



LEGO minifigure AI engine

THE PROJECT YODA DREAM TEAM



Jakob STEININGER(**Master Yoda**): PASS ON WHAT YOU HAVE LEARNED.



Daniel WENDEL(**Spiderman**): WITH GREAT POWER COMES GREAT RESPONSIBILITY.



Hicham ZERMANE(**Harry Potter**): WE ARE ONLY AS STRONG AS WE ARE UNITED.



Yiping ZHANG(**Black Widow**): YOU GET TO MAKE YOUR OWN CHOICES NOW.

THE BACKGROUND: our passion for LEGO



THE DATASET: LEGO minifigures

Data Explorer

29.09 MB

- harry-potter
 - 0001
 - 0002
- jurassic-world
 - 0001
 - 0002
- marvel
- star-wars
 - 0001
 - ❑ 001.jpg
 - ❑ 002.jpg
 - ❑ 003.jpg
 - ❑ 004.jpg
 - ❑ 005.jpg
 - ❑ 006.jpg
 - ❑ 007.jpg
 - ❑ 008.jpg
 - ❑ 009.jpg
 - ❑ 010.jpg
 - ❑ 011.jpg
 - ❑ 012.jpg

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001.jpg
78.85 kB

002.jpg
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003.jpg
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64.82 kB

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012.jpg
29.94 kB

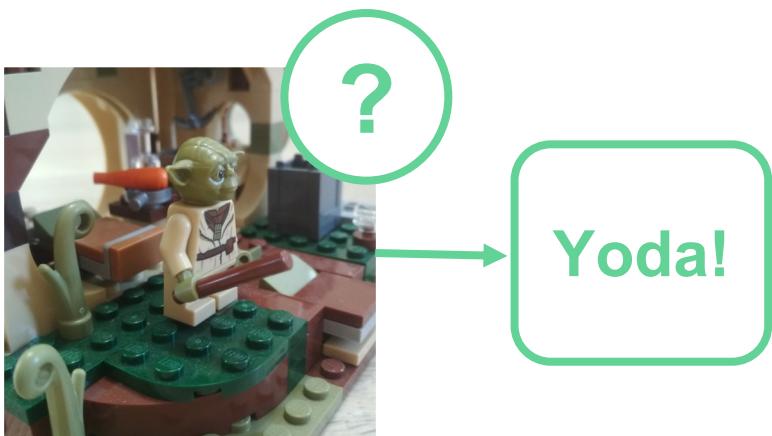
Size matters not. Look at me. Judge me by my size, do you? Hmm..



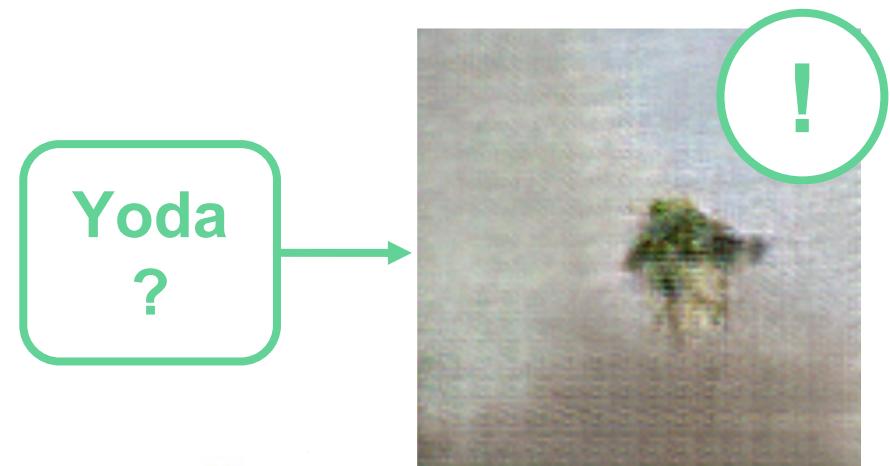
- Kaggle dataset
- ~500 images
- ~40 classes, i.e. LEGO minifigures

THE OBJECTIVE: image classification and generation

1. Image classification



2. Image generation



Try not. Do. Or do not. There is no try.

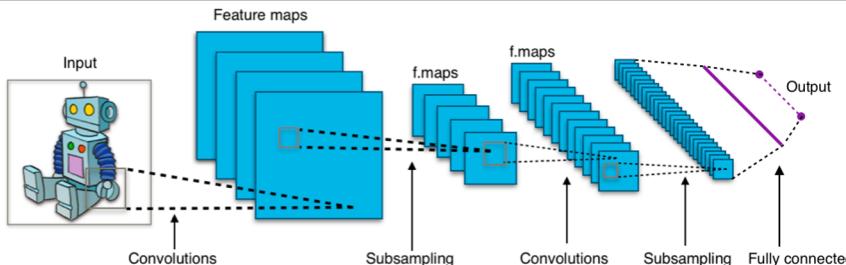


THE TOOLS: deep learning algorithms

You must unlearn what you have learned.

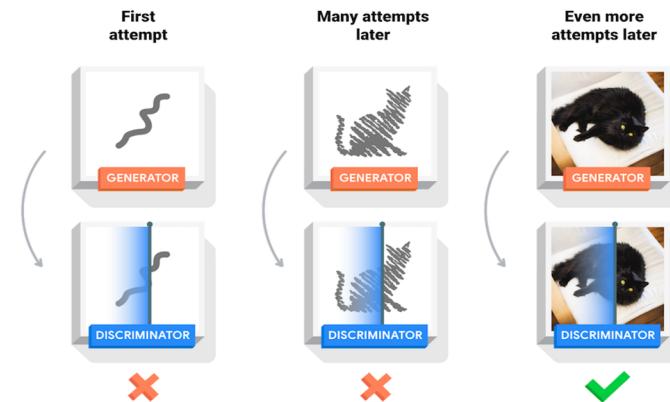


1. Convolutional neural network (CNN)

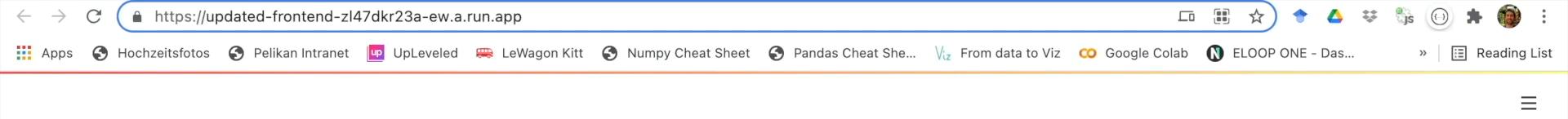


Classification

2. Generative adversarial network (GAN)



Generation



Project Yoda

Choose a file

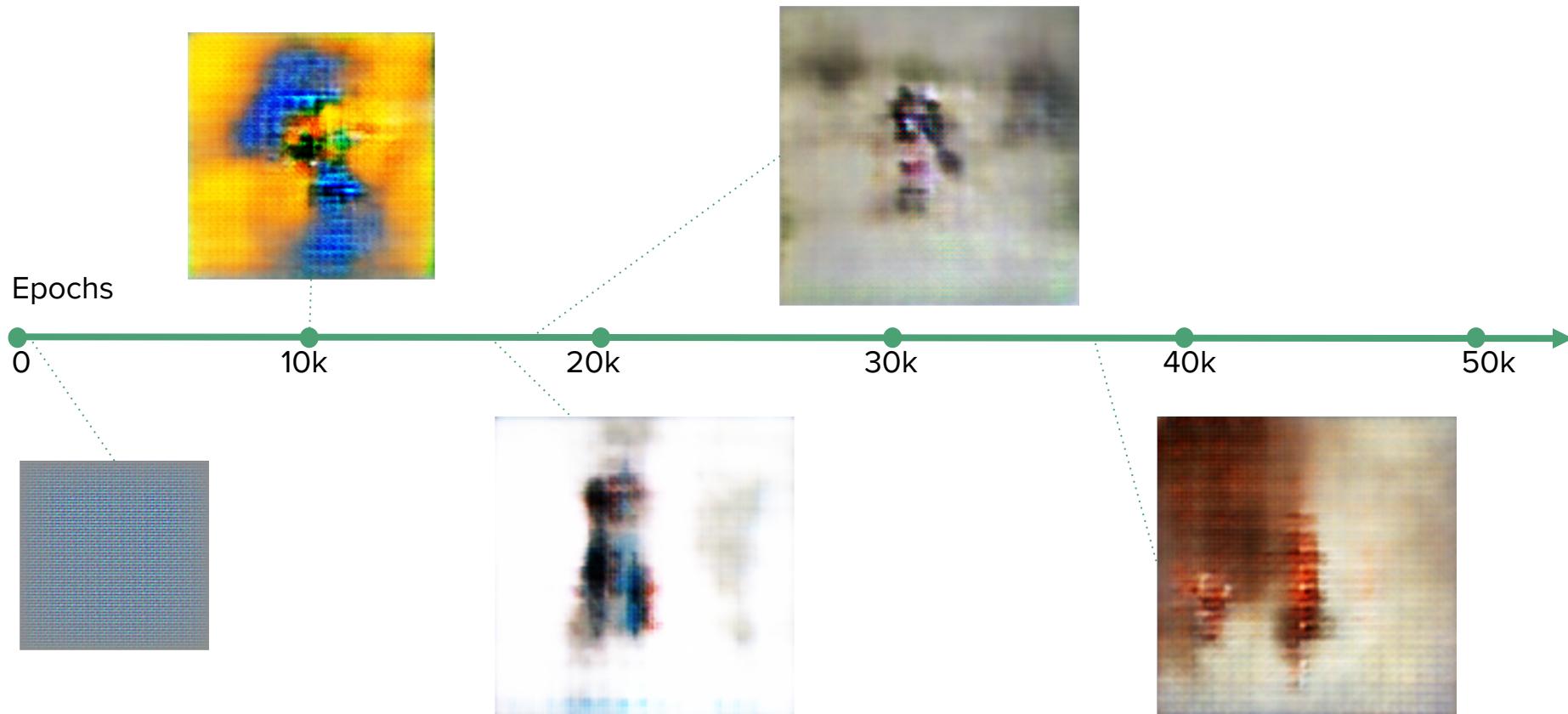
 Drag and drop file here

Limit 200MB per file • JPG, PNG

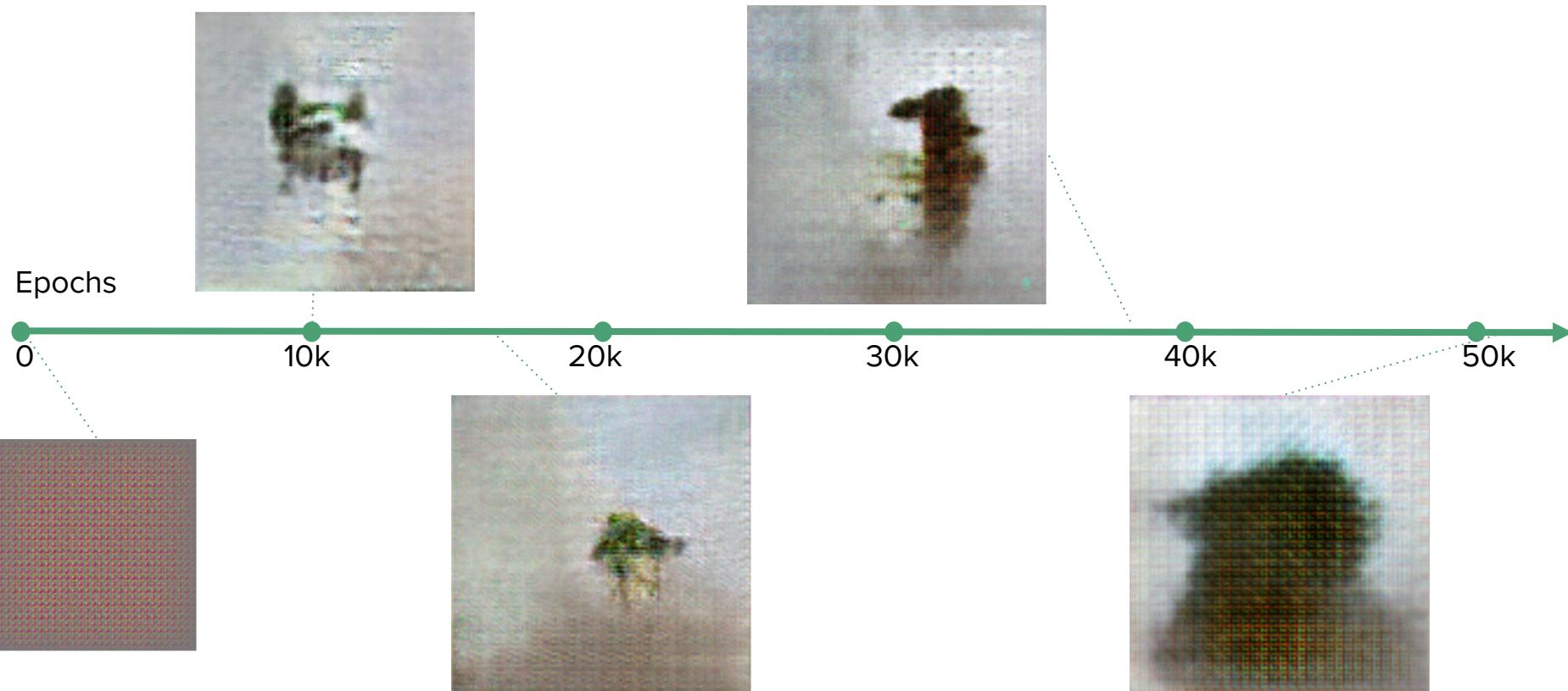


Scan this QR code to try out our application!

2. IMAGE GENERATION: entire dataset



2. IMAGE GENERATION: yoda only



ACHIEVEMENTS & LEARNINGS

1. Image classification

- Great **accuracy** of >95% thanks to transfer learning
- **Generalizable** even to non-LEGO



*Computing power
important is!*

2. Image generation

Reasonable results given available time and computing power...

...BUT really good results require

- lots of **computing power**
- lots of **time**
- lots of **training images**

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May the computing power be with you