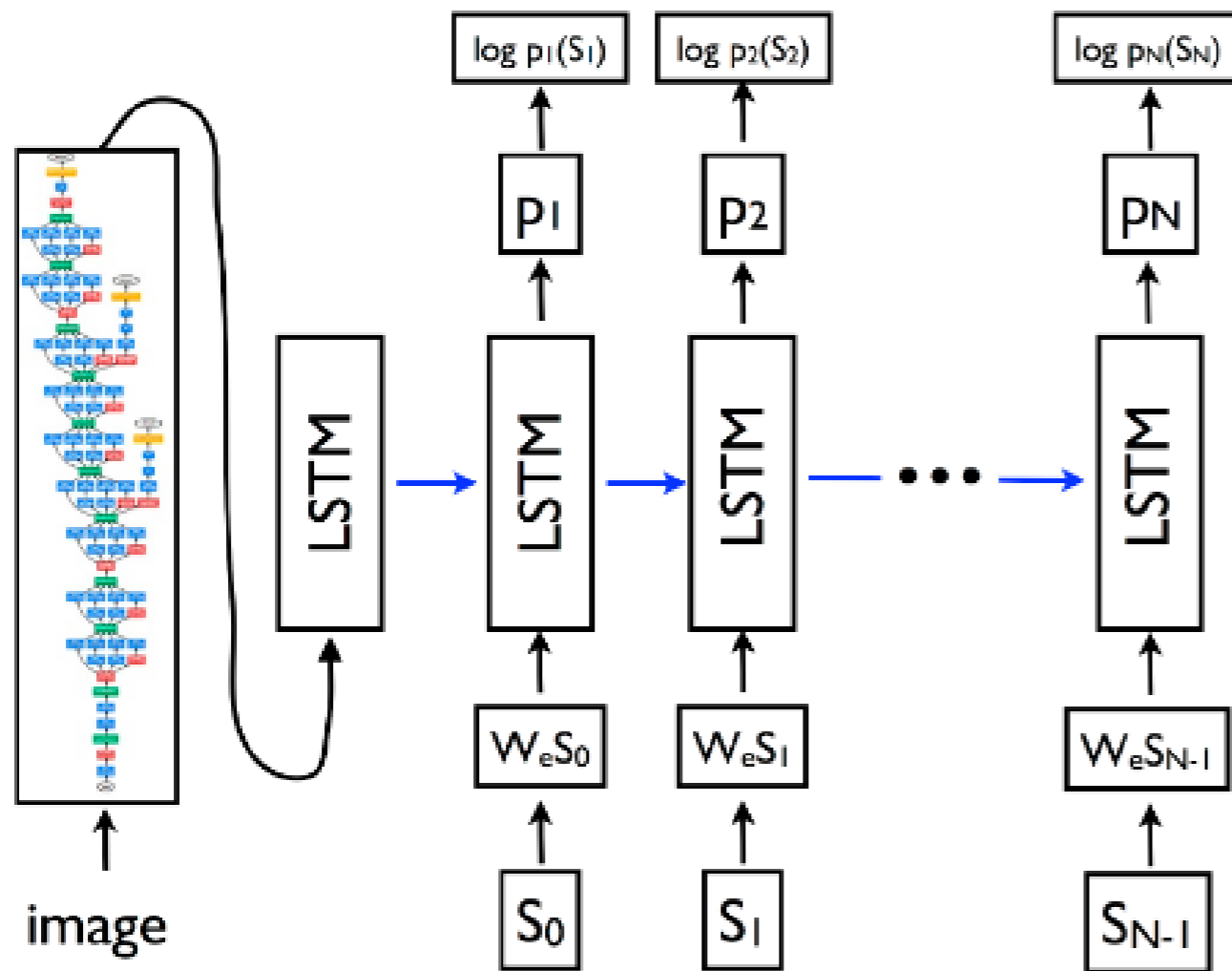


Image captioning. Evaluation

Flickr8K_Dataset: test set



Show and Tell model



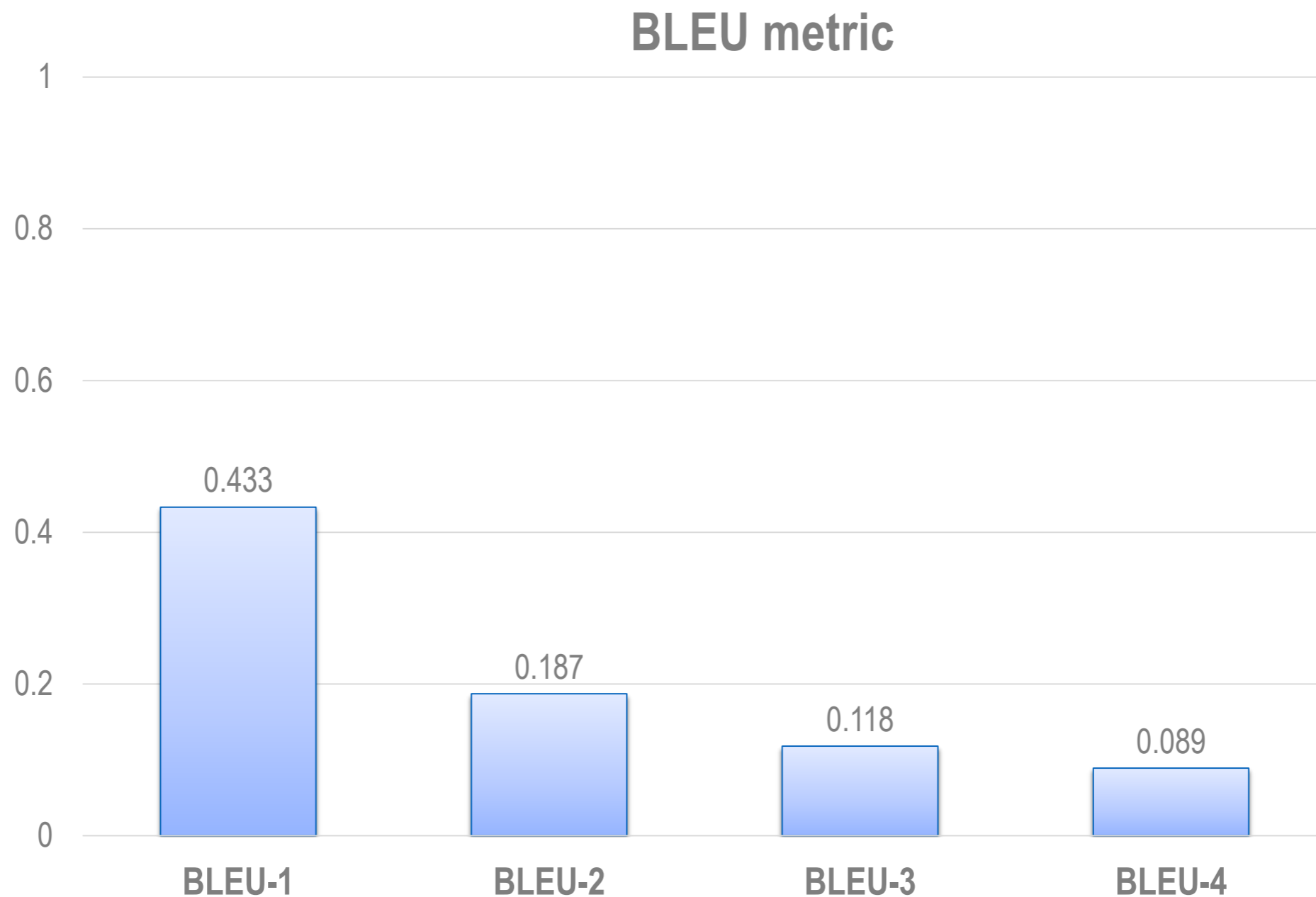
Show and Tell: Lessons learned from the 2015 MSCOCO Image Captioning Challenge.

Trained on MSCOCO Dataset



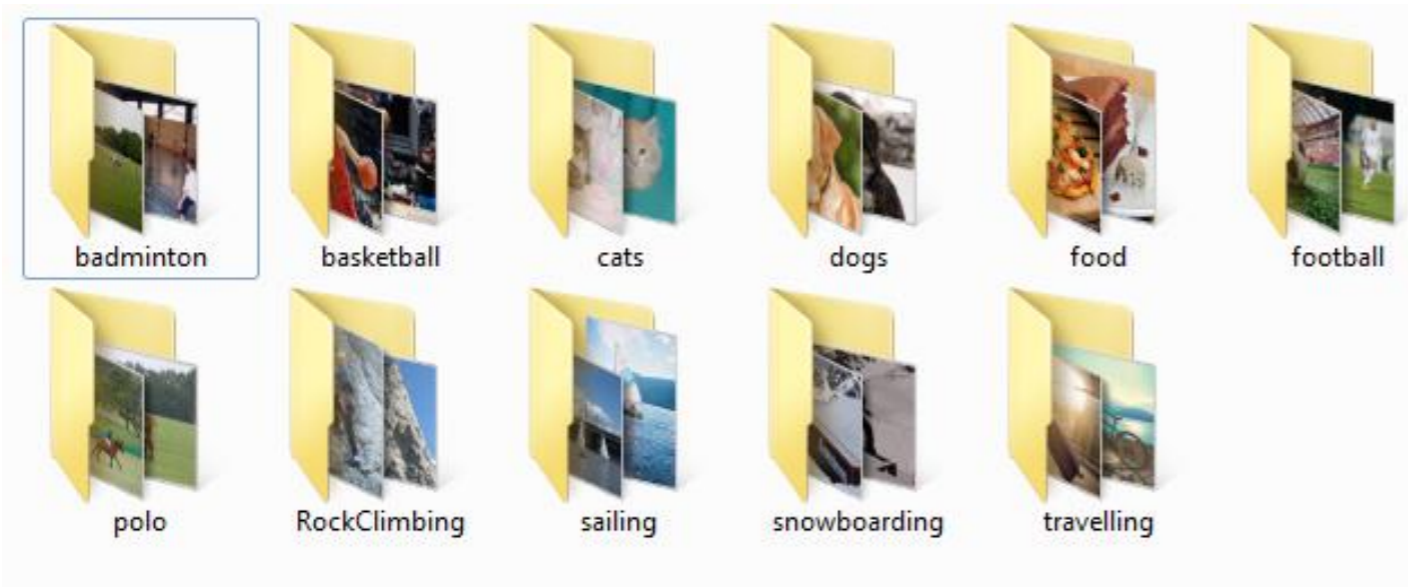
Image captioning. Evaluation

Flickr8K_Dataset: test set





Preferences modeling



User Profile

Flickr8K model

- startseq man is standing on rock formation
endseq



ShowAndTell model + Beam Search

- a man riding skis down a snow covered slope
- a man riding a snowboard down a snow covered slope
- a man riding a snowboard on top of a snow covered slope



Preferences modeling. Key words count

- Text cleaning
- Stop words removing
- Lemmatization

True Topic	Flickr8K model	ShowAndTell model + Beam Search
badminton	play 148 soccer 119	tennis 544 group 386
basketball	play 3 soccer 3	group 9 play 9
cats	dog 203 grass 192	cat 955 sit 492
dogs	dog 372 grass 357	dog 1217 white 608
food	red 4 shirt 4	plate 12 food 9
football	man 3 play 3	soccer 14 group 9
polo	people 97 sit 96	horse 507 rid 497
RockClimbing	rock 184 red 123	rid 219 skateboard 178
sailing	rock 144 stand 122	boat 488 water 444
snowboarding	climb 98 rock 97	rid 403 snowboard 376
travelling	rock 4 red 2	stand 6 beach 6



Preferences modeling. LDA

Flickr8K model

football, 0.70874625, 0.023*"game" + 0.013*"team" + 0.012*"play" + 0.008*"season" + 0.007*"hockey"
football, 0.12294937, 0.014*"bike" + 0.007*"cleveland" + 0.007*"motorcycl" + 0.006*"freenet" + 0.005*"road"
football, 0.107538104, 0.010*"caltech" + 0.009*"orbit" + 0.008*"henri" + 0.006*"toronto" + 0.006*"earth"

cats, 0.32299325, 0.012*"stanford" + 0.010*"run" + 0.010*"game" + 0.009*"pitch" + 0.007*"team"
cats, 0.30530256, 0.051*"drive" + 0.018*"disk" + 0.015*"control" + 0.013*"hard" + 0.008*"floppi"
cats, 0.15716127, 0.019*"bike" + 0.014*"entri" + 0.012*"ohio" + 0.008*"motorcycl" + 0.008*"output"
cats, 0.15212314, 0.024*"game" + 0.021*"team" + 0.016*"play" + 0.012*"hockey" + 0.011*"player"
cats, 0.06156329, 0.013*"israel" + 0.011*"isra" + 0.009*"jew" + 0.007*"kill" + 0.007*"arab"

ShowAndTell model + Beam Search

football, 0.37206718, 0.028*"game" + 0.027*"team" + 0.016*"player" + 0.016*"play" + 0.014*"hockey"
football, 0.31475544, 0.011*"kill" + 0.008*"govern" + 0.007*"attack" + 0.007*"happen" + 0.006*"leav"
football, 0.29771936, 0.012*"cleveland" + 0.012*"game" + 0.011*"play" + 0.010*"cwru" + 0.008*"period"

cats, 0.77231395, 0.016*"sale" + 0.013*"price" + 0.013*"ohio" + 0.010*"sell" + 0.007*"magnus"
cats, 0.1436214, 0.010*"drug" + 0.006*"live" + 0.006*"gun" + 0.005*"alaska" + 0.005*"money"
cats, 0.035903748, 0.030*"window" + 0.015*"file" + 0.014*"server" + 0.010*"program" + 0.010*"widget"
cats, 0.0139177395, 0.007*"happen" + 0.007*"sandvik" + 0.007*"children" + 0.006*"koresh" + 0.006*"kent"
cats, 0.012430151, 0.014*"uiuc" + 0.011*"colorado" + 0.008*"uchicago" + 0.007*"lose" + 0.006*"east"
cats, 0.011357374, 0.027*"game" + 0.024*"team" + 0.017*"play" + 0.015*"player" + 0.011*"hockey"



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