

# VISUAL SEARCH & DATA SCIENCE ON STYRIA'S CLASSIFIEDS

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Styria Digital Services

ONE SPIRIT,  
UNLIMITED IDEAS

# THE REGIONAL PUBLISHER



(STYRIA)

(STYRIA)



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ZEITUNG

SPORT  
MAGAZIN

Business  
People

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DIE FURCHE

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Poslovni dnevnik

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Večernji  
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Express

24  
SATA



PIXSELL  
CONTENT ENGINE

3 classifieds - market leaders

(STYRIA)  
SCHIBSTED  
MEDIA GROUP

WILLHABEN

njuškalo  
GLAVNA NJUŠKA MEĐU OGЛАСНИЦАМА

bolha.com  
mali oglasi, velike priložnosti

MojeDelo.com

wo?  
gibt's  
was?

# DATA SCIENCE TEAM

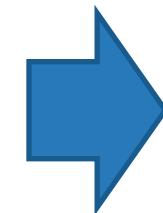
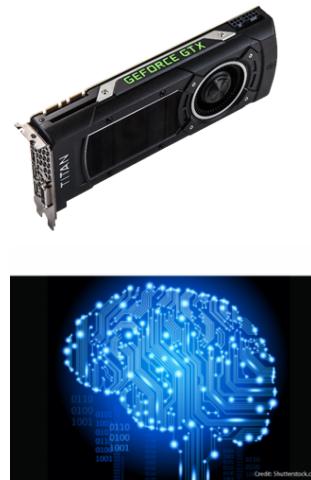
(STYRIA

- 8 data scientists and programmers
- Initiative from 2014, team formed in 2015
- Machine learning experts:  
Computer Vision and Natural Language Processing



# WHAT DO WE DO?

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Value !

Data:

- text
- images
- users

- Computing resources
- Machine learning expertise

# TECH. THAT MAKES THE DIFFERENCE

SYRIA

- Machine Learning (Deep Neural Networks)
- Program is not explicitly programmed, but the solution is learned from the data
- R&D

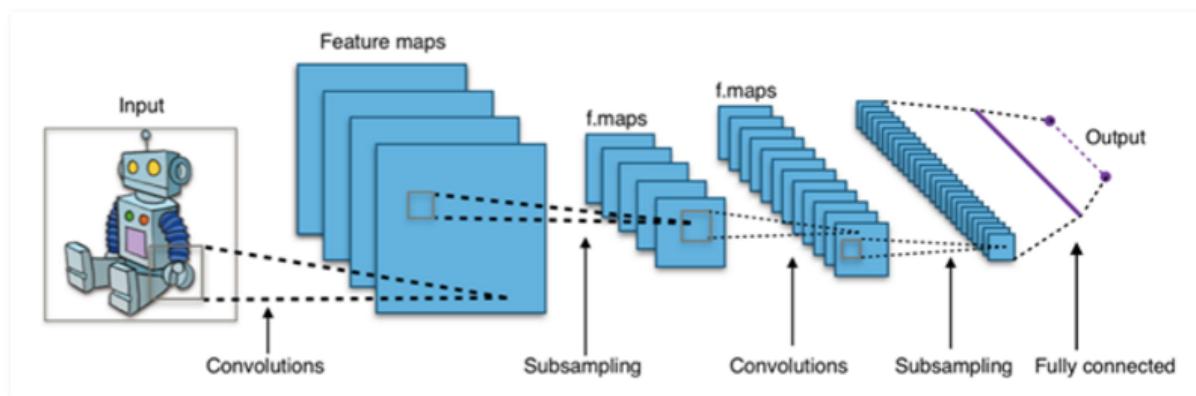


Figure 1: Typical architecture of a Convolutional Neural Network. Source: Aphex34 (Own work) CC BY-SA 4.0, from [Wikimedia Commons](#)

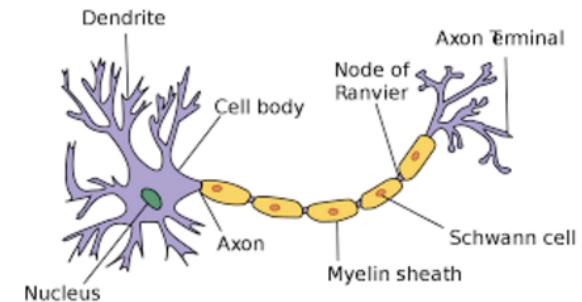
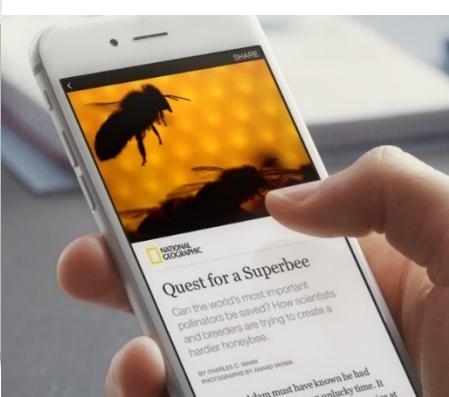
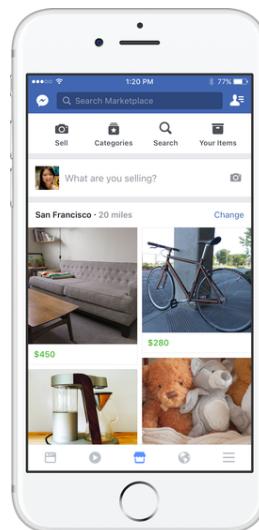


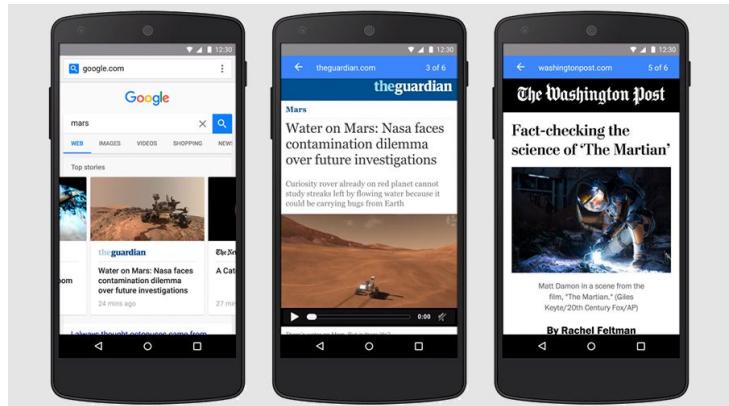
Figure 2: Wikipedia

# COMPETITION?

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# Google



# amazon

# IS IT THE GAME FOR A PUBLISHER OR A CLASSIFIED?

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- specific dataset and classification needs
- small and agile (internal) team
- understand your data

→ We can compete with the biggest players!

# VALUE FOR THE CUSTOMER

(STYRIA

Seller's side	Buyer's side
<p><b>Goal</b> - easy &amp; fast ad placement</p> <p><b>How</b></p> <ul style="list-style-type: none"><li>- automatically categorise user's ad</li><li>- take the photo → we do the rest</li></ul>	<p><b>Goal</b> - finding visually similar images</p> <p><b>How</b></p> <ul style="list-style-type: none"><li>- recognise what is in the image</li><li>- find similar</li></ul>

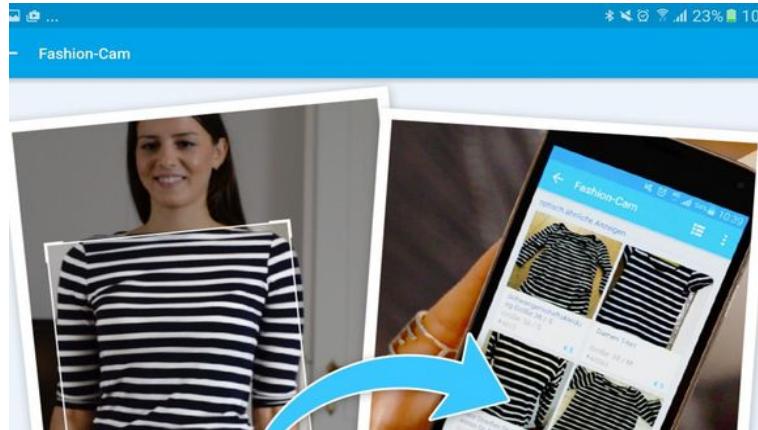
# SPECIFICALLY DEVELOPED FOR CLASSIFIEDS

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- Own data used for training the models
- Integrated to keep the data synced
- Visually–Semanticity tradeoff for fine-tuning



# WILLHABEN APP (IOS & ANDROID) & MOBILE.WILLHABEN.AT



- 230 fashion categories
- 5 million images training set
- 3.2 million neurones with 6.1 million weights
- 200ms results returned to the user



Promo video: <https://vimeo.com/191007189?from=outro-embed>

Tech blog: <http://tech.willhaben.at/2016/11/visual-search-applied-fashion-cam.html>

# PERFORMANCE QUALITY

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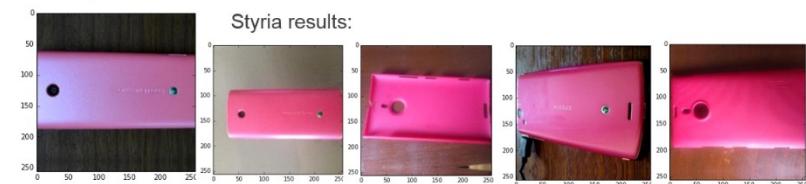
Query:



Google results:



Query:



Google results:



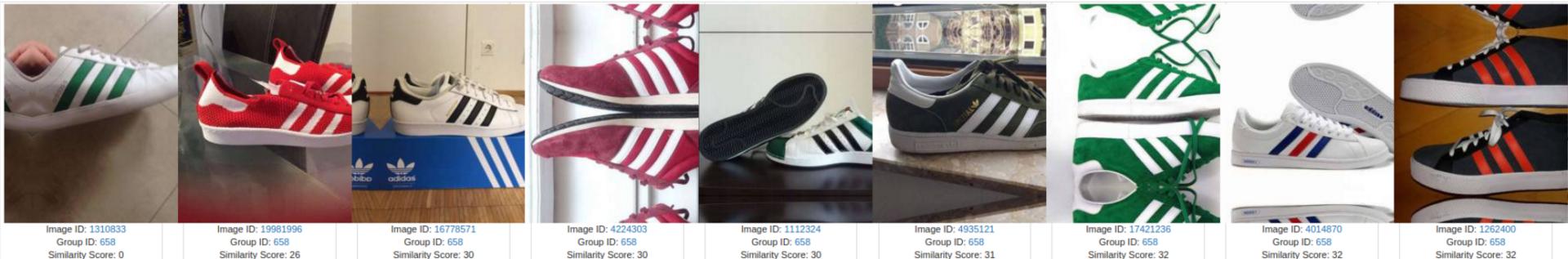
- Scalable High-performance cloud solution
- 100% Internal development
- Patent pending: Determining the similarity of images

# IN DEVELOPMENT

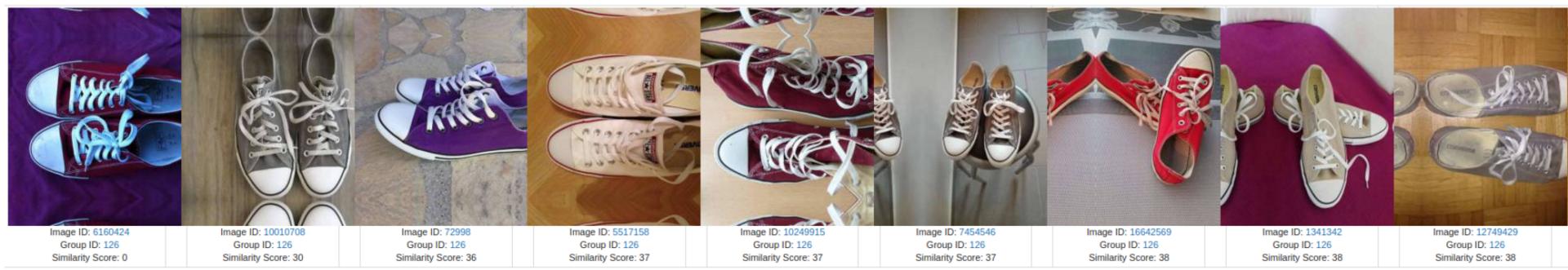
(STYRIA

- Image classification on 800 categories
- Understanding pictures & text
- Brands recognition

sneakers\_hash



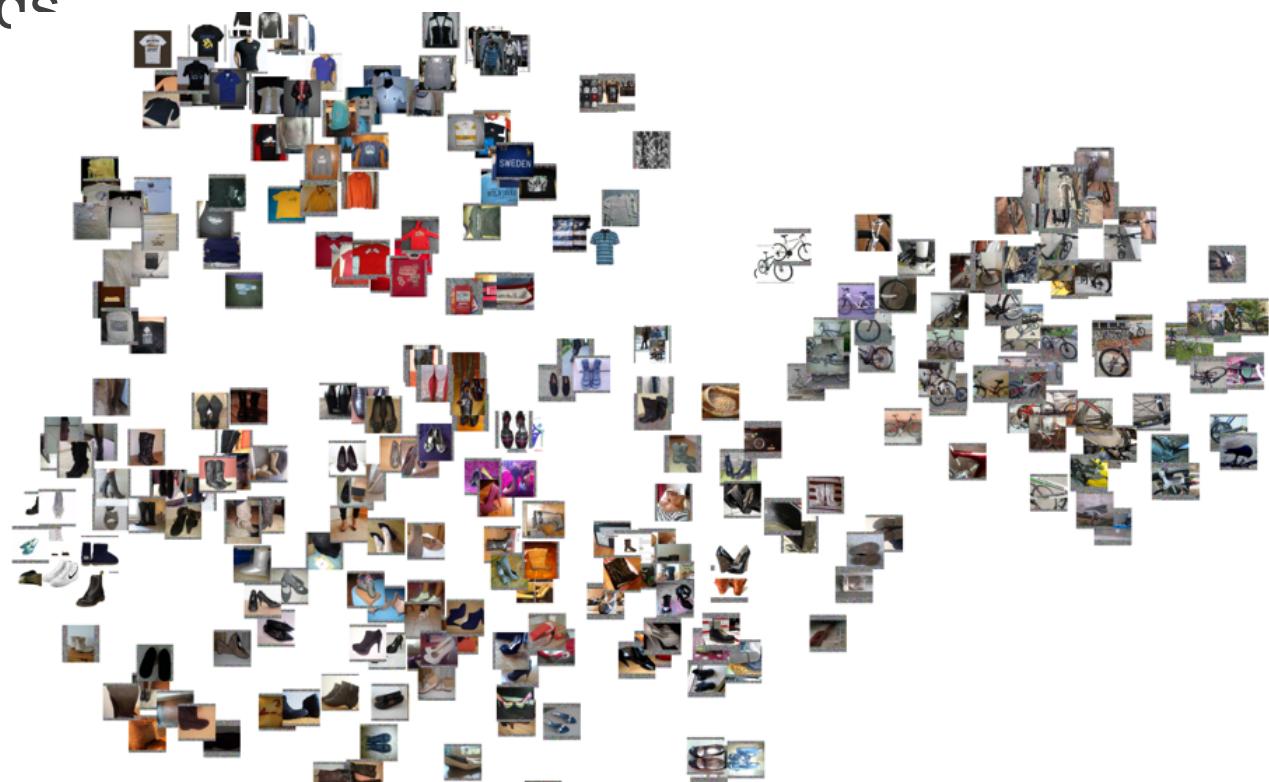
sneakers\_hash



# FUTURE PLANS

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- New categories & new classifieds
- Categories hierarchy optimisation
- News/Classifieds crosslinking
- Miscategorised ads
- Fraudulent ads
- Duplicate ads
- Customer data



Why?

- As radical as print to web migration
- Reinforced by the web to mobile migration
- Driven by customer expectations

→ No classified can miss this train and stay profitable in 5 years!

Open Discussion !





# THANK YOU

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