Yelp Photo Classification

Mi Yan

Food?

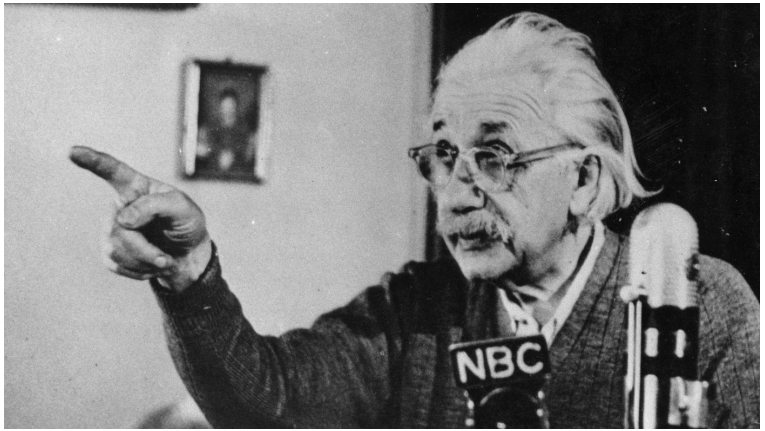
or

Drink?

Food?

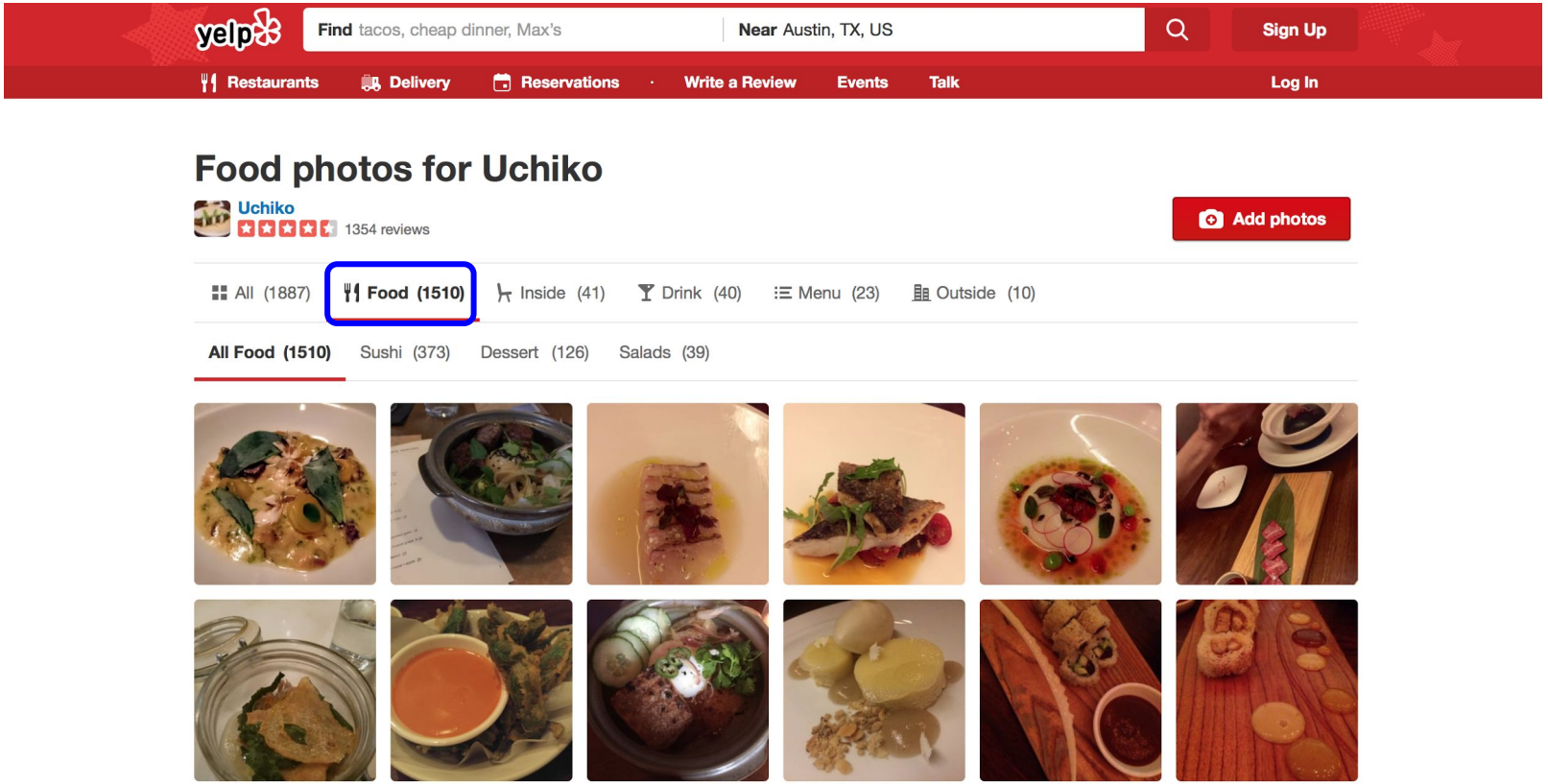
or

Drink?



Food	0.0001
Drink	0.9999

Food	0.0001
Drink	0.9999

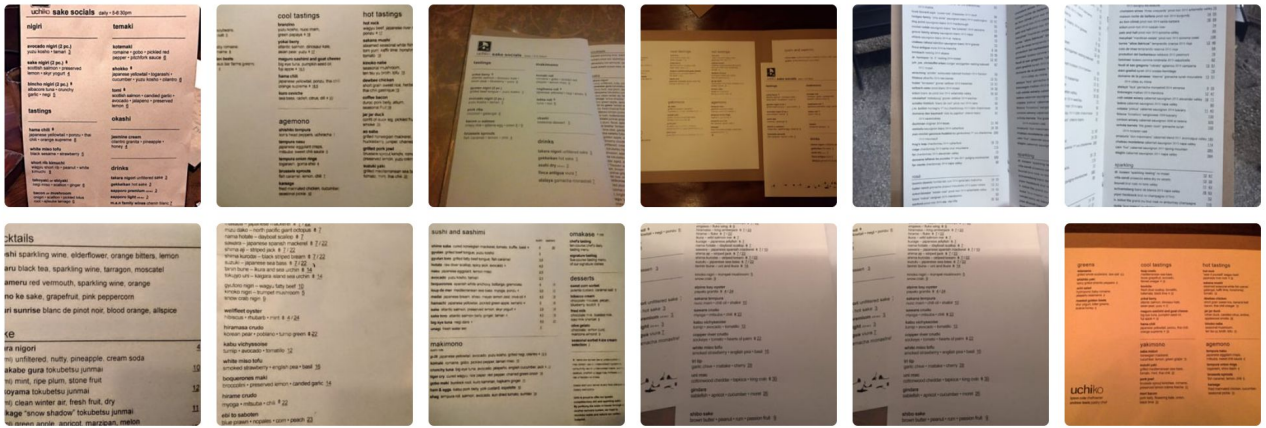

yelp
Find tacos, cheap dinner, Max's
Near Austin, TX, US
Sign Up
Restaurants
Delivery
Reservations
Write a Review
Events
Talk
Log In
Food photos for Uchiko
Uchiko
1354 reviews
Add photos
All (1887)
Food (1510)
Inside (41)
Drink (40)
Menu (23)
Outside (10)
All Food (1510)
Sushi (373)
Dessert (126)
Salads (39)

Menu photos for Uchiko

Uchiko
1355 reviews

Add photos

All (1889) Food (1510) Inside (41) Drink (40) **Menu (23)** Outside (10)



yelp

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Drink photos for Uchiko

Uchiko

1355 reviews

Add photos

All (1889) | Food (1510) | Inside (41) | Drink (40) | Menu (23) | Outside (10)



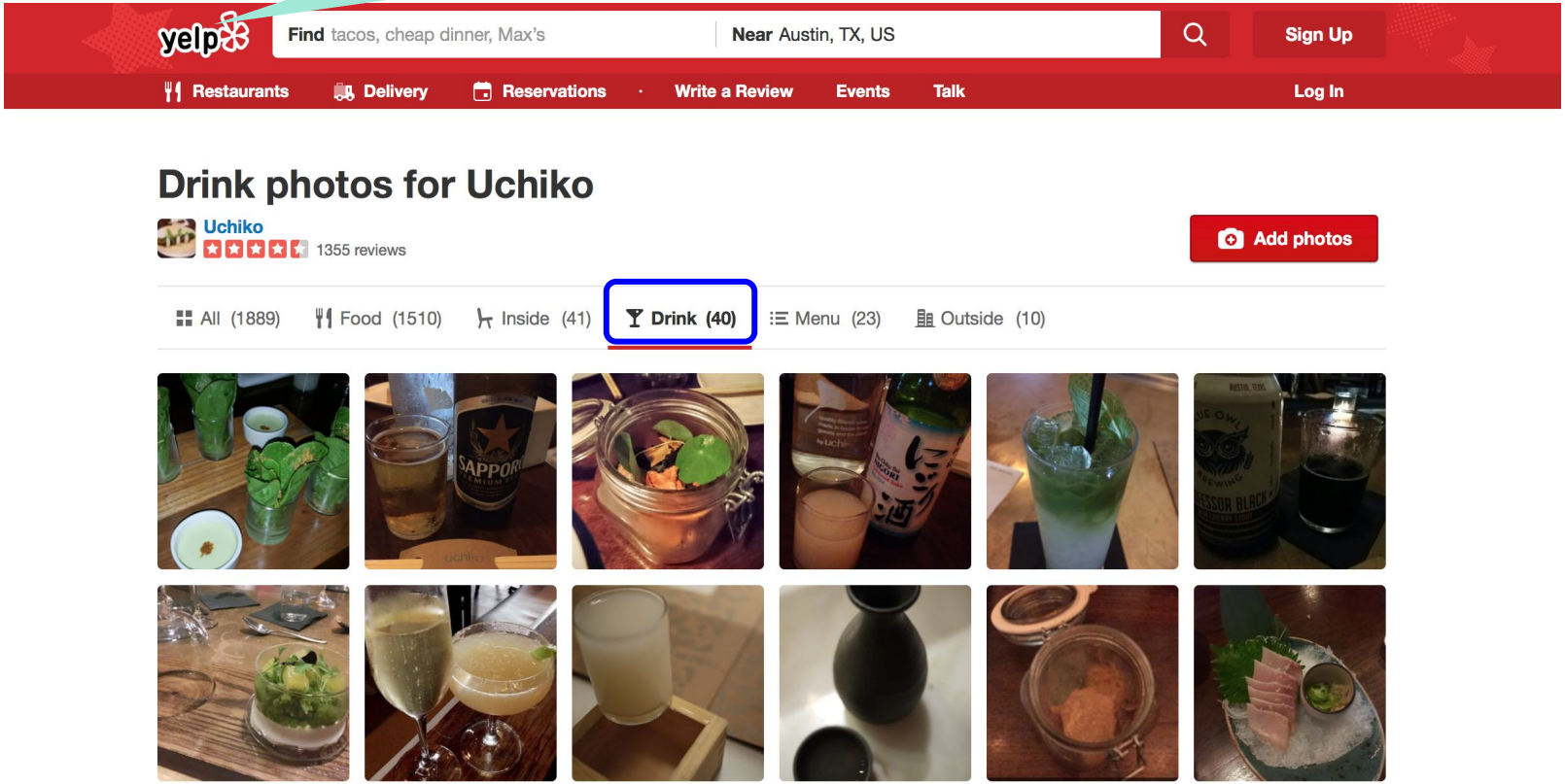








On an evenly split test set, …., overall precision of 94%, and recall of 70%. While these numbers can definitely be improved, …..



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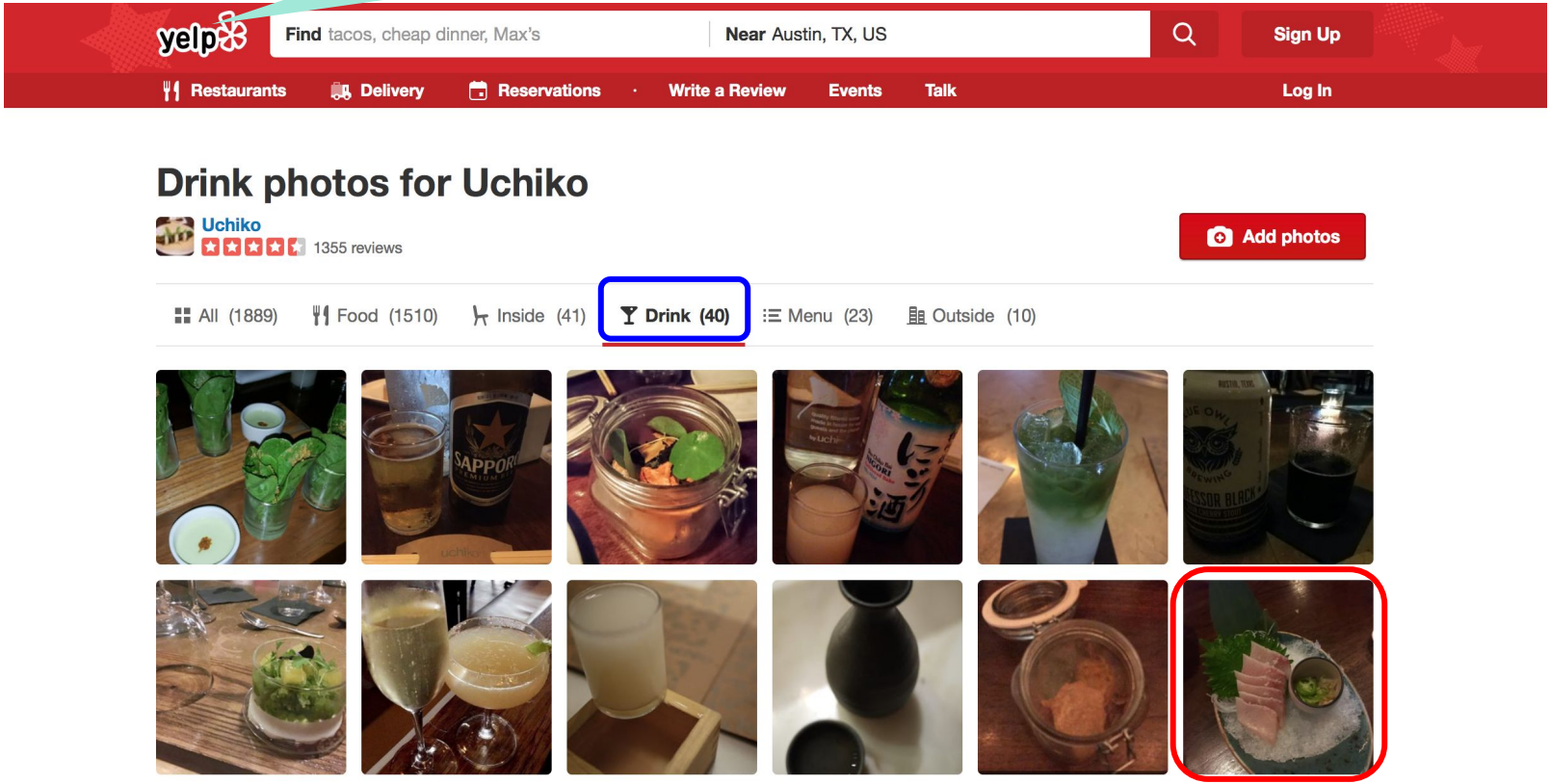

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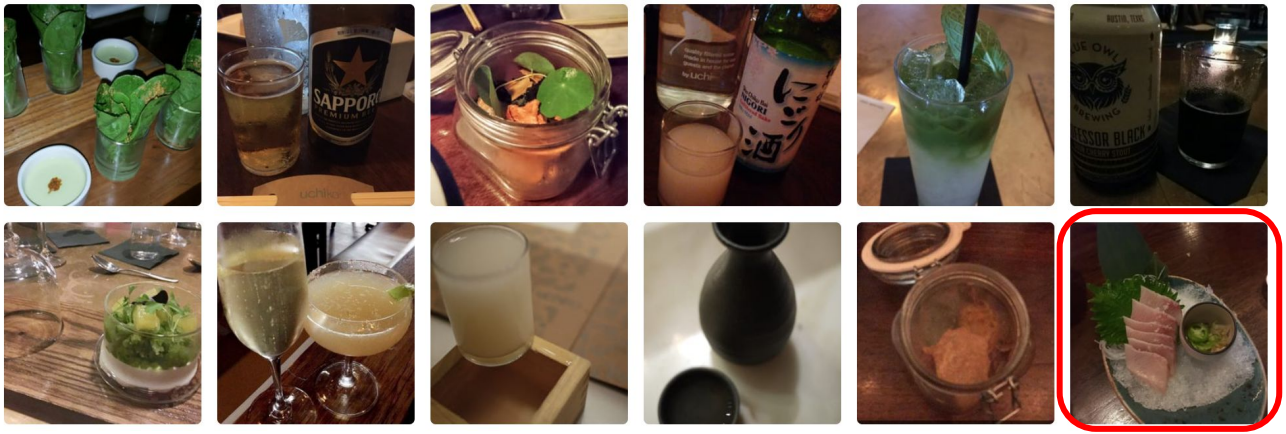
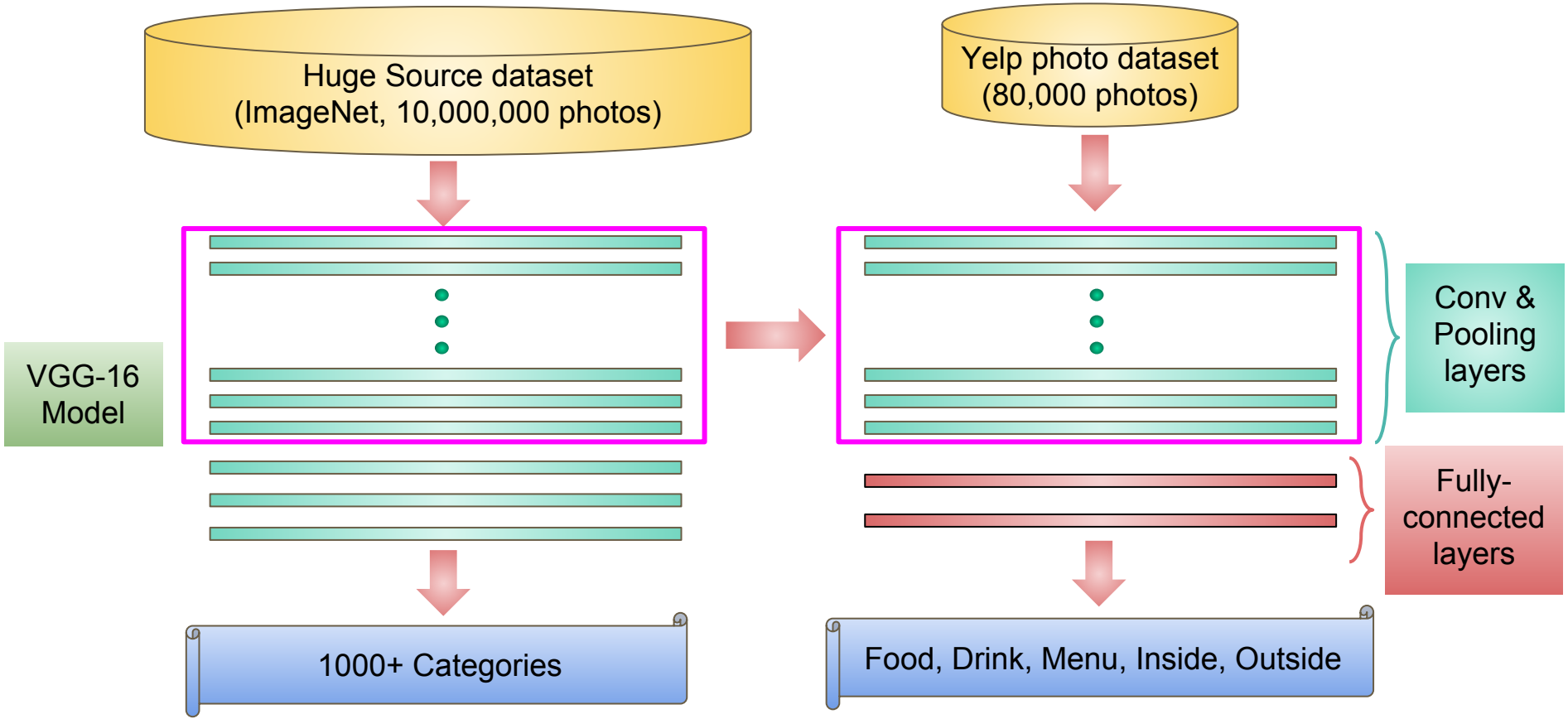
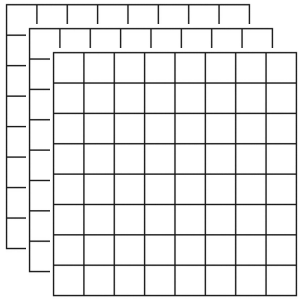


Convolutional Neural Network Transfer Learning



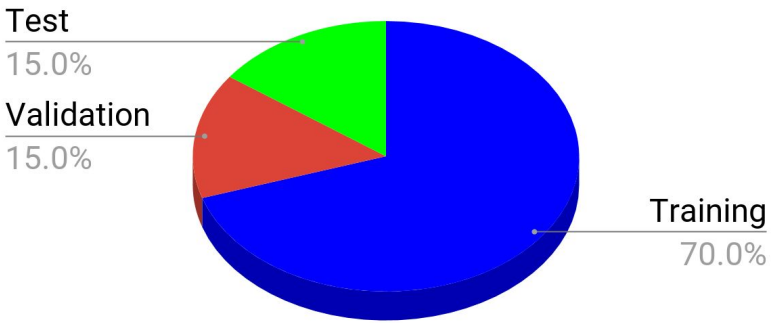
Dataset and Resources

Input: 128 x 128 x 3 (RGB)



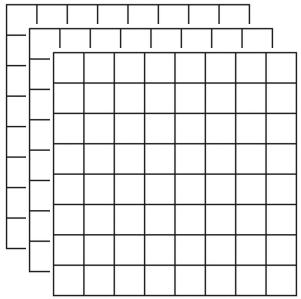
80,000 photos

Dataset Split



Dataset and Resources

Input: 128 x 128 x 3 (RGB)



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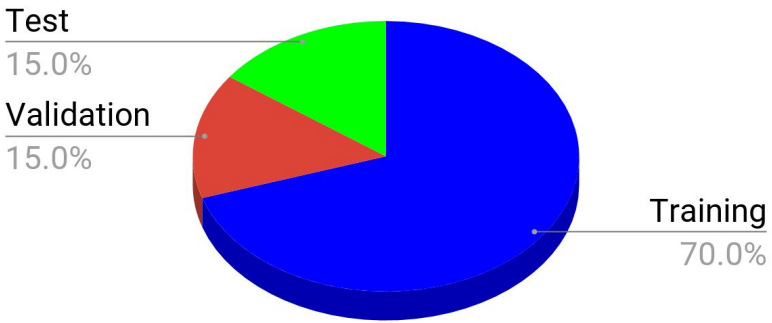
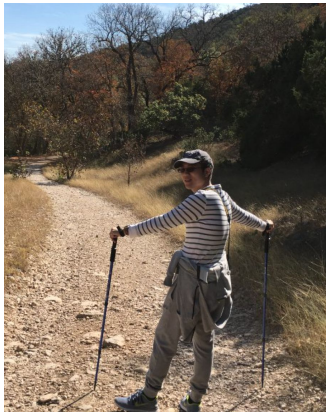
Dataset Split



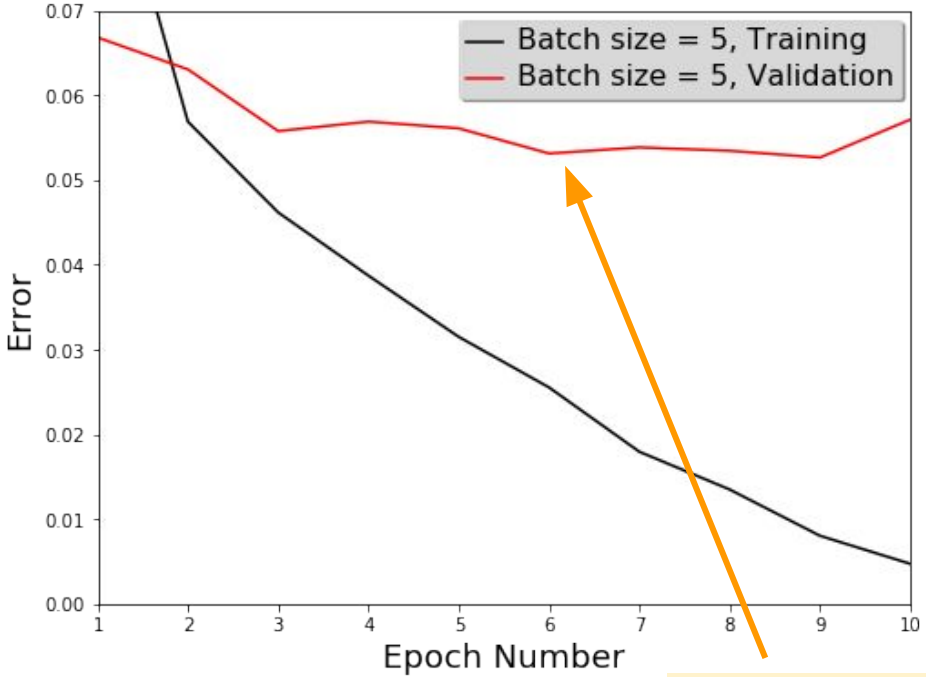
CPU (my mac)

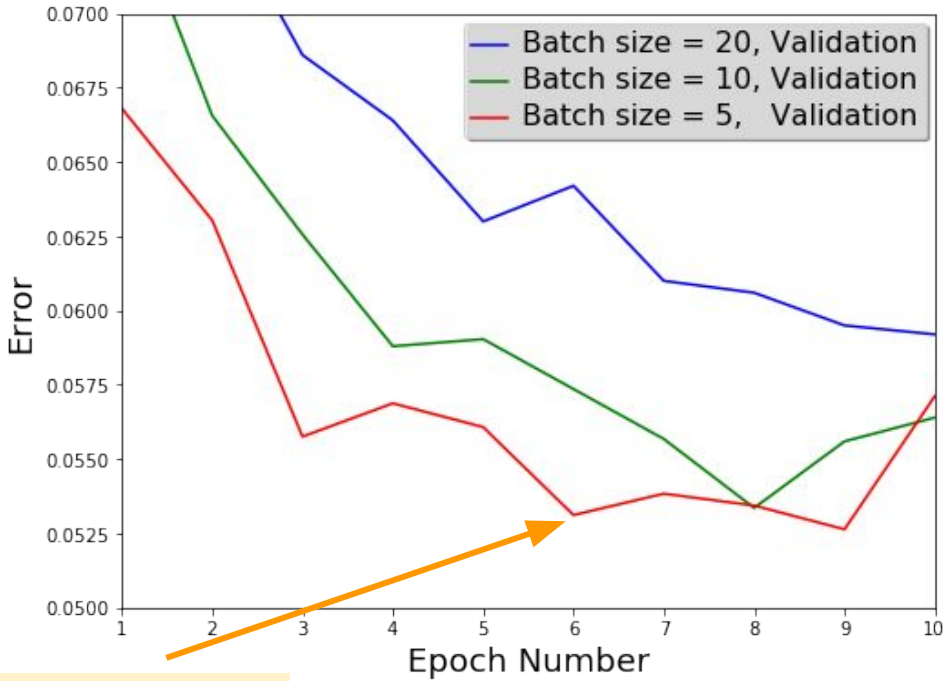


GPU (AWS EC2)

~100 Times Faster

Training / Validation error curves

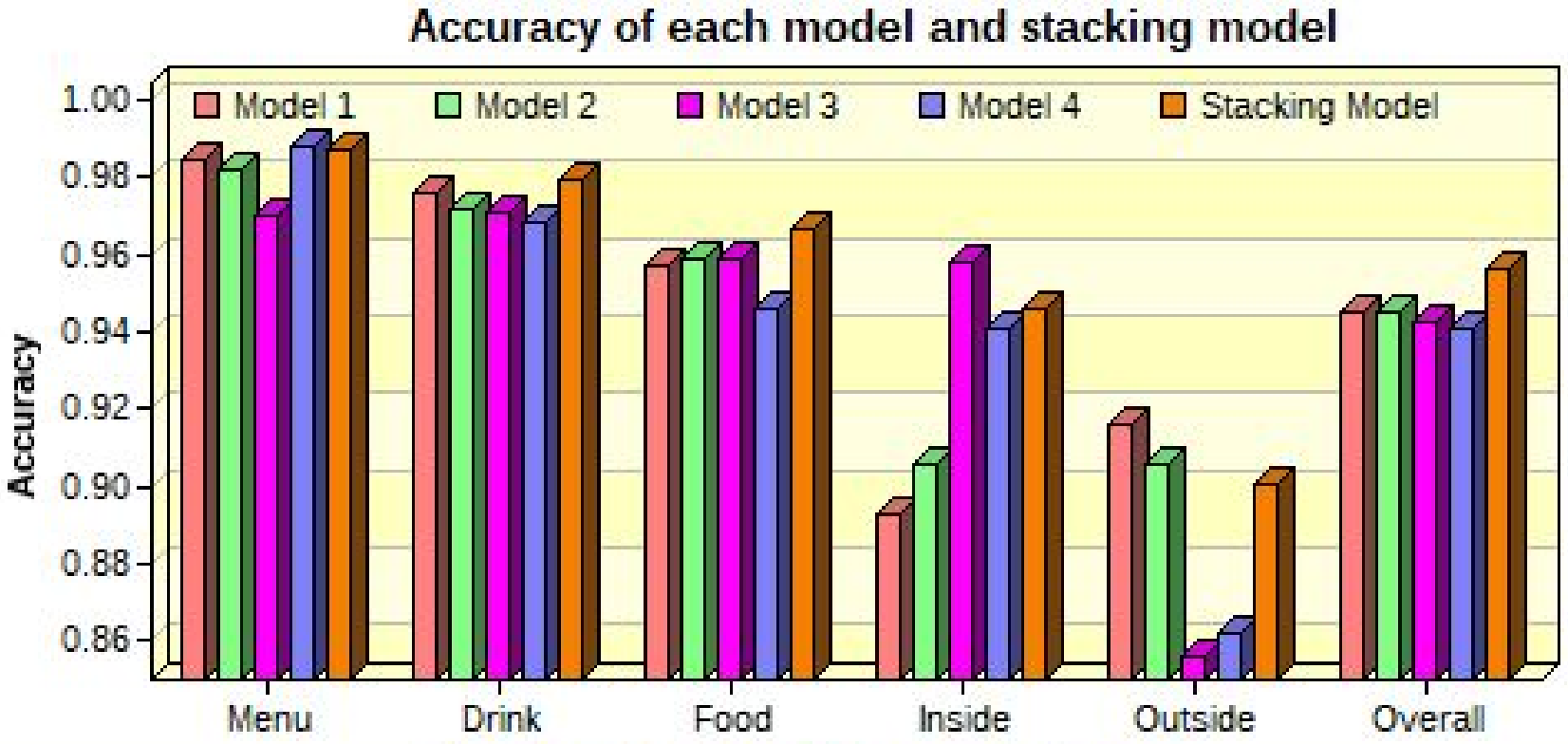




Optimal epoch = 6
Optimal batch size = 5

Stacking Model for Validation data

Weighted Average: Stacking Model = 27% * Model1 + 14% * Model2 + 36% * Model3 + 23% * Model4



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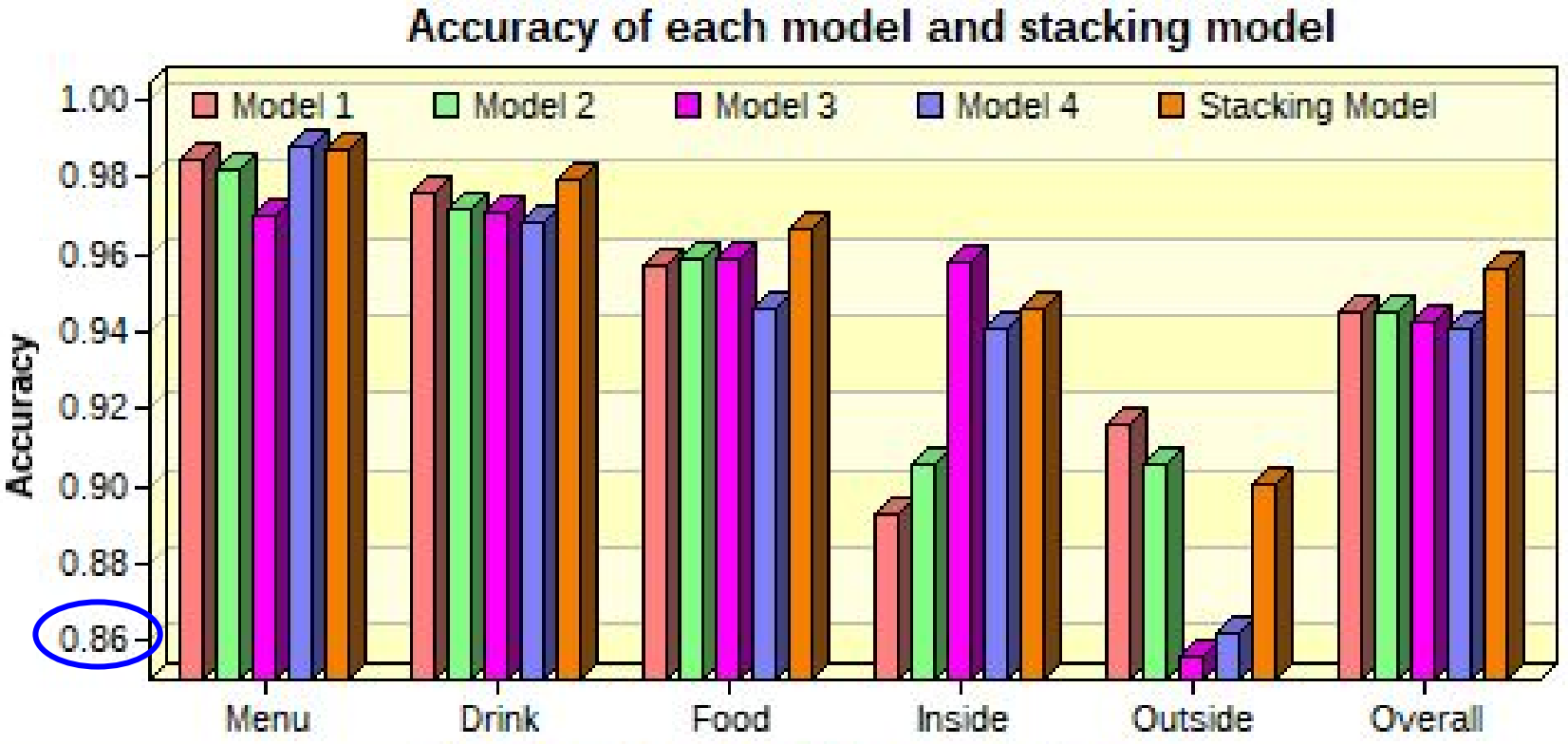

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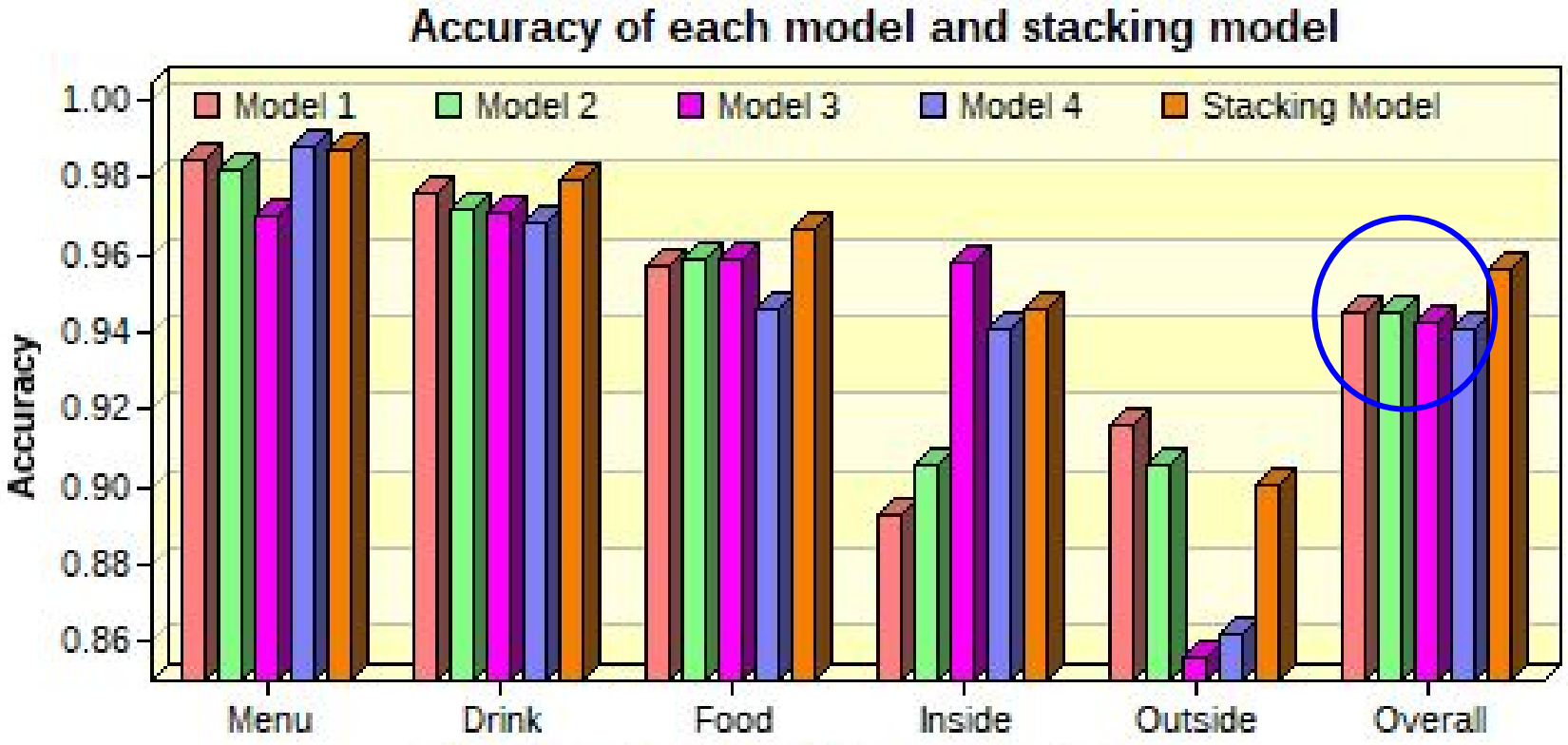

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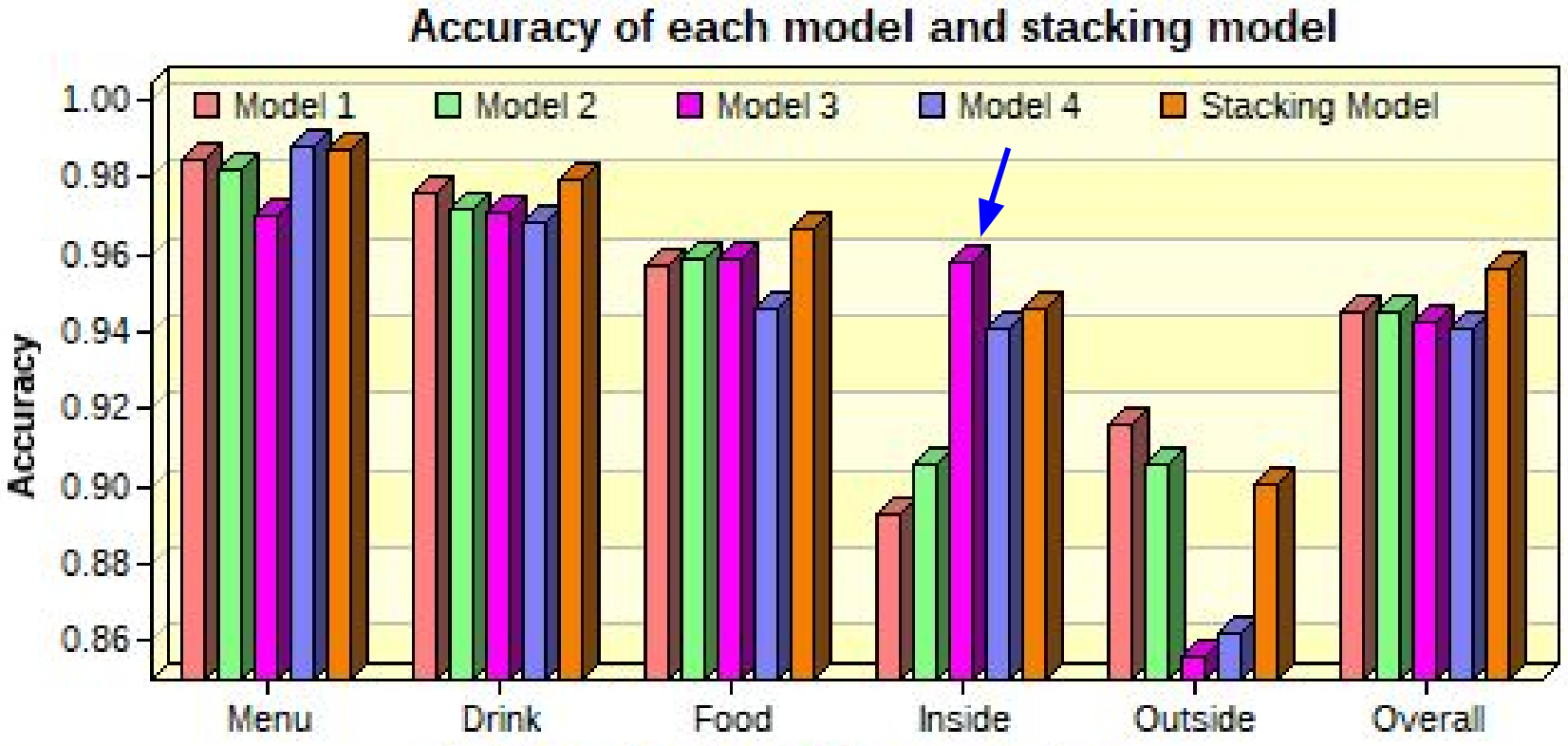

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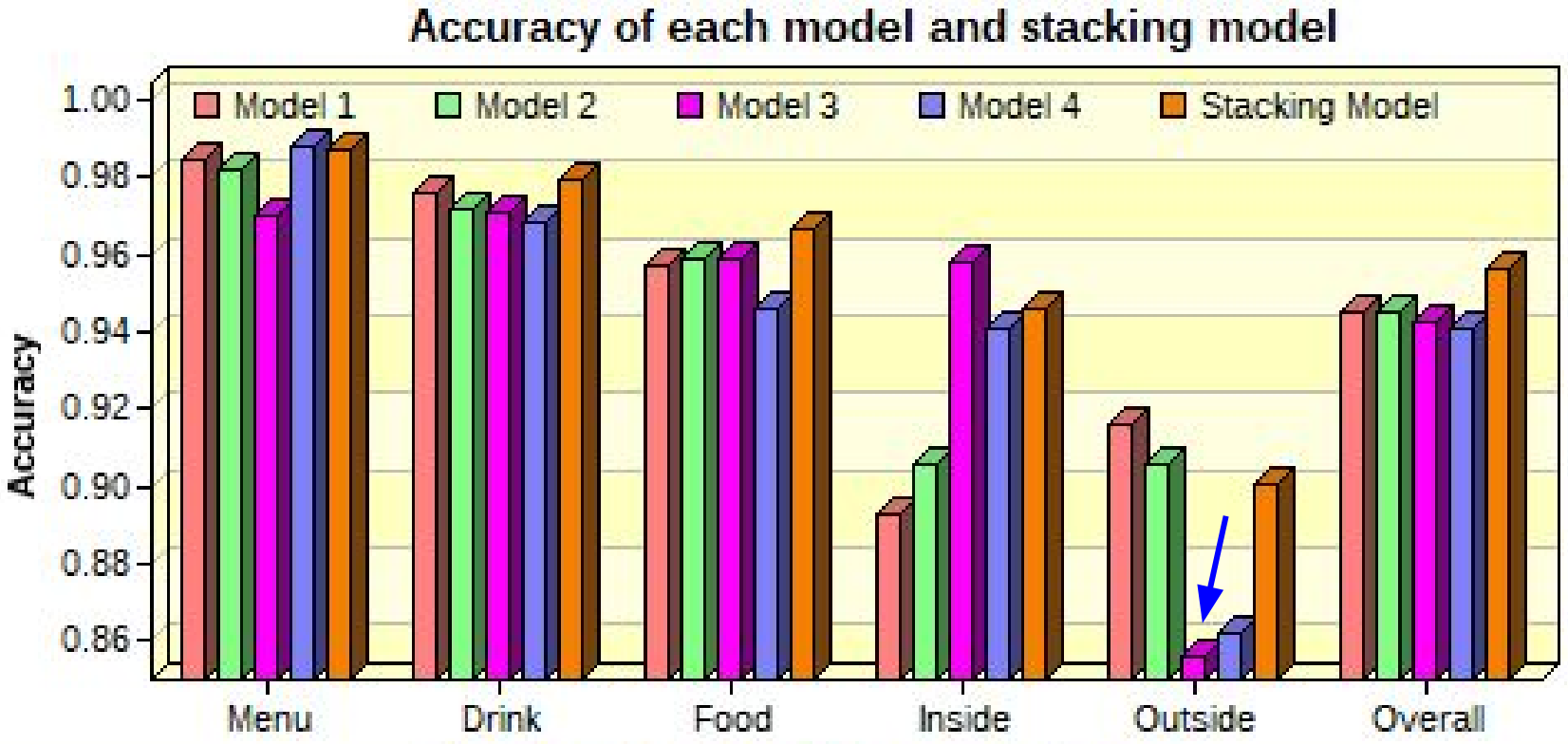

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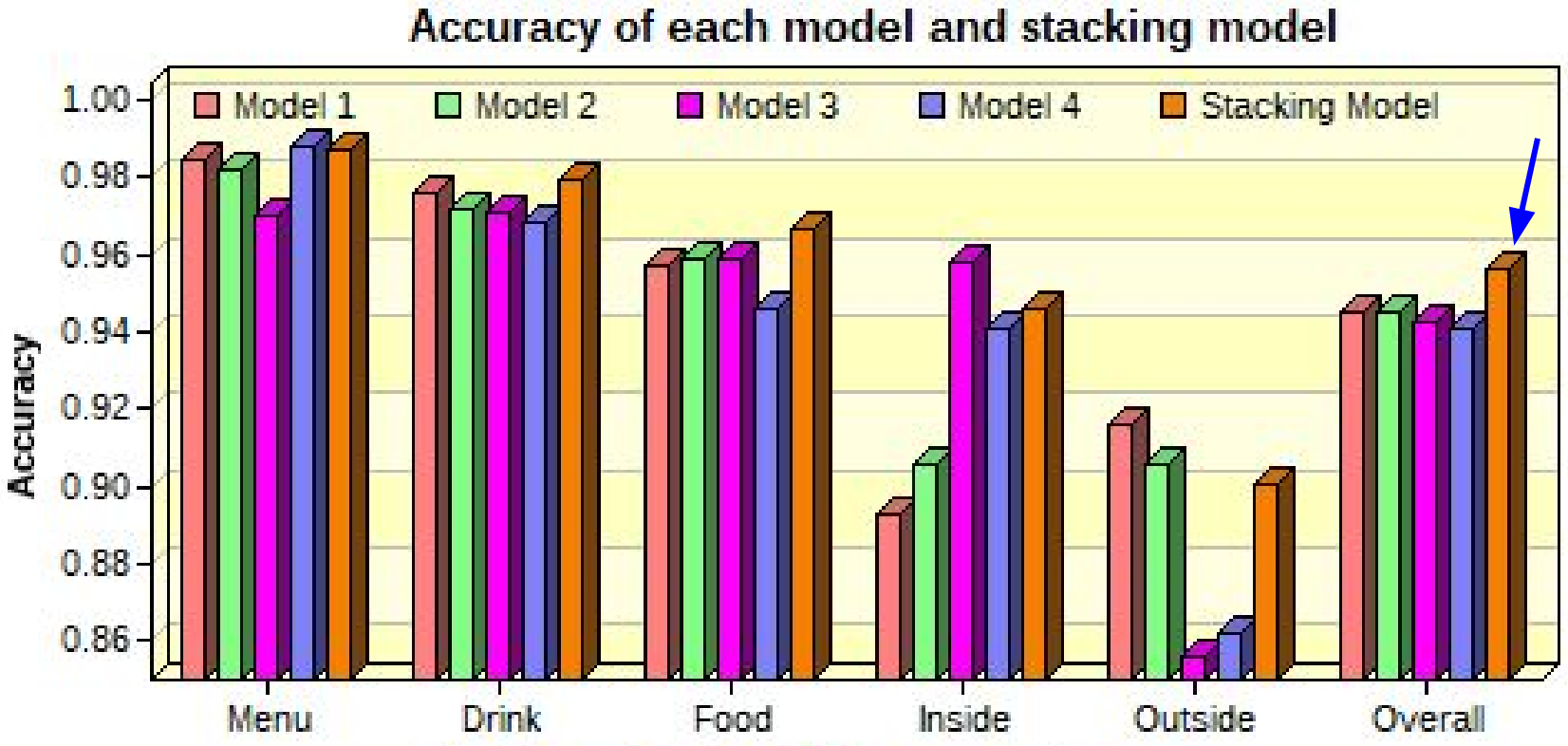

Predicted Probability

	Menu	Drink	Food	Inside	Outside
					
Menu	0.9999	9.953e-08	0.0007	1.065e-06	0.0003
Drink	3.917e-08	0.9999	0.3094	1.376e-07	2.080e-05
Food	1.101e-08	3.971e-07	0.6866	3.950e-07	0.0012
Inside	2.541e-08	7.883e-09	0.0012	0.9988	0.0009
Outside	2.227e-06	4.644e-08	0.0020	0.0012	0.9976

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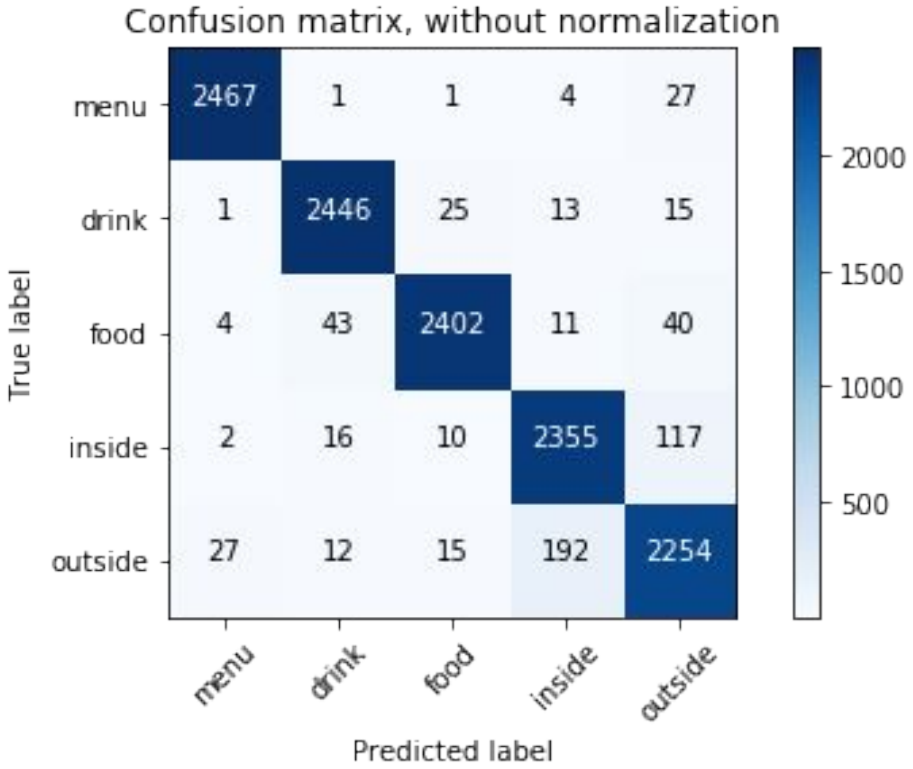
Confusion Matrix for Test data



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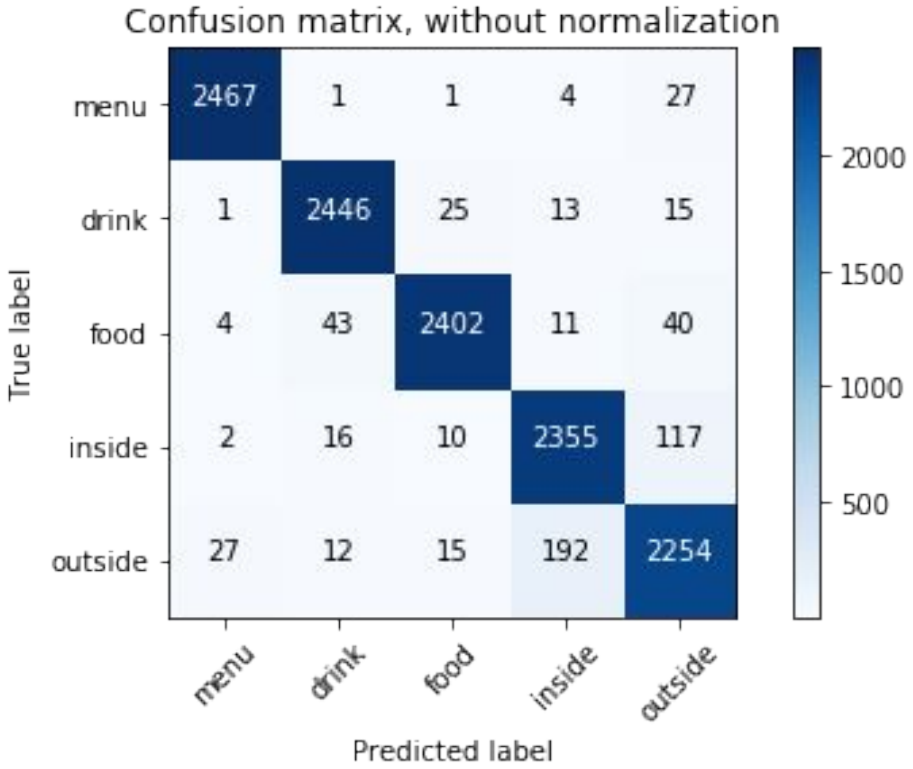
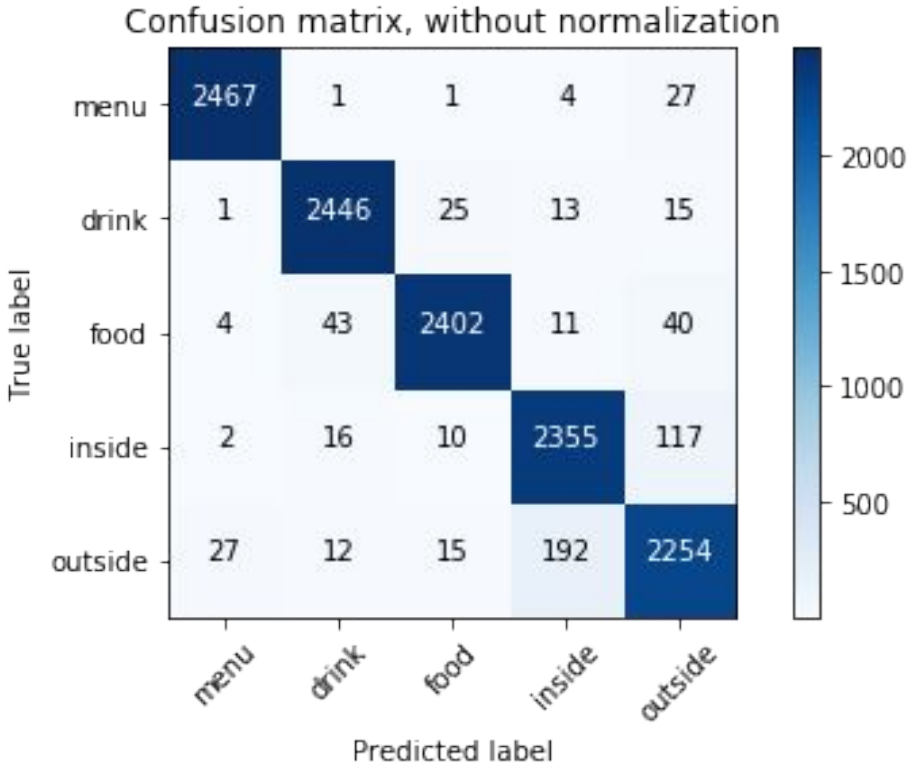


Accuracy = 95.39%

Precision = 95.47%

Recall = 95.39%

Confusion Matrix for Test data



Accuracy = 95.39%

Precision = 95.47% *vs* 94% (yelp)

Recall = 95.39% *vs* 70% (yelp)

Questions?

Mi Yan

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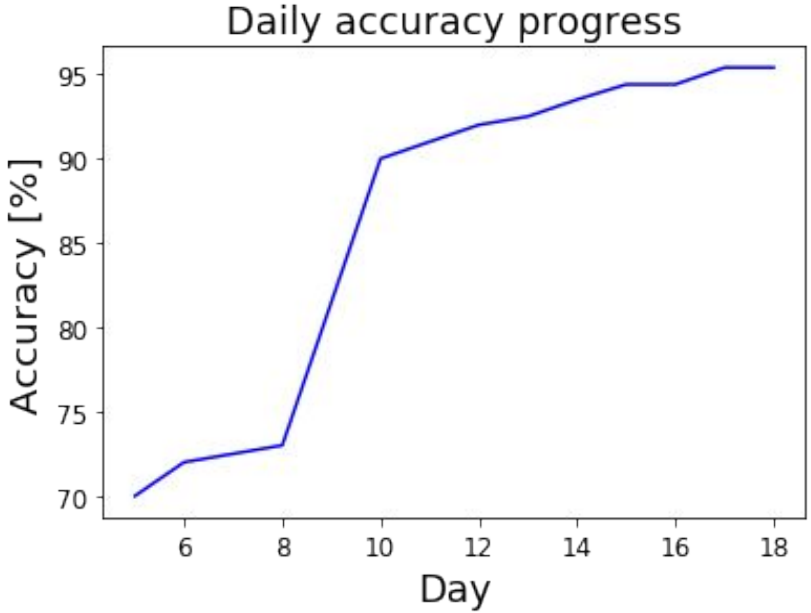
Github: https://github.com/MiYan617/Projects

Email: yanmi617@gmail.com



Summary

- Train a photo classifier based on CNN transfer learning algorithm
- Improve the precision and recall
- Mislabel could be one reason limiting the further improvement
- Other base models or model stacking methods may help more