



E-SAN THAILAND CODING & AI ACADEMY

โครงการวิจัยโมเดลระบบบูรณาการเรียนรู้ Coding & AI สำหรับเยาวชน
Model of Learning Ecosystem Platform integrate with Coding & AI for Youth

โครงการย่อยที่ ๖

การพัฒนาเยาวชนเพื่อเข้าสู่วิชาชีพขั้นสูงด้าน Coding & AI
ร่วมกับ Coding Entrepreneur & Partnership: Personal AI

BiTNet: AI for Ultrasound Image Classification

ผศ.ดร.วนพงศ์ อิบตระ
ผู้เชี่ยวชาญด้าน Computer Vision



Add a little bit of body text

Data preparation



ไทย THAILAND
CODING & AI ACADEMY

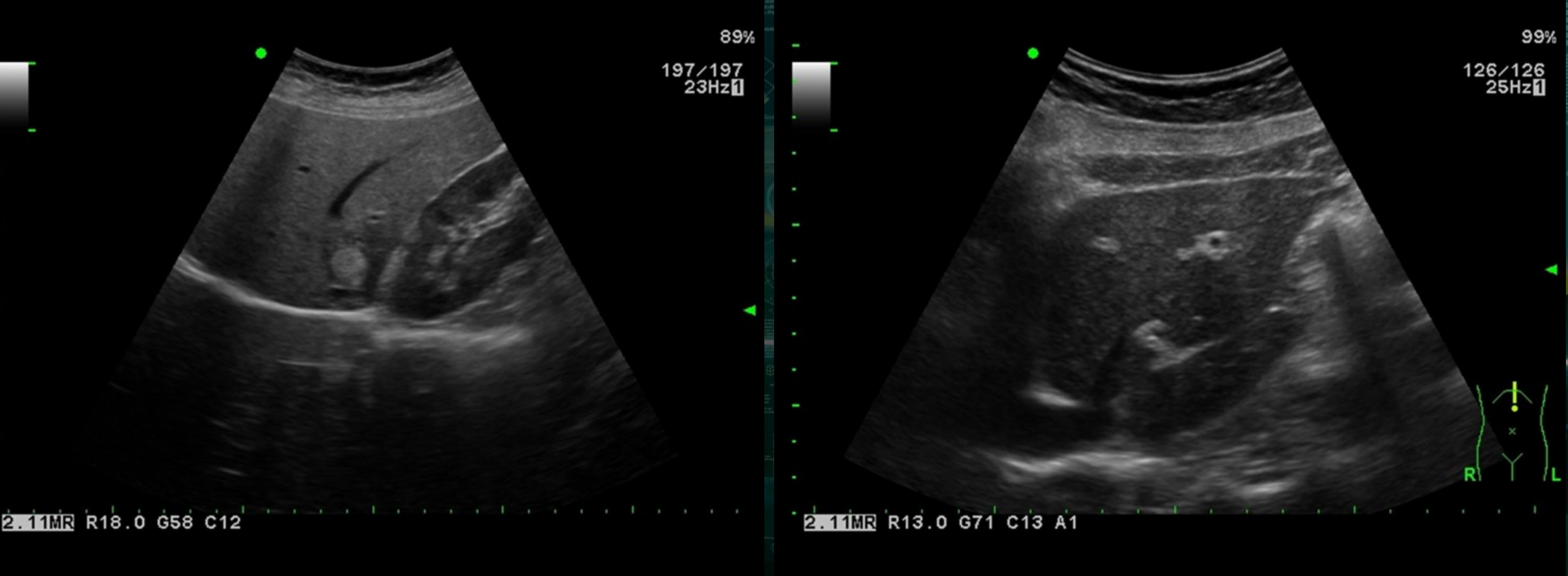
โครงการวิจัยโมเดลระบบบิเวศการเรียนรู้กับกระบวนการ CODING & AI สำหรับเยาวชน
Model of Learning Ecosystem Platform integrate with Coding & AI for Youth

ภาพคุณภาพดีเยี่ยม ที่เห็นชัดเจน ชัดเจน สวยงาม ทั้งหมด

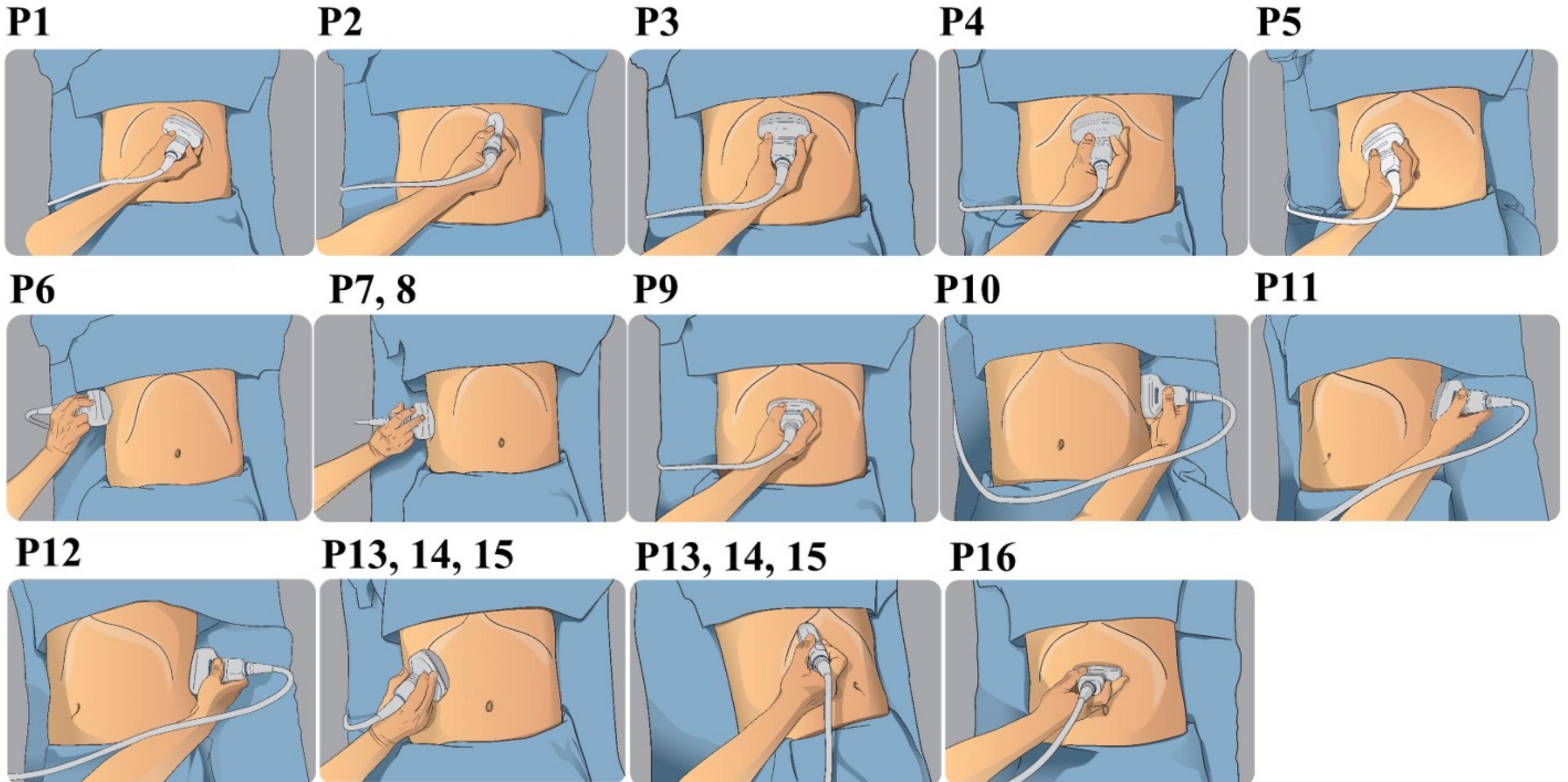
ซึ่งเป็นไปได้

1. ความต้องการที่มีอยู่ใน ชั้นเรียน สำหรับ

2. การนำไปใช้ใน การค่าทาง



Hand positions of 16 scanning positions



Naming - Metadata



14AB+Normal Classes

1. ชื่อไฟล์
↓
2. กรณีไฟล์ ให้ใส่ ตัวคลาส ก่อนหน้า

มุมมองของภาพ
Viewing angle

Classes

Patient case

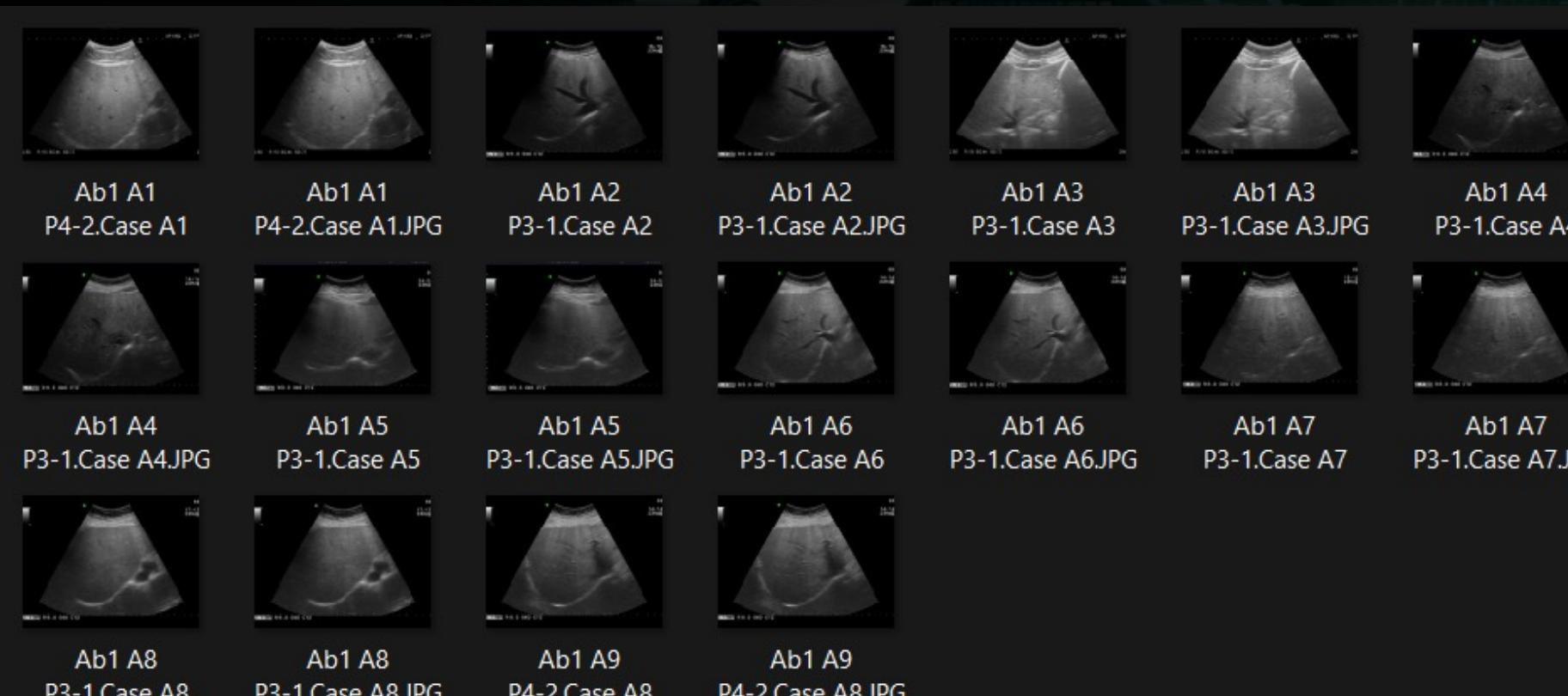
Ab1 A1 P4-2.Case A1.jpg

Ab1 A6 P3-1.Case A6.jpg

Ab1 A2 P3-1.Case A2.jpg

US Images name

Ab1 A9 P4-2.Case A8.jpg





ສໍາງເນື້ອ ດົກ
ເຂົ້າປະຕົວ ທັງລູກ Path

	Path Full	Sub Position	Sub_class	Case
	/media/tohn/HDD/VISION_dataset/USAI/ABnormal01...	P1	AB01	40
	/media/tohn/HDD/VISION_dataset/USAI/ABnormal01...	P2	AB01	40
	/media/tohn/HDD/VISION_dataset/USAI/ABnormal01...	P41	AB01	40
	/media/tohn/HDD/VISION_dataset/USAI/ABnormal01...	P51	AB01	40
	/media/tohn/HDD/VISION_dataset/USAI/ABnormal01...	P31	AB01	40

	/media/tohn/HDD/VISION_dataset/USAI/US images ...	P32	Normal	350
	/media/tohn/HDD/VISION_dataset/USAI/US images ...	P42	Normal	350
	/media/tohn/HDD/VISION_dataset/USAI/US images ...	P52	Normal	350
	/media/tohn/HDD/VISION_dataset/USAI/US images ...	P61	Normal	350
	/media/tohn/HDD/VISION_dataset/USAI/US images ...	P8	Normal	350



Path Full	Sub Position	Sub_class	Case
/media/tohn/HDD/VISION_dataset/USA1/ABnormal01...	P1	AB01	40
/media/tohn/HDD/VISION_dataset/USA1/ABnormal01...	P2	AB01	40
/media/tohn/HDD/VISION_dataset/USA1/ABnormal01...	P41	AB01	40
/media/tohn/HDD/VISION_dataset/USA1/ABnormal01...	P51	AB01	40
/media/tohn/HDD/VISION_dataset/USA1/ABnormal01...	P31	AB01	40
...
/media/tohn/HDD/VISION_dataset/USA1/US images ...	P32	Normal	350
/media/tohn/HDD/VISION_dataset/USA1/US images ...	P42	Normal	350
/media/tohn/HDD/VISION_dataset/USA1/US images ...	P52	Normal	350
/media/tohn/HDD/VISION_dataset/USA1/US images ...	P61	Normal	350
/media/tohn/HDD/VISION_dataset/USA1/US images ...	P8	Normal	350

66% กรณี 1000 ใช้ 10 fold

↑ Column

Column n

fold 66%

bg 25 test

Train /
Test

Fold



	Class	Case	US images count
Train	Abnormal	366	5,257
	Normal	289	
Test	Abnormal	91	1,312
	Normal	71	
	Total	817	6,569



Group ป ปั้น ก้าวหน้า อดีตยังคง 15 สุว ๕ ปี ๑๗๖๔ ๒๕๖๓ ๗ ๘๙๖๔

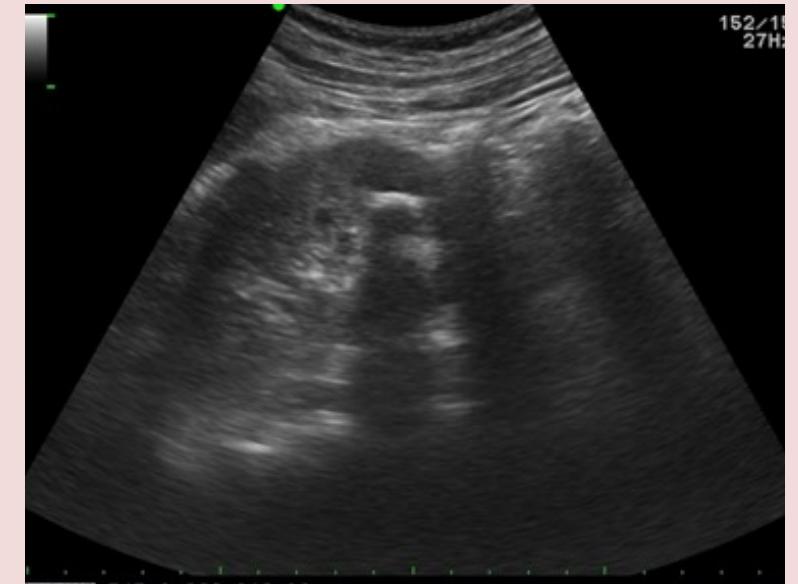
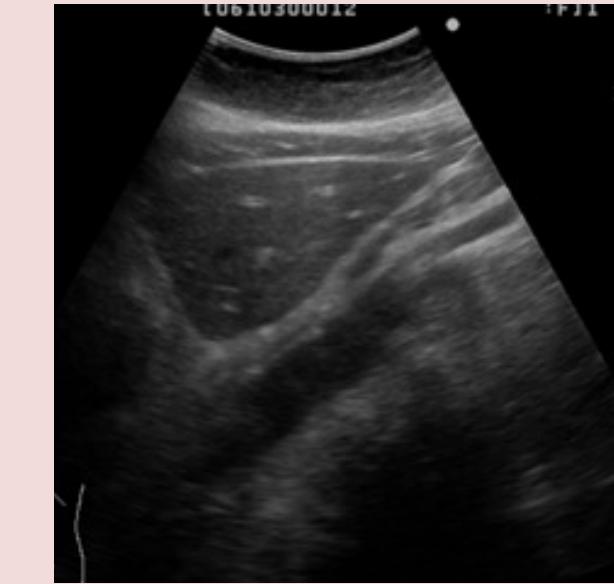
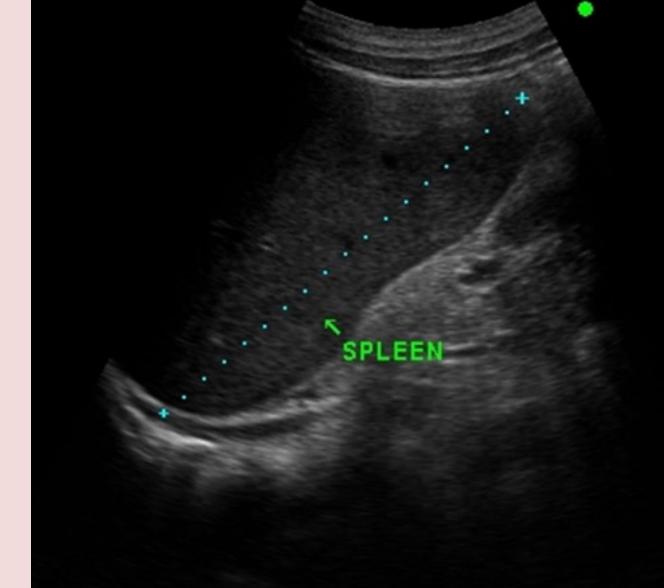
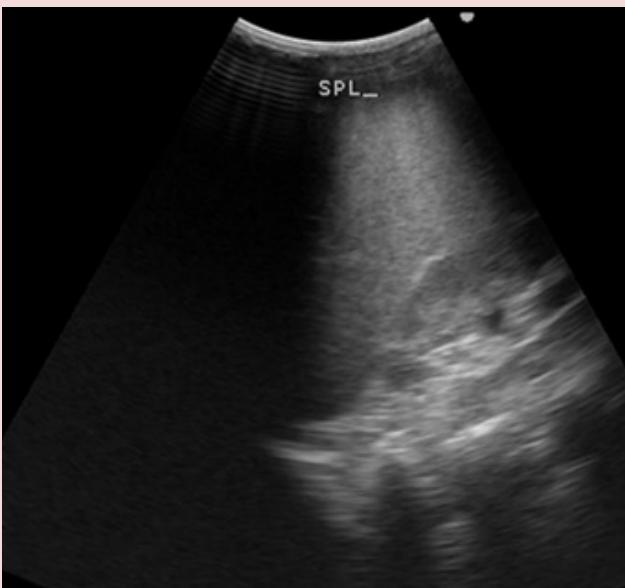
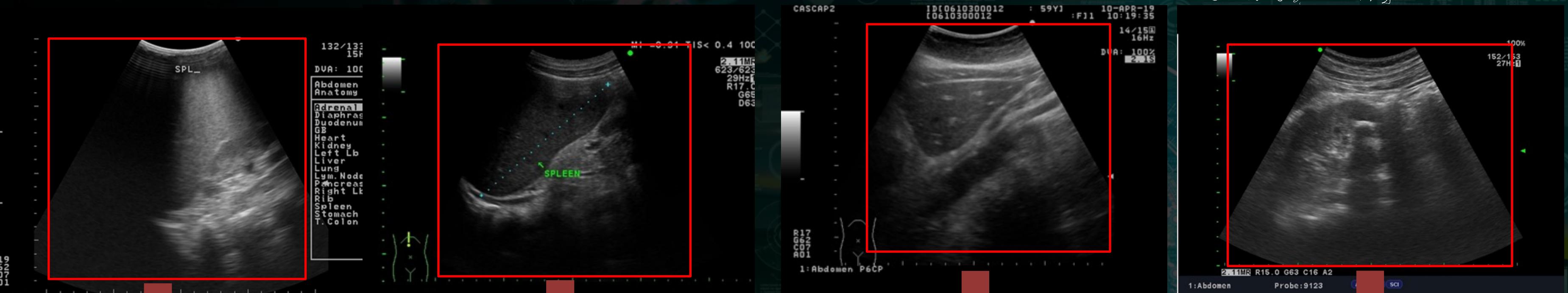
กัน

Class number	Label	FP-A	FP-B	FP-C	FP-D	FP-E	Total
1	AB01	105	164	100			369
2	AB02	128	123	77			328
3	AB03	53	31	24			108
4	AB04	105	46	46	3		200
5	AB05	44	78	5			127
6	AB06	76	9				85
7	AB07	3	67	25			95
8	AB081	27	72	57			156
9	AB082	32	56	49			137
10	AB083	11	27	16			54
11	AB09		2	122			124
12	AB10			53			53
13	AB11			73	203		276
14	AB12			1	165		166
Abnormal (Class number 1-14)		584	675	648	371	0	2,278
Normal (Class number 1-14)		748	1,329	1,261	605	348	4,291
Total		1,332	2,004	1,909	976	348	6,569

Remove BG Information

จะลองดูกันว่า หลัง model 1 ชั้น เต่าเอาไป ซึ่งในภาพ ต่อ ก็จะ

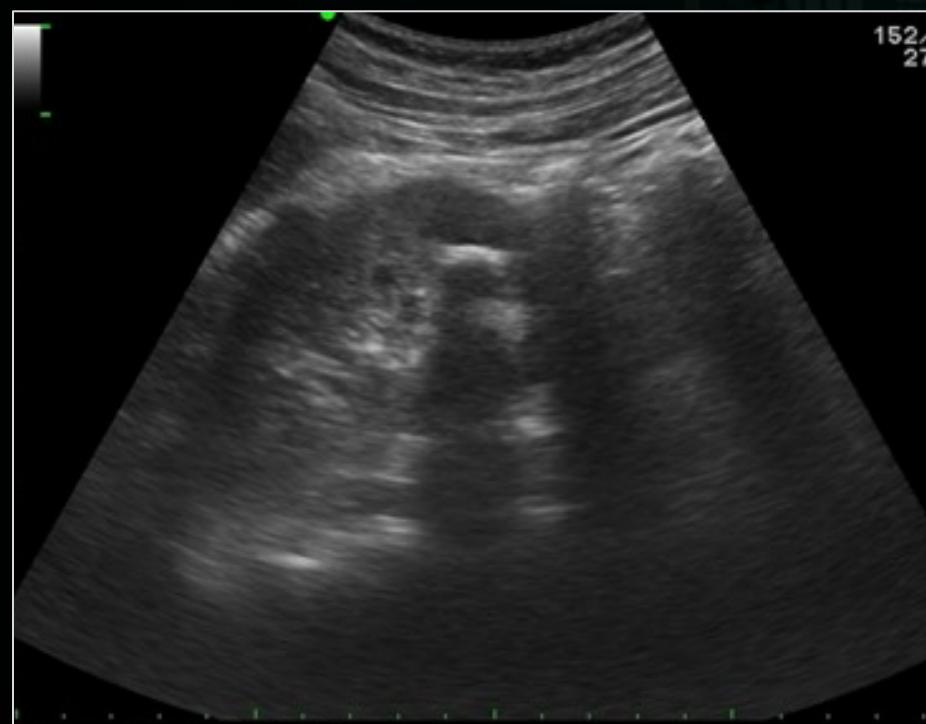
Ex: รูป 1 ตัว ดีเจนี่จะอยู่





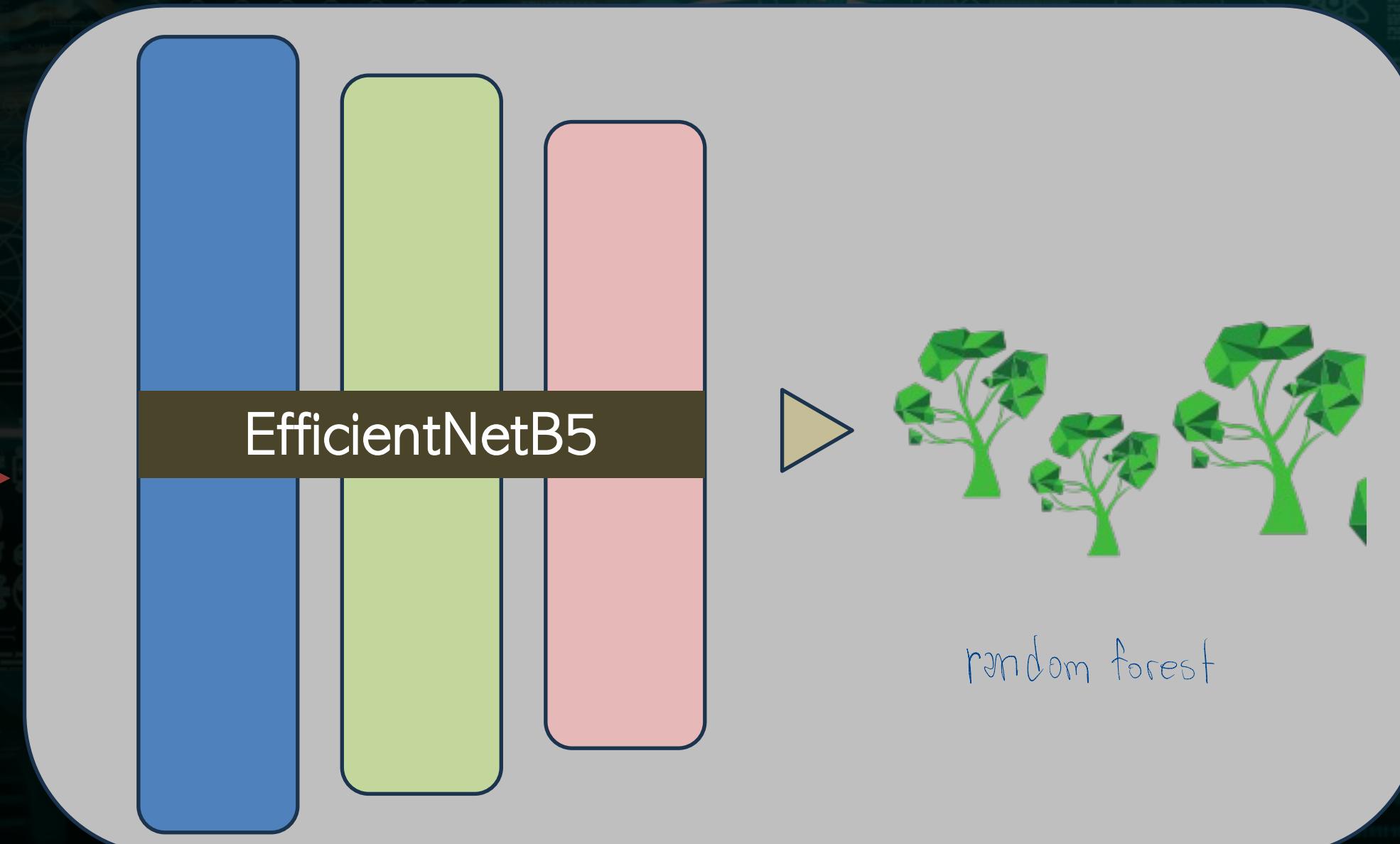
Input Size

Set input size 96 ตามทักษะ
EffNetB5

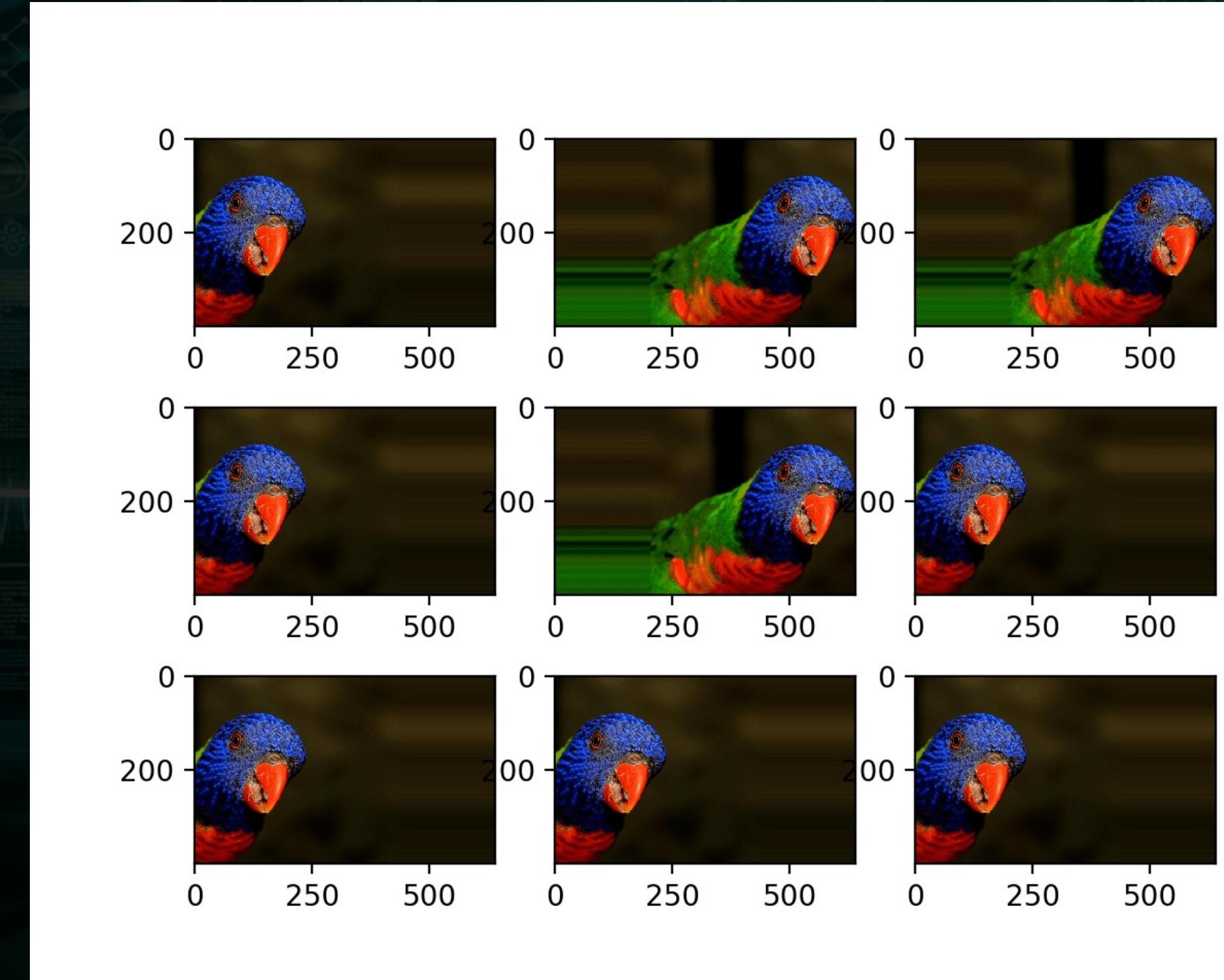


456x456x3

ก ค จ ล
↑
RGB



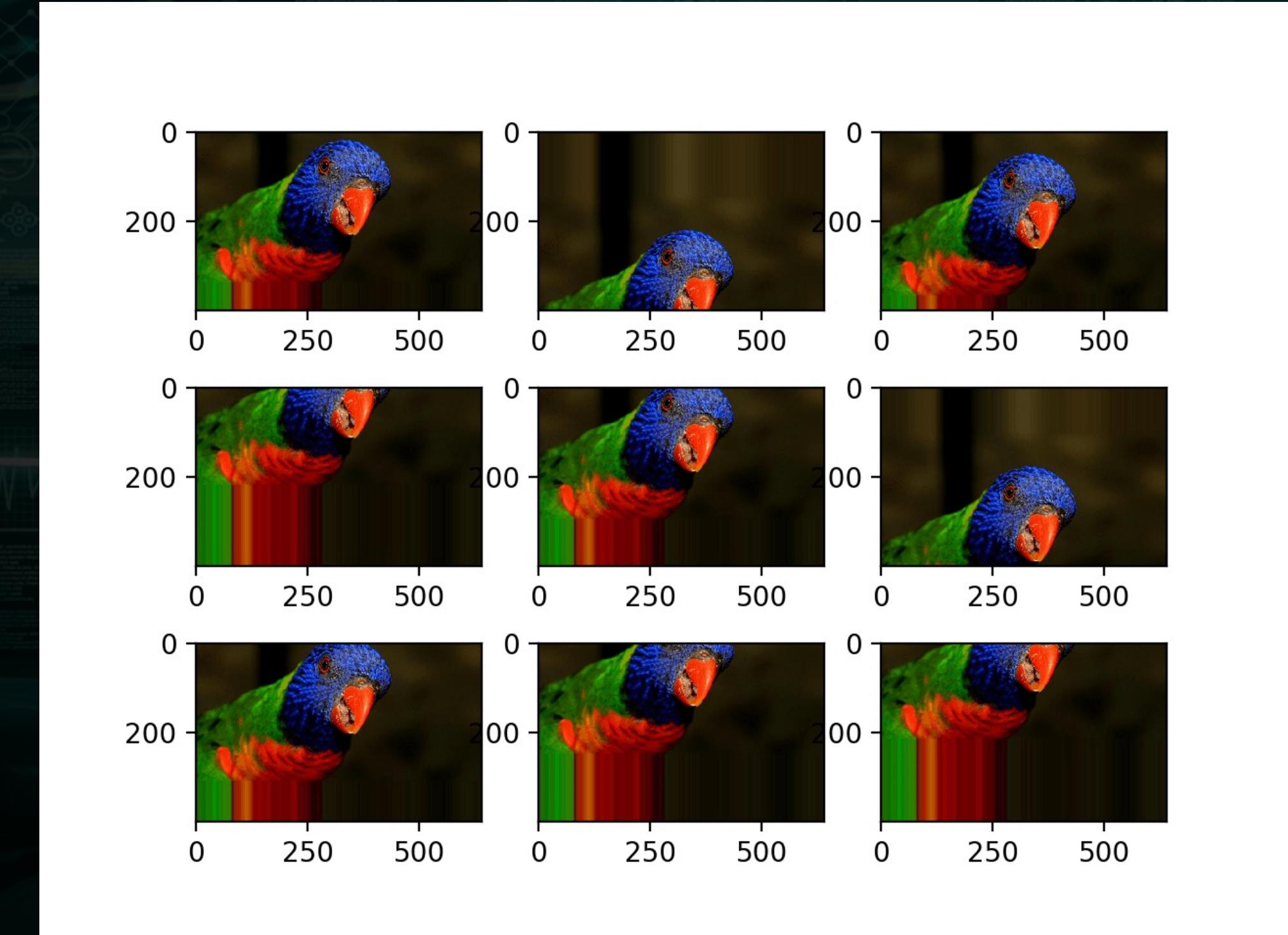
Data Augmentation



Horizontal Shift

: ก. เก็บข้อมูลในหน้าจอ เนื้อคุณ ๒, ๑

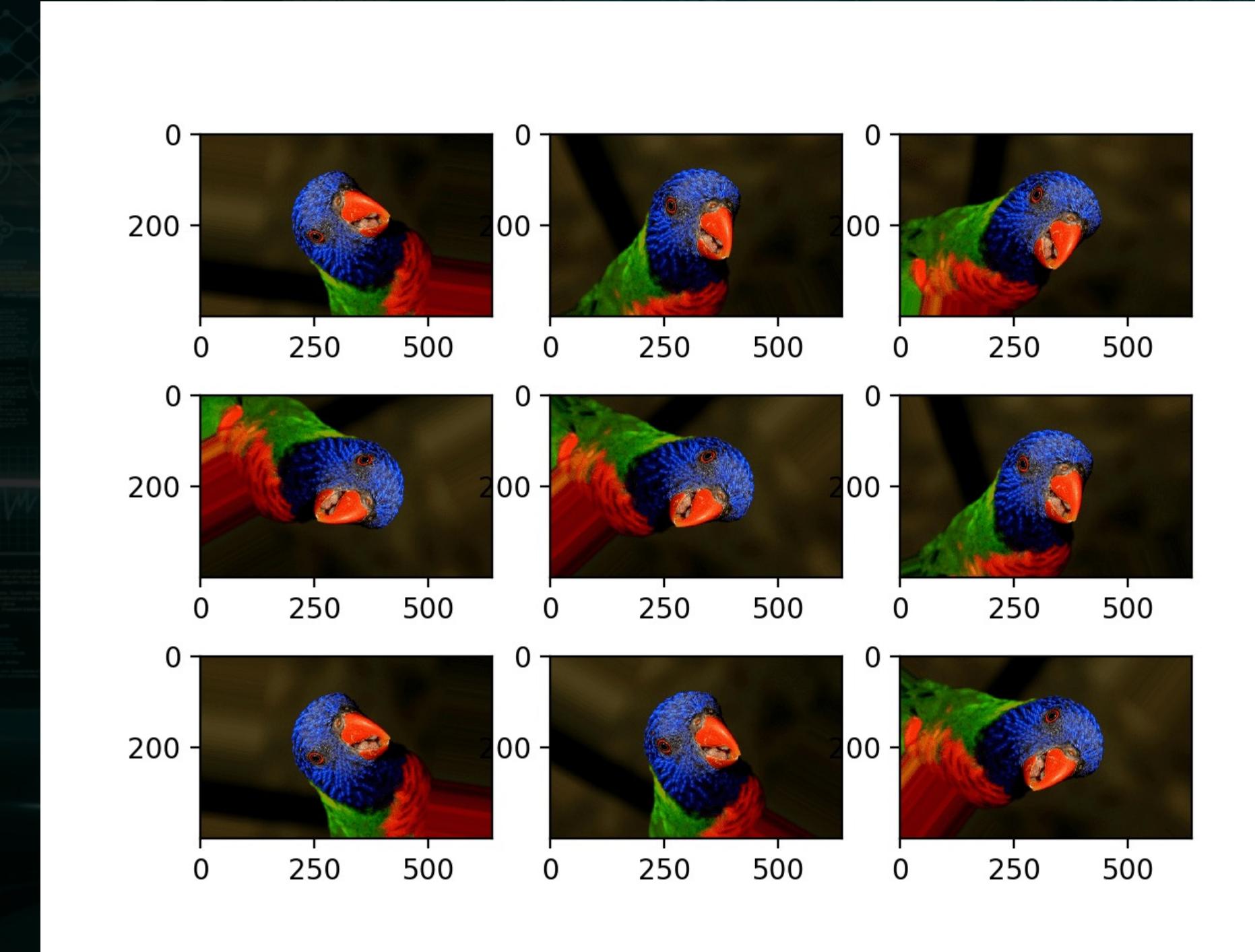
Data Augmentation



Vertical Shift

ชั้น, กว

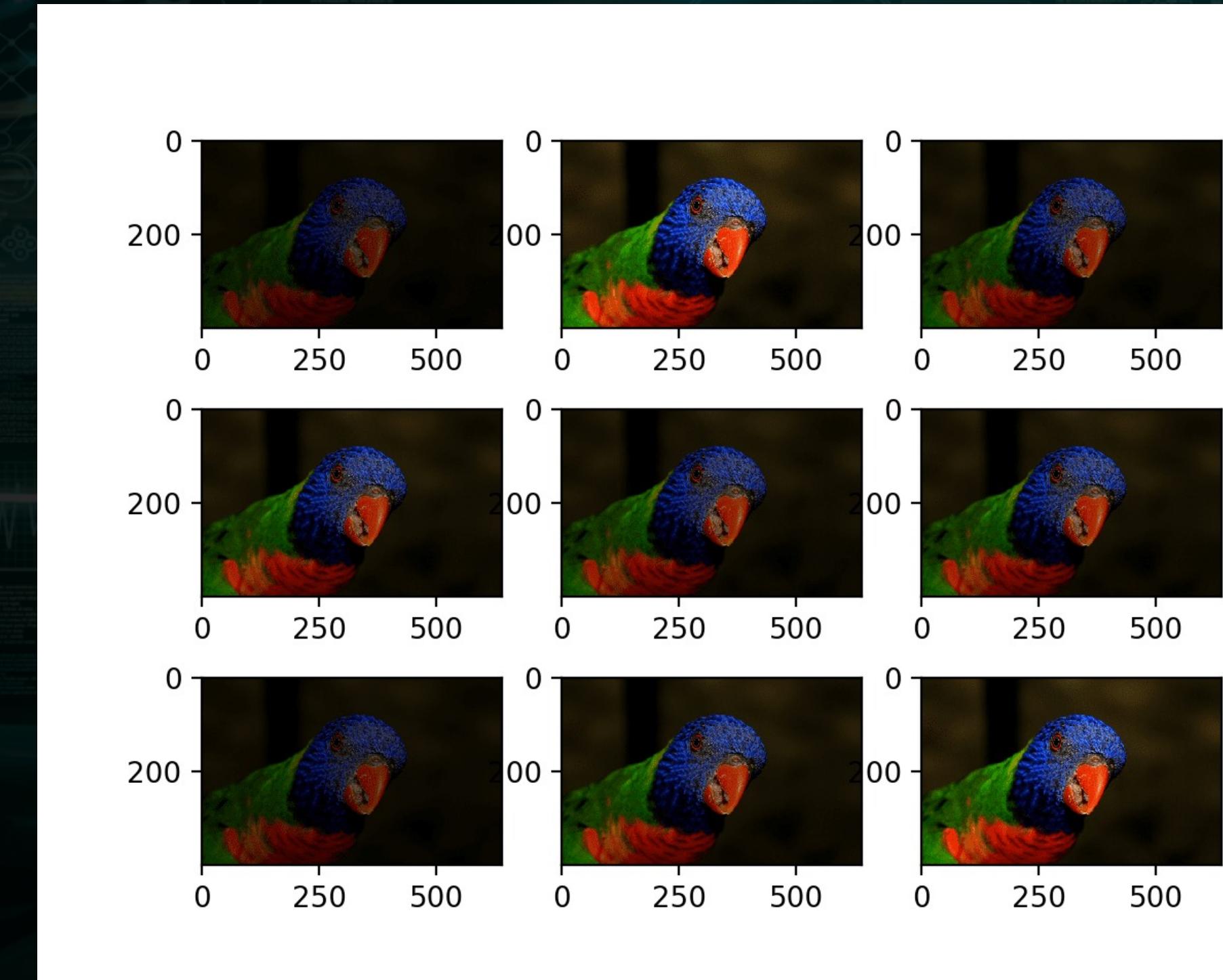
Data Augmentation



Rotation 30°

ឧខ្ពស់ ថ្ងៃ ការ និង ទី ៣០

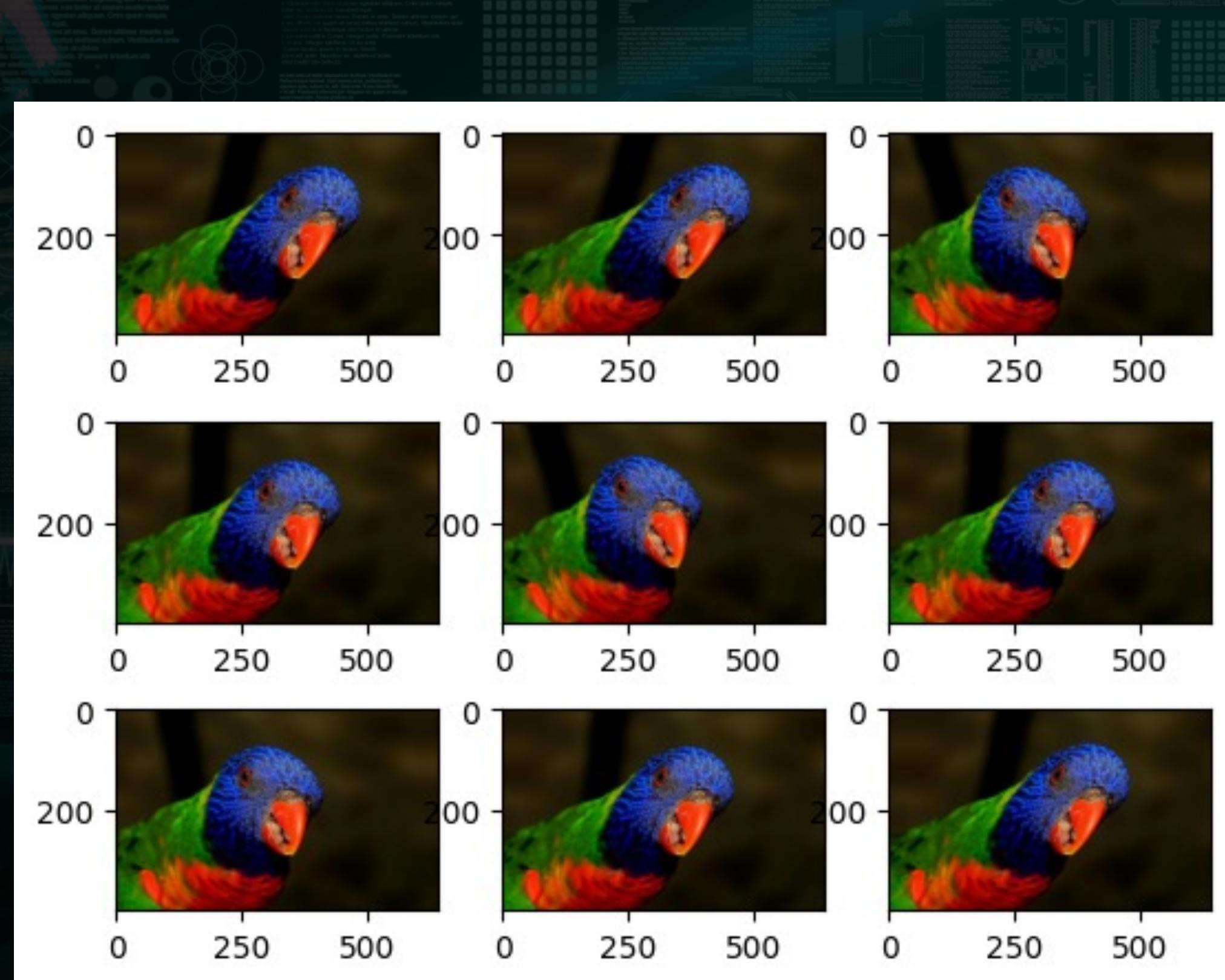
Data Augmentation



Bright

ค. ๘๗๖ ๙๐๑ ๓๙

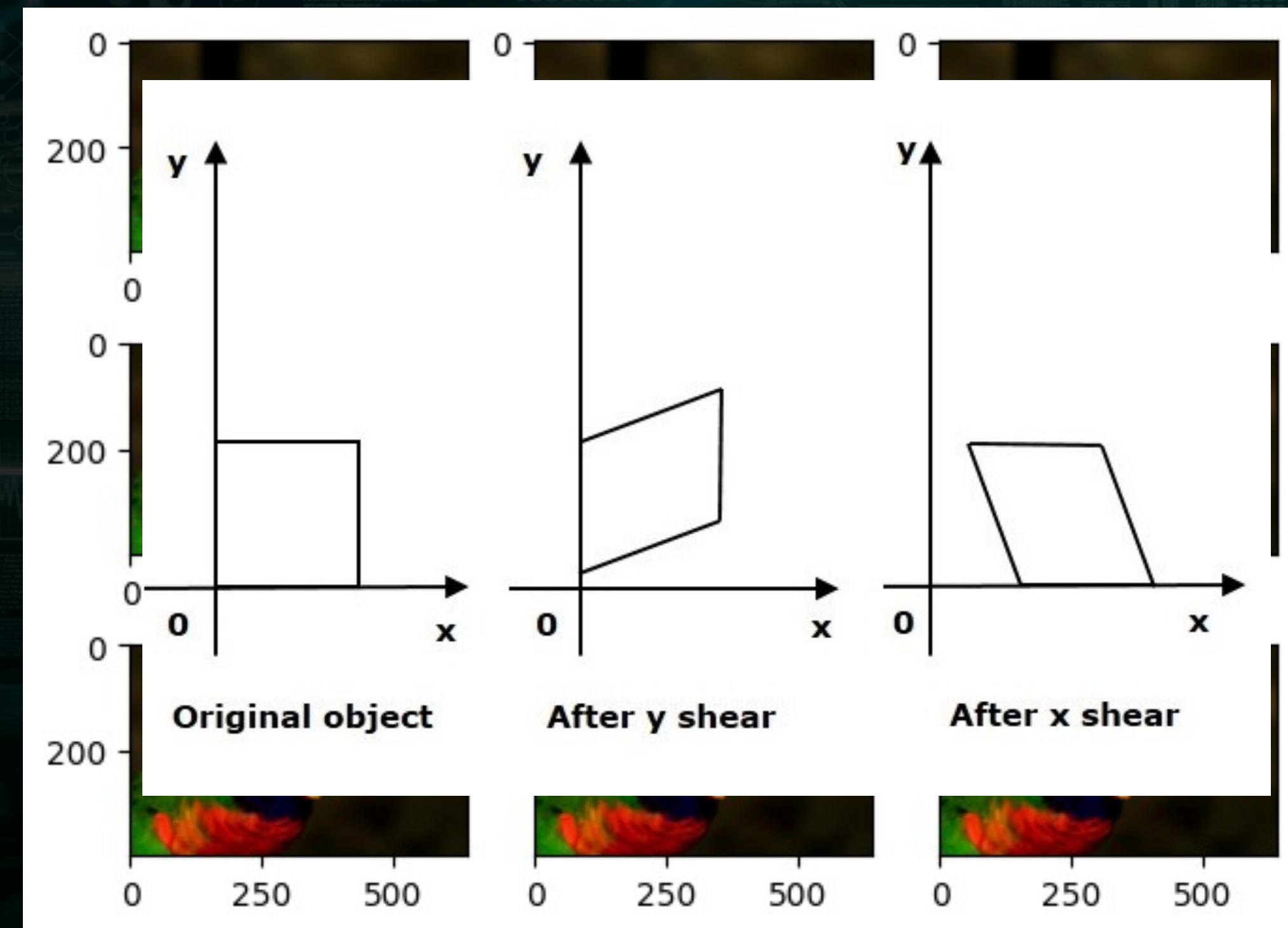
Data Augmentation



Shear

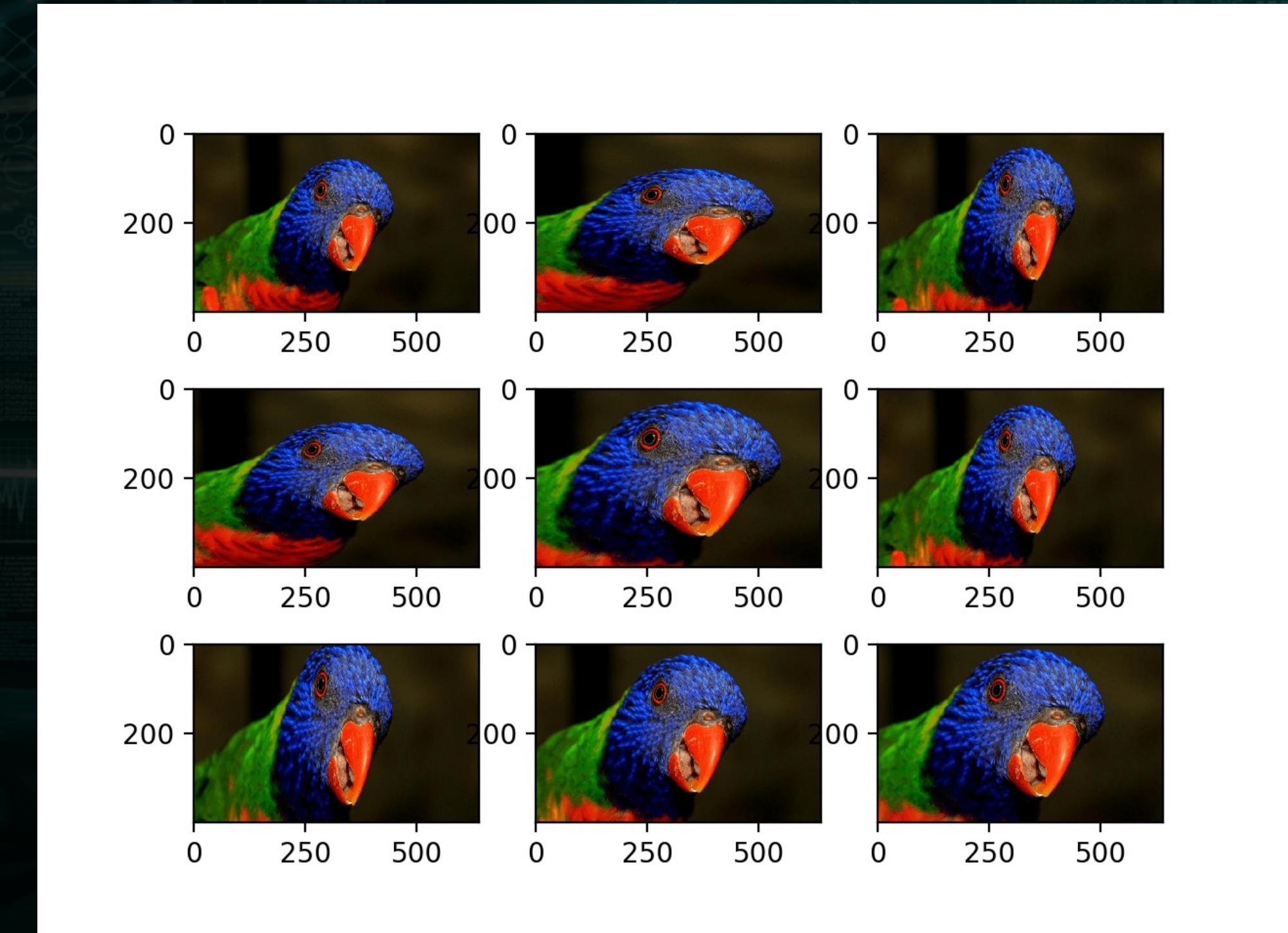
ก. เลื่อนช่วง 10 ภาพ

Data Augmentation



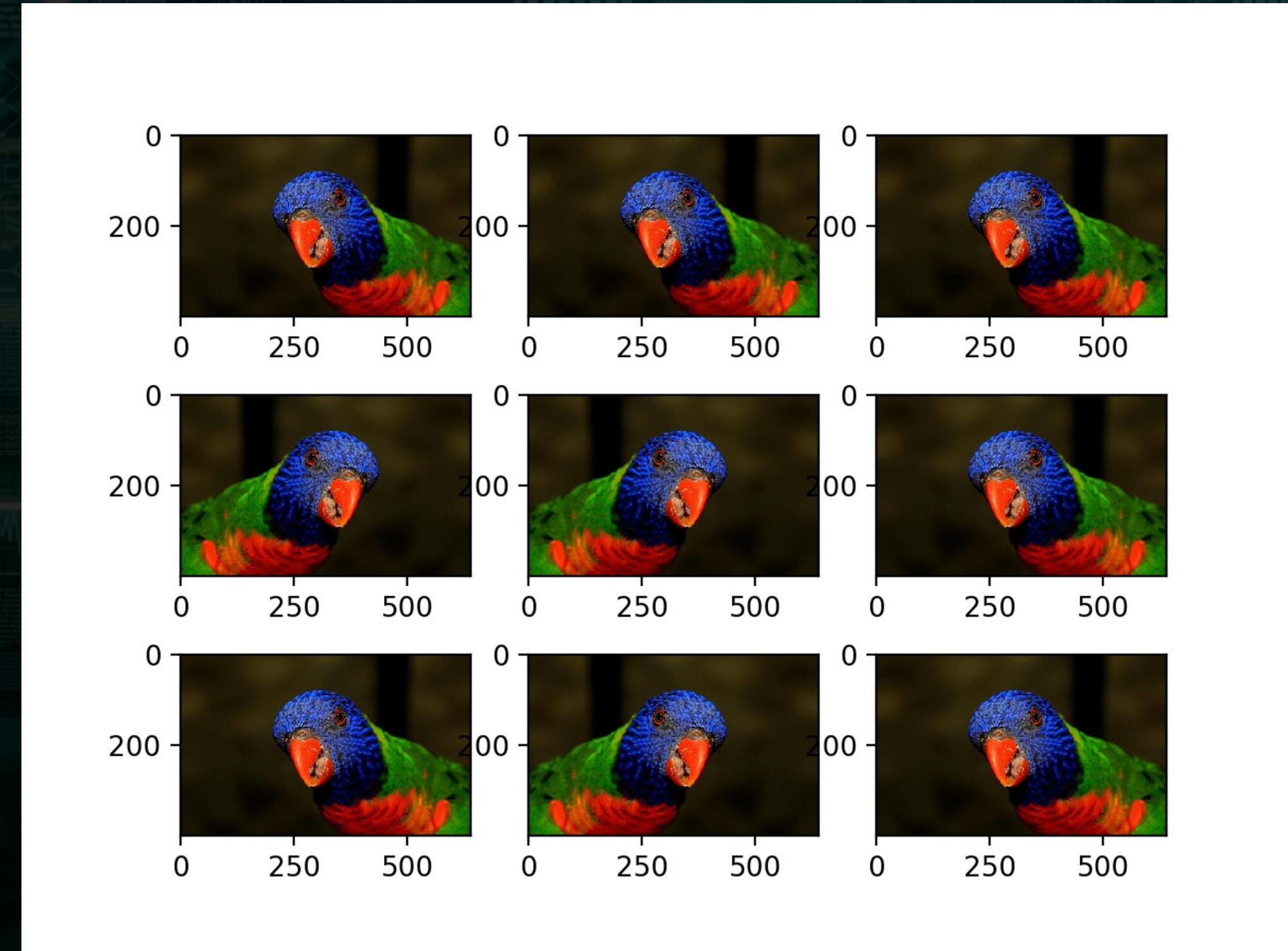
Shear

Data Augmentation



Zoom

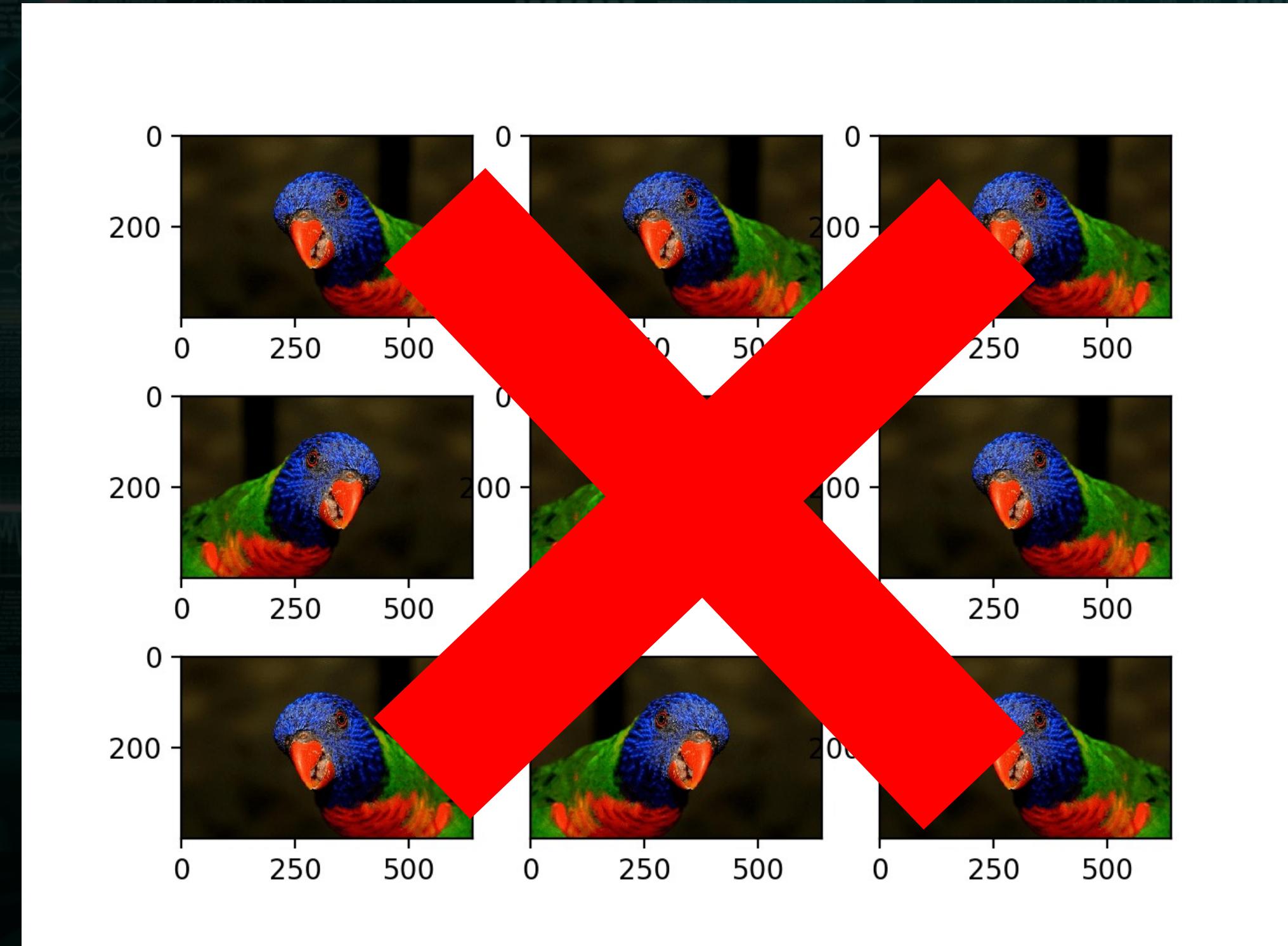
Data Augmentation



No Flip

กํง ๗๖ ๒๕๖๘ ๑๙๗๙ พด ๑๐๙ ๑๖๔ ๒๕๖๘ ๐๙ ๒๕๖๘

Data Augmentation



No Flip



Data Augmentation

<https://machinelearningmastery.com/how-to-configure-image-data-augmentation-when-training-deep-learning-neural-networks/>

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How to Configure Image Data Augmentation in Keras

by Jason Brownlee on July 5, 2019 in Deep Learning for Computer Vision  237

 Welcome!
I'm Jason Brownlee PhD and I help developers get results with machine learning.
[Read more](#)



Image data augmentation is a technique that can be used to artificially expand the size of a training dataset by creating modified versions of images in the dataset.

Training deep learning neural network models on more data can result in more skillful models, and the augmentation techniques can create variations of the images that can improve the ability of the fit models to generalize what they have learned to new images.

The Keras deep learning neural network library provides the capability to fit models using image data augmentation via the *ImageDataGenerator* class.

In this tutorial, you will discover how to use image data augmentation when training deep learning neural networks.

```
1 # example of horizontal shift image augmentation
2 from numpy import expand_dims
3 from keras.preprocessing.image import load_img
4 from keras.preprocessing.image import img_to_array
5 from keras.preprocessing.image import ImageDataGenerator
6 from matplotlib import pyplot
7 # load the image
8 img = load_img('bird.jpg')
9 # convert to numpy array
10 data = img_to_array(img)
11 # expand dimension to one sample
12 samples = expand_dims(data, 0)
13 # create image data augmentation generator
14 datagen = ImageDataGenerator(width_shift_range=[-200,200])
15 # prepare iterator
16 it = datagen.flow(samples, batch_size=1)
17 # generate samples and plot
18 for i in range(9):
19     # define subplot
20     pyplot.subplot(330 + 1 + i)
21     # generate batch of images
22     batch = it.next()
23     # convert to unsigned integers for viewing
24     image = batch[0].astype('uint8')
25     # plot raw pixel data
26     pyplot.imshow(image)
27     # show the figure
28 pyplot.show()
```

