CHOWNET: An Image Dataset for Local African Food

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ABSTRACT

People from different cultural background eat different food and studies[1] has shown that people feel connected to their food choices as a form of identity.

In our effort to contribute to the data collection process in Africa, we want to build a large scale image dataset for African local food and we seek to collect 200-500 image dataset for different local African foods across the continent starting with Nigeria.

MOTIVATION

In today's world of massive data expansion diversity of dataset is a major problem. We were inspired by the ImageNet 2011[2] which has over 15 million labelled high-resolution images with over 32,000 synsets in the subtree.

Although ImageNet has over 20,000 Images of the Misc synsets which shows a lot of collated food items, this is however not inclusive with missing popular African dishes like "Jollof Rice", "Fufu" etc.

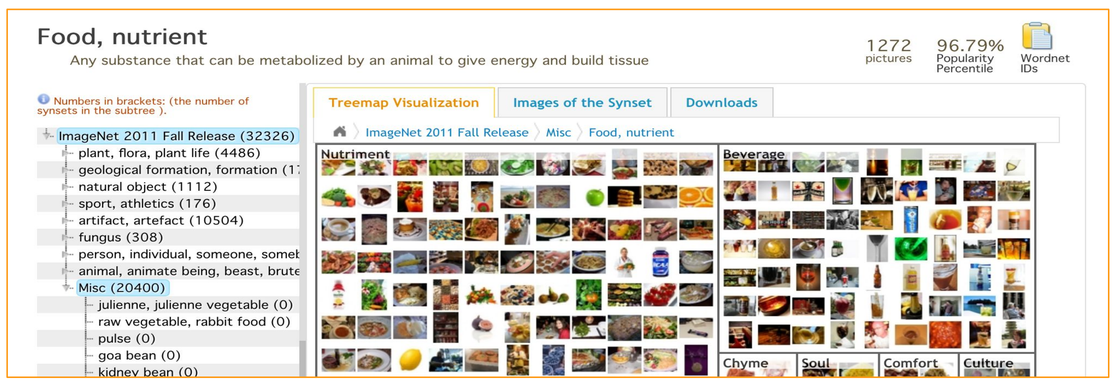

Fig. 1: Subset of food dataset in ImageNet

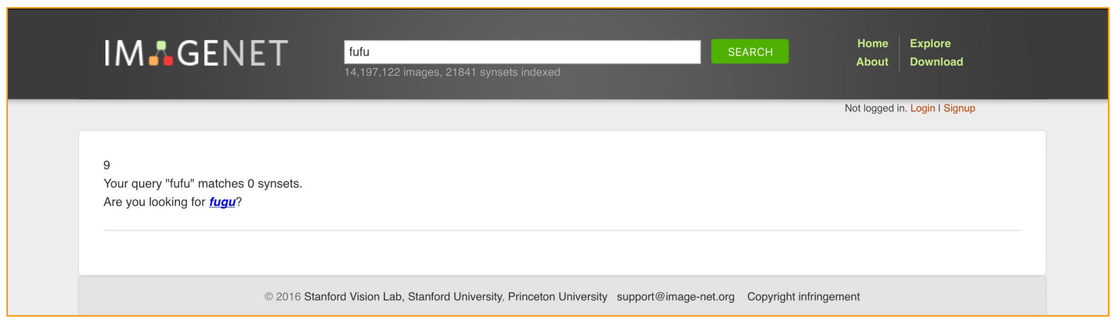

Fig. 2: Where is fufu?

The fact that Local African dishes are not well represented in the ImageNet dataset poses a major challenge in the Artificial Intelligence community. Since most pre-trained models are built from this underrepresented dataset which tends to suffer from misclassification error like the one below.

Fig. 3: Real time object detection using Tensorflow and Opencv

METHODS

we are exploring an unconventional method of community involvement throughout our project, we approached collecting a list of popular food labels through twitter. We were able to compile a list of 63 popular Nigerian Dishes.

After compiling this list, we decided to start with the 15 most popular listed food item.

55	ewa agoyin	chosen
56	dambu nama	
57	abacha	
58	nsala soup	
59	oha soup	
60	ukwa	
61	okpa	
62	bread	chosen
63	others	
64	fish	

Table 1: List of popular Local Dish

Approach 1: we created an android app which allows for easy acquisition and tagging of food item images, these images will then be uploaded to a popular Cloud Image service, Cloudinary and organized in seperate folders. This approach yielded little data.

Approach 2: we created a github repository - this didn't scale well.

Approach 3: we utilized Google cloud by creating a public Google drive folder in which anyone could access and simply drag and drop images into different folder. This method yielded the most data but it doesn't seem scalable.

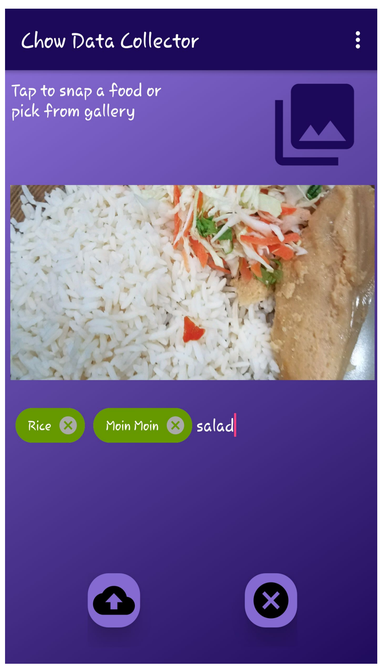

Fig.4: ChowNet Mobile App

EXPERIMENTAL RESULTS

So far, we have received a total of **568** image submissions in 15 different classes.

Food Folder	Count_drive	Count_app	Count_github
Amala	5	0	0
Beans	87	1	0
Bread	8	1	0
Chicken	21	4	0
Efo-riro	0	0	0
Eggs	12	2	0
Egunsi	219	1	0
Noodles	16	0	0
Rice	73	15	0
Yam	18	3	0
Semo	9	0	2
Spagetti	29	0	0
Porridge Yam	17	1	0
Pounded Yam	0	0	0
Others	10	14	0
Total	**524**	**42**	**2**

Table 2: Dataset Aggregate

Fig.5a: Jollof & Fried Rice & co

Fig.5b: Wrapped Semo

PROPOSED FUTURE USE CASES

- **Food Classification and Detection**
- **Nutrition content viewer**
- **Food Recommender systems**
- **Educational-Health resource**

CONCLUSION

We've been able to propose the importance of collecting food image data and the prospects it has on making locally relevant datasets available to African AI researchers. We've also discussed interesting use cases for the dataset. Our progress so far has been reported but we still have a lot more to do. Our future work is to build a more robust Android and Web app to enable us to collect data in a more efficient manner and scale our project across Africa.

REFERENCES

1. Gina M. Almerico. Food and Identity: Food studies, cultural, and personal identity. Journal of International Business and Cultural Studies Volume 8 - June, 2014
2. Jia Deng, Wei Dong, Richard Socher, Li-Jia Li, Kai Li and Li Fei-Fei. ImgeNet: A Large-Scale Hierarchical Image Database. Computer Vision and Pattern Recognition, 2009.