MODELLING FONTS WITH CONVOLUTIONAL NEURAL NETWORKS

Onderzoeksvoorstel

Philip Bouman

26 april 2017

Universiteit van Amsterdam

RESEARCH QUESTION

- Institute for Logic, Language and Computation (ILLC)
- 1. classify characters of different writing systems
  - for example:

- 2. investigate feature representations learned by the network

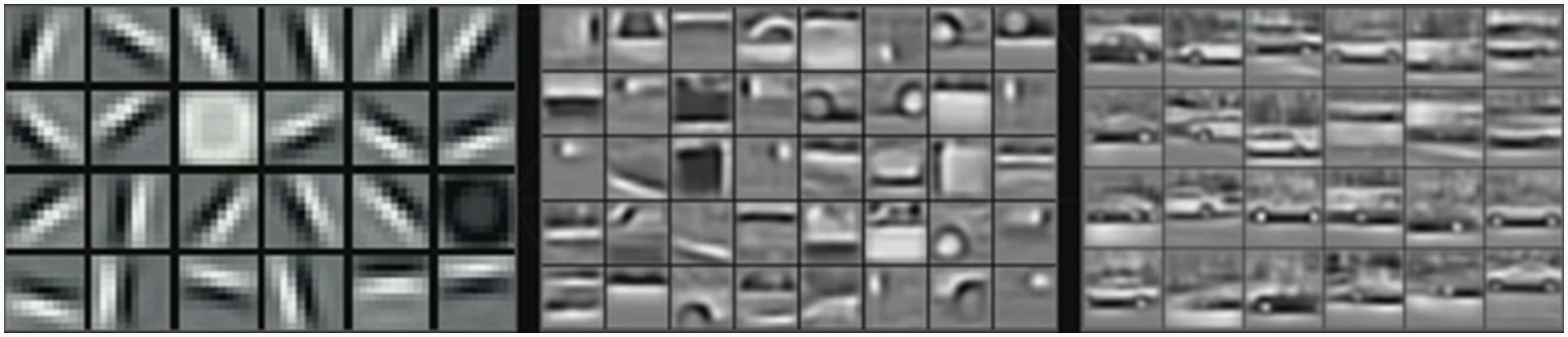
METHOD

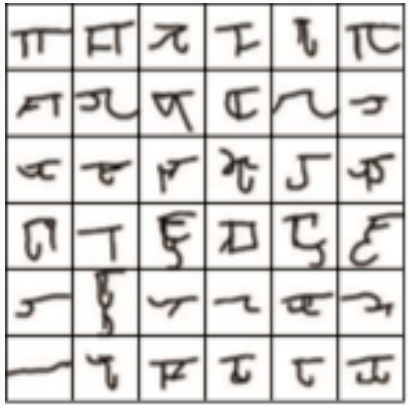
- convolutional neural network
  - better results than previous state of the art methods
  - image classification
  - handwritten character recognition
- depending on available data:
  - supervised, using phoneme relations
  - unsupervised

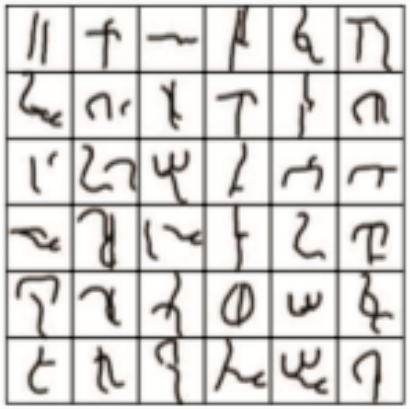
Language	Type	Population	p	b	m	f	v	t	d	ts	s	z	n	l	tʃ	dʒ
Hebrew	Abjad	6	פ	ב	מ	פ	ב, ו	ת, ט	ד	צ	ס, ש	ז	נ	ל	צ', תש	ג'
Tifinagh	Abjad	1	ⵆ	ⵒ,ⵀ	ⵎ	ⵅ	ⵄ	ⵜ	ⵔ		ⵙ	ⵣ	ⵏ	ⵍ	ⵛ	ⵊ,ⵊ
Syriac	Abjad	0,4	ܦ	ܒ	ܡ	ܦ	ܒ	ܛ	ܕ		ܣ	ܙ	ܢ	ܠ		
Arabic	Abjad	660		ب	م	ف		ت	د		س	ز	ن	ل		
Devanagari	Abugida	420	प	ब	म						स			ल	च	ज
Bengali	Abugida	220	প	ব	ম			ট	ড		চ		ঞ	ল		জ

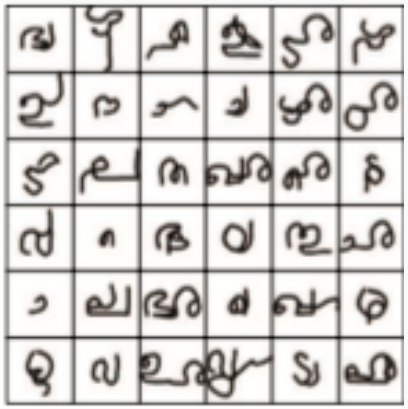
EVALUATION

- investigate and visualize features learned by the network
- compare results to other image reconition networks
- compare results supervised/unsupervised method









PLAN

- collect data/ extend dataset
- convert fonts (.ttf/.otf) to images (PNG, JPEG)
- (optional) extract features (OpenCV)
- create network architecture (Keras; Tensorflow, Theano)
- train network on data (training, test set)
- investigate effect of different layers/ stacks
- visualize and evaluate results