INFO7374 Progress Report

Summary	This codelab is the final project progress report
URL	https://github.com/ll1195831146/Infor7374-AI/tree/master/Final%20Project
Category	Photo tagging
Environment	Keras, Python
Status	Done
Feedback Link	https://github.com/ll1195831146/Infor7374-AI/tree/master/Final%20Project/issues
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Kaggle Competition

--iMet Collection 2019

04.10.2019

Competition URL: https://www.kaggle.com/c/imet-2019-fgvc6

Xiangyu Chen

Lei Liu

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Final Project : INFO 7374 Special Topics in Info Systems

Milestones

Timeframe	Delivery
Day 1-4	Data Preprocessing and Exploratory Data Analysis
Day 5-10	Model Building, Training
Day 11-12	Model selection and Performance
Day 13-14	Documentation

Current project status compared to plan

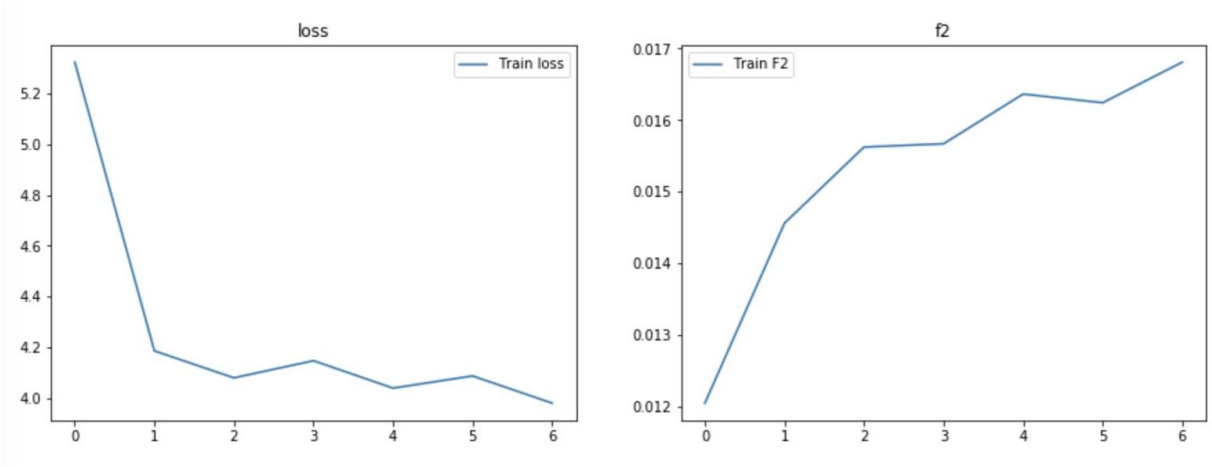
Hyper-parameter

SIZE = 256
NUM_CLASSES = 1103
LR_MAX=1e-3
EPOCHS=7
BATCH_SIZE=256

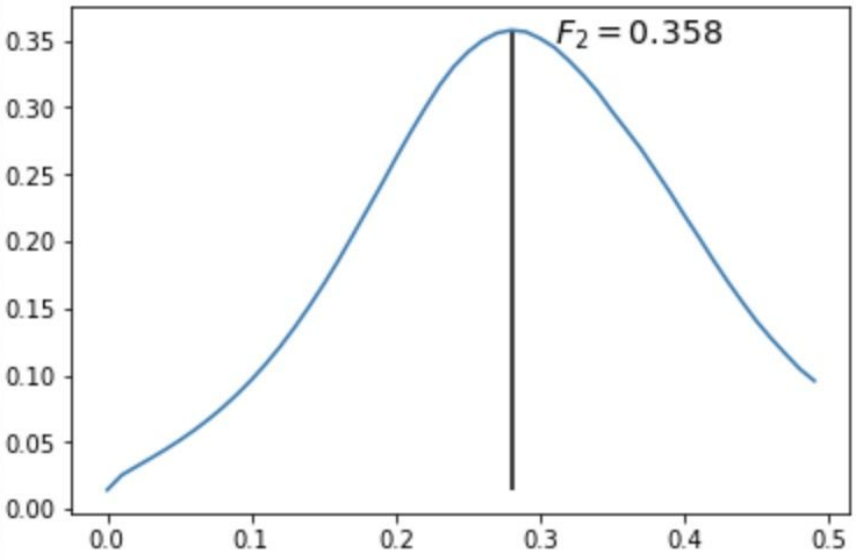
Experiments

Pre-trained Model Name	Loss	F2 Score
ResNet-50	5.5789	0.202
InceptionResNetV2	3.9787	0.367
Vgg19	5.1273	0.0757
Xception	3.9788	0.358

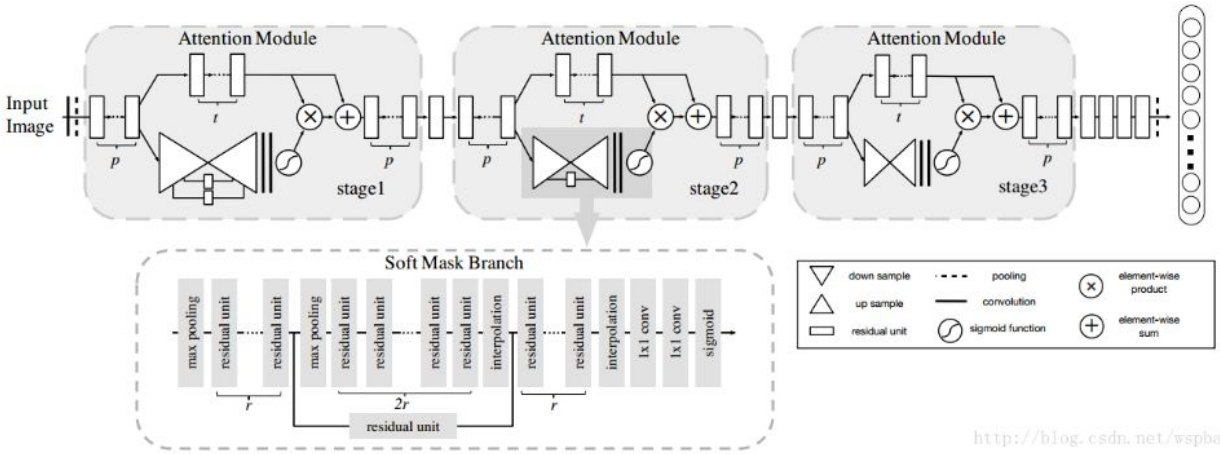
Results




```
best_thr, best_score = find_best_fixed_threshold(last
100%|██████████| 50/50 [00:13<00:00,  3.67it/s]
thr=0.280 F2=0.358
```



Residual Attention Network for Image Classification



Layer	Output Size	Attention-56	Attention-92
Conv1	112×112	7×7, 64, stride 2	
Max pooling	56×56	3×3 stride 2	
Residual Unit	56×56	$\begin{pmatrix} 1 \times 1, 64 \\ 3 \times 3, 64 \\ 1 \times 1, 256 \end{pmatrix} \times 1$	
Attention Module	56×56	Attention $\times 1$	Attention $\times 1$
Residual Unit	28×28	$\begin{pmatrix} 1 \times 1, 128 \\ 3 \times 3, 128 \\ 1 \times 1, 512 \end{pmatrix} \times 1$	
Attention Module	28×28	Attention $\times 1$	Attention $\times 2$
Residual Unit	14×14	$\begin{pmatrix} 1 \times 1, 256 \\ 3 \times 3, 256 \\ 1 \times 1, 1024 \end{pmatrix} \times 1$	
Attention Module	14×14	Attention $\times 1$	Attention $\times 3$
Residual Unit	7×7	$\begin{pmatrix} 1 \times 1, 512 \\ 3 \times 3, 512 \\ 1 \times 1, 2048 \end{pmatrix} \times 3$	
Average pooling	1×1	7×7 stride 1	
FC,Softmax	1000		
params $\times 10^6$		31.9	51.3
FLOPs $\times 10^9$		6.2	10.4
Trunk depth		56	92

https://arxiv.org/pdf/1704.06904.pdf

What went well ? What are you working on to improve?

Went Well:

1. Pre-trained model: Inception ResNet V2
2. Model in Progress: Residual Attention CNN

Working On:

1. Warm-up model: using callback function
2. Data Augmentation
3. Model in the Consideration: Multi-Attention CNN
   http://openaccess.thecvf.com/content_ICCV_2017/papers/Zheng_Learning_Multi-Attention_Convolutional_ICCV_2017_paper.pdf

Steps so you can achieve the promised deliverables next week.

1. Build Multi-Attention CNN & Residual Attention CNN model based on Inception ResNet V2
2. Compare and select best one in our experiments
3. Optimize hyper-parameters and model to achieve highest f2 score in limited running time(9 hours)

How can Professor or the TA help if there are any major sticky points.