Breaking Captchas

Using Deep Learning to Recognize Captchas in Tensorflow

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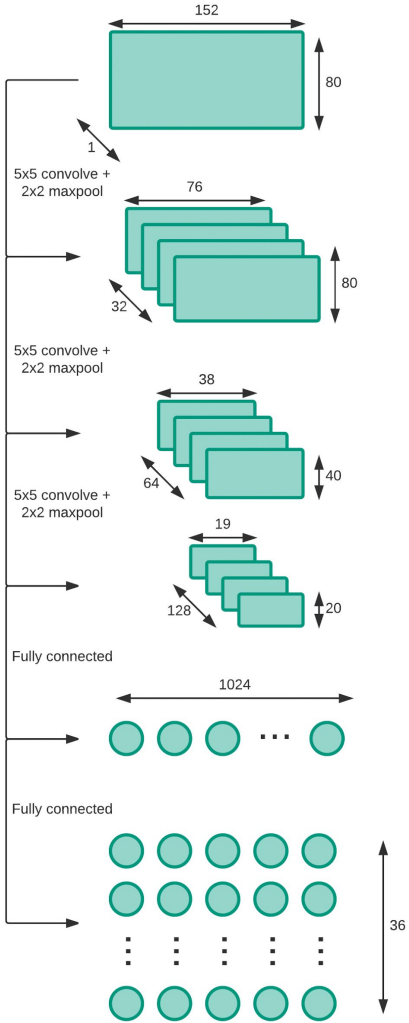
Problem statement

- CAPTCHA: **C**ompletely **A**utomated **P**ublic **T**uring test to tell **C**omputers and **H**umans **A**part
- Recognizing characters is easy for humans, but not machines
- Potentially circumvent CAPTCHAs through
  - Cheap human labor (around 0.13$ per CAPTCHA)
  - Insecure implementation
  - **Machine learning**

Our approach

Generate dataset



- Three convolutional layers
- Two fully connected layers
- ReLU activation function
- Dropout of 0.75

Examples

Correct

	Predicted: **54563**
	Predicted: **grh56**
	Predicted: **fb2x4**

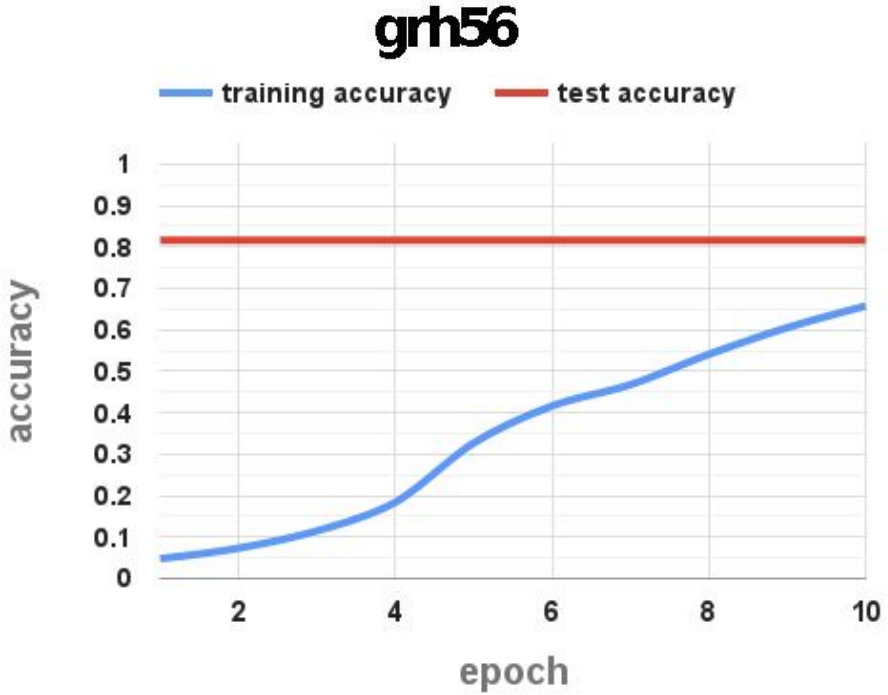
Incorrect

	Predicted: **82298**
	Predicted: **k76ap**
	Predicted: **fffgr**

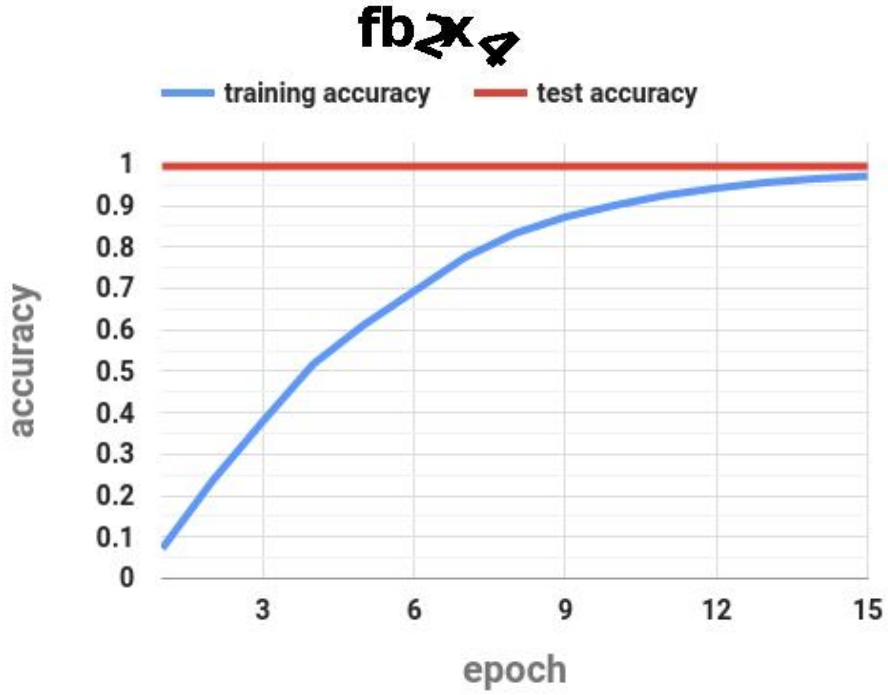
Demo

Results

Training on 49750 images with 10 epochs and 199 batches on a Tesla K80.



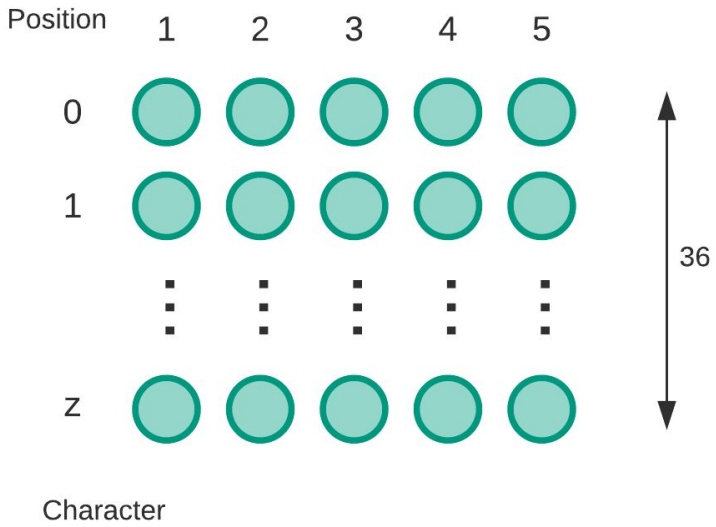
Training on 196926 images with 15 epochs and 787 batches with size 100 on a Tesla K80.



Questions?

Check our detailed report:
https://github.com/tharidu/breakingcaptcha/blob/master/report/CAPTCHA-report.md

Output layer encoding



Current state of research

- Preprocessing, segmentation, and KNN
- Preprocessing, segmentation, and CNNs
- CNNs
- RNNs
- ...