Milk Yield Prediction

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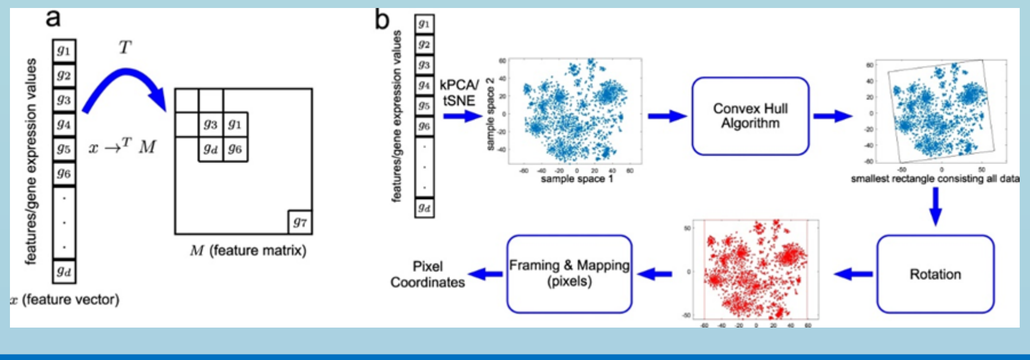
Introduction

With the trend of digital transformation, the farming industry has also started to embrace new technology. In the state of reduction in staff, the average milk production in Taiwan has surpassed that of Australia, Germany, and China, and is still rising year by year. This final project is based on the Dairy Herd Improvement (DHI) database provided by the Dairy Association of Taiwan to predict milk production in different regions of Taiwan. We hope that we could find some key factors affecting milk production and have contributed to intelligent farm management in Taiwan.

Pre-Processing

- Normalize the range of continuous data
- Label encoding for categorical data
- Dimension reduction
- Convert features into images



Model

- ResNet

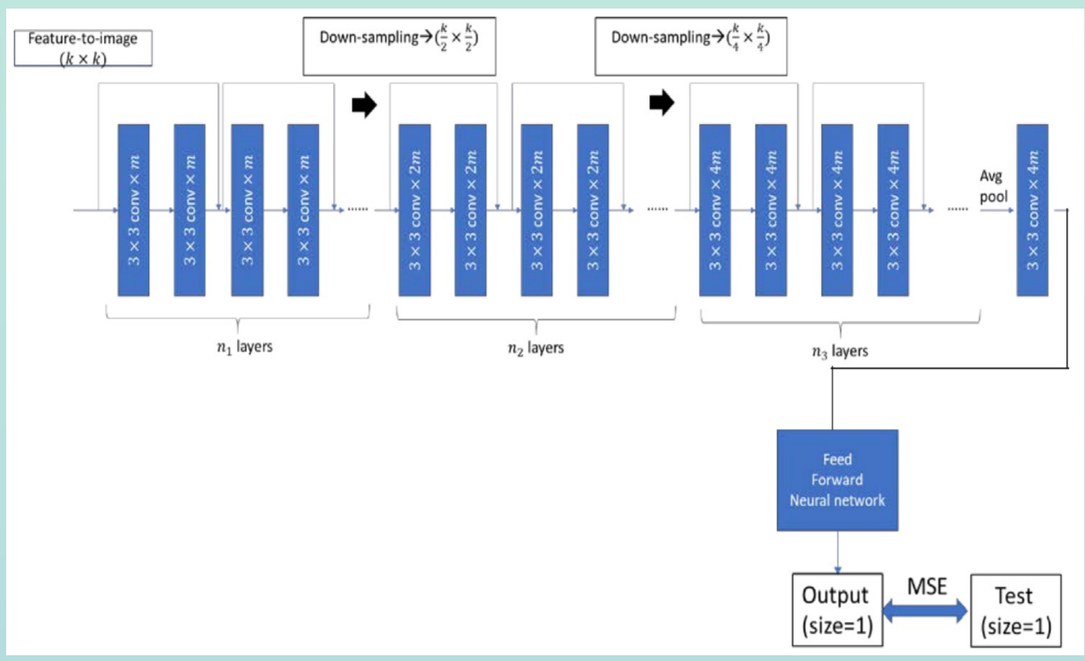
Apply the network on the image-like input data is inferred to enhance model performance.

- Feed-Forward Neuron Network

The high dimensional feature map “(k/4)x (k/4)x(4m)” enters a feed-forward neural network, and returns an output with size 1.

- Prediction

Mean squared error (MSE) is chosen as the loss function. After that, we apply ensemble methods to optimize model performance by aggregating several candidate models.



Result

1	Team14	5.6525019	2021/01/15 00:50:10	32
2	^ ^	5.8105289	2021/01/19 04:08:50	20
3	11111	5.8497059	2021/01/19 13:59:34	84
4	gggggggg	5.8730566	2021/01/19 00:57:54	70
5	Team 7	5.9476361	2021/01/19 15:00:21	157
6	嘿嘿 bingo答對了 我是白爛	5.9731053	2021/01/19 00:25:05	226
7	K	6.0126836	2021/01/19 15:23:36	34
8	wengtai	6.1091248	2021/01/19 15:24:04	1162
9	HI	6.4491362	2021/01/19 14:49:05	62
10	ggssgsffff	6.5157876	2021/01/19 02:51:21	12
11	cowcow	6.5881365	2021/01/18 20:03:58	10
12	Team5	6.6202385	2021/01/19 00:43:55	79
13	Team8	6.7819450	2021/01/18 00:20:45	2520
14	VipLabIsAllYouNeed	8.3563474	2021/01/19 15:23:10	637

Summary

- Data cleaning & data preprocessing

As we have known the concept of “garbage in, garbage out,” it’s important to “process” raw data into some reasonable formats.

- Ensemble learning techniques

Take advantage of the power of ”Two heads are better than one.”