

Combining Machine Learning and Data-driven Approach for AI Services

Speaker: Xu Lu

College of Informatics

Research fields: Machine Learning/Computer Vision/Data Science

CONTENTS

1

Introduction

2

Research Achievements

3

CVLH AI Cloud Platform

4

Future Work

1

Introduction

**We are pacing into
big data and AI era.**



Over **1 billion** images are uploaded on WeChat **daily** — Tencent Research



Google AlphaGo resurged 3rd AI



AI is thought to be the next generation of industrial revolution



GPU



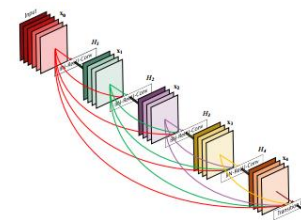
Big Data



Deep Learning



Introduction



2

Research Achievements

Computer Vision

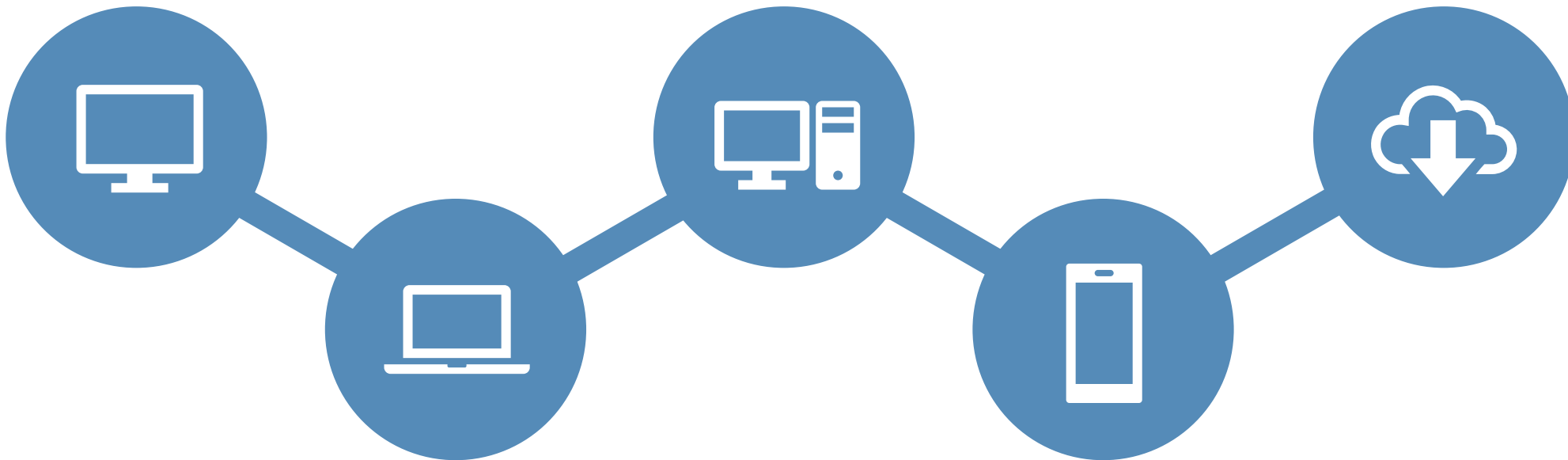
Visual Tracking; Face Recognition

Natural Language Processing

Sentiment Analysis; Text Classification

Data Mining

Real-world Applications



CVPR 16

Image Style Transfer Using
Convolutional Neural Networks

ICCV 2017 Oral Paper(2.1%)

Makeup-Go: Blind Reversion of Portrait Edit

ACMMM 17

Social Media Prediction Challenge

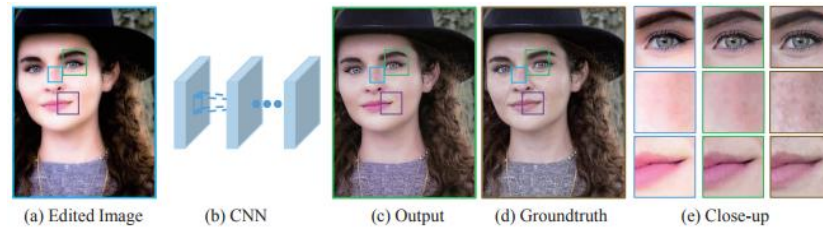
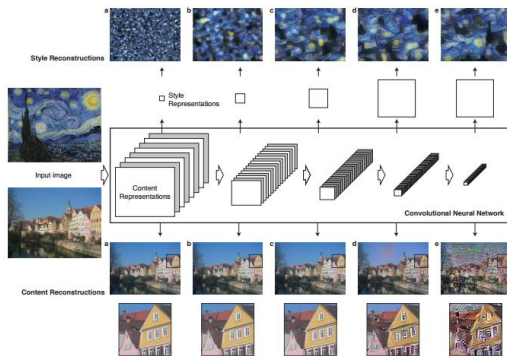


Figure 2: Some sample images from our prediction training dataset with hot annotation.

Hierarchical Multi-task Networks for Race, Gender and Facial Attractiveness Recognition*

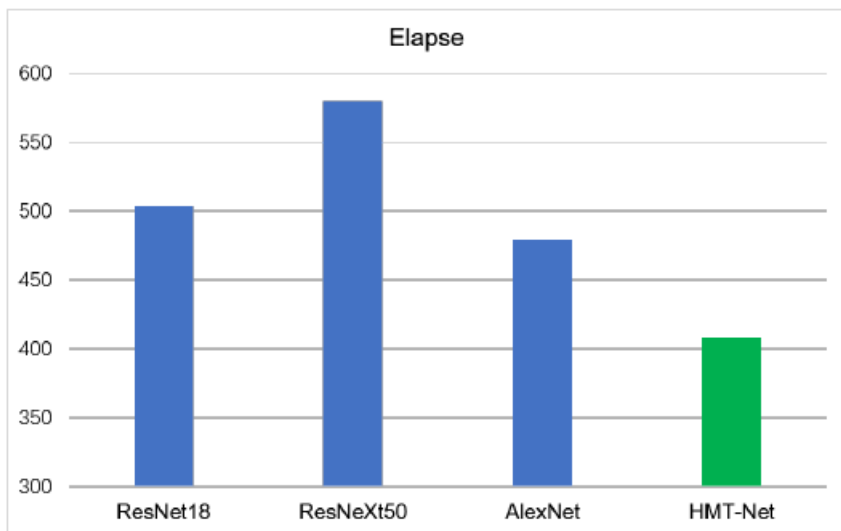
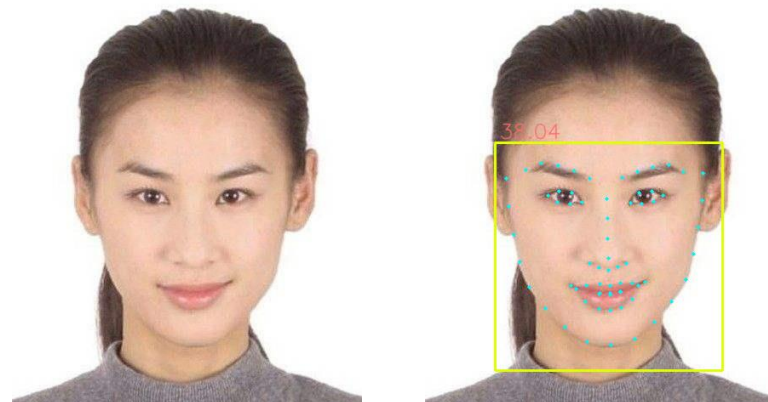


Figure 3: Time elapse comparison between HMT-Net and baselines [22]. HMT-Net achieves the fastest (408 ms per image) one to process an image with three different tasks.

Table 5: Comparison with Baseline Models By 60% Training and 40% Testing.

Model	MAE	RMSE	PC
AlexNet	0.2938	0.3819	0.8298
ResNet-18	0.2818	0.3703	0.8513
ResNeXt-50	0.2518	0.3325	0.8777
HMT-Net	0.2742	0.3596	0.8535

We compare performance of HMT-Net with other state-of-the-art baseline models [22]. HMT-Net achieves very competitive performance, compared with others.



Average Face in COI of HZAU





Combining Adversarial Learning and Hierarchy Deep Feature Fusion for Visual Tracking

Data-driven Approach for Quality Evaluation on Knowledge Sharing Platform

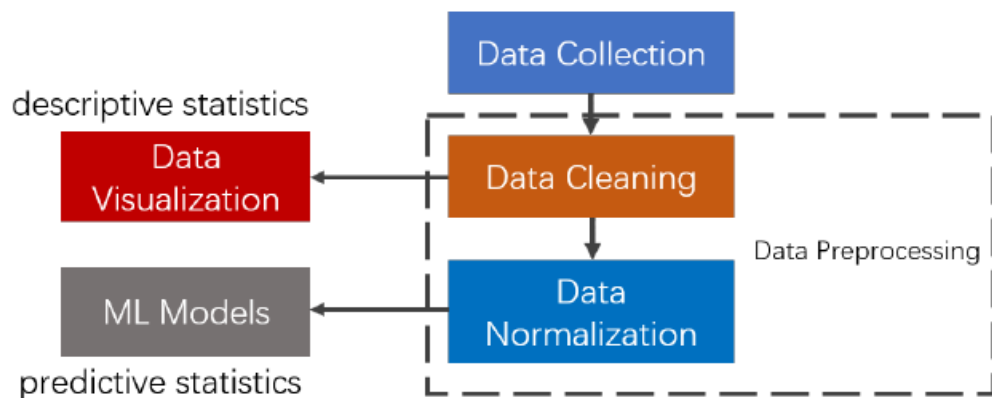


Fig. 1: The architecture of our data-driven method. The records are crawled from Zhihu Live official website and stored in MongoDB. Data preprocessing methods include cleaning and data normalization to make the dataset satisfy our target problem. We make descriptive analysis through data statistics and visualization, and predictive analysis using machine learning techniques.

Data-driven Approach for Quality Evaluation on Knowledge Sharing Platform

$$RMSE = \sqrt{\frac{1}{m} \sum_{i=1}^m (h(x^{(i)}) - y^{(i)})^2}, \quad (1)$$

$$MAE = \frac{1}{m} \sum_{i=1}^m |h(x^{(i)}) - y^{(i)}|, \quad (2)$$

$$Mean = \frac{1}{t} \sum_{i=1}^t p_i \quad (3)$$

$$Std = \sqrt{\frac{\sum_{i=1}^t (p_i - \bar{p})^2}{t - 1}} \quad (4)$$

TABLE VI: Performance Comparison with Baselines

Regressor	MAE	RMSE
Ridged	0.309 ± 0.01015554	0.41716 ± 0.015474592
Lasso	0.35038 ± 0.016164065	0.46916 ± 0.032221778
KNN	0.32328 ± 0.006829129	$0.43888 \pm \mathbf{0.006319968}$
SVR (RBF)	0.31022 ± 0.011957508	0.43322 ± 0.022196892
SVR (Linear)	$0.30134 \pm \mathbf{0.005944998}$	0.424 ± 0.016474374
SVR (Poly)	0.29974 ± 0.009122938	0.4208 ± 0.013073255
MLP	0.32024 ± 0.015835814	0.43496 ± 0.017316842
MTB-DNNs	$\mathbf{0.29954} \pm 0.012644485$	$\mathbf{0.40114} \pm 0.011662461$

Experimental results between different regression algorithms. The architecture of MLP is 15-16-8-8-1, where each number represents the number of neurons in each layer. We try three kinds of kernels (RBF kernel, linear kernel, and poly kernel) with SVM regression.

3

CVLH AI Cloud Platform



AI is the new electricity.
——Andrew Ng

AI can help business promote profit,
better understanding your customers,
entertainment apps,
precision agriculture,

...

But

How can everyone use AI?

No AI researchers No GPU cluster No adequate labeled data No excellent programmers



Computer Vision Lab of HZAU AI Cloud Platform

V1.0.1_R



Computer Vision Module



NLP Module

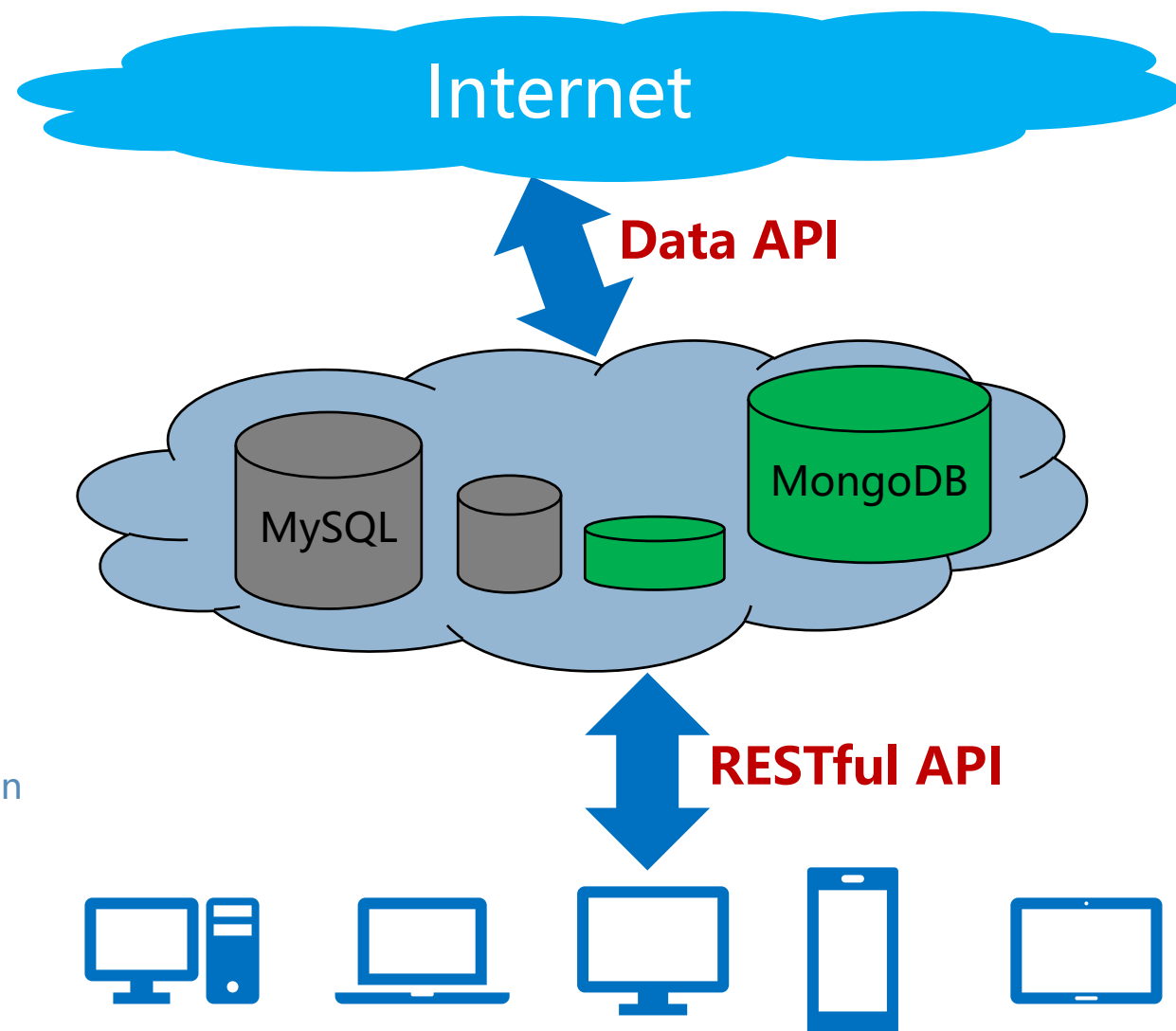
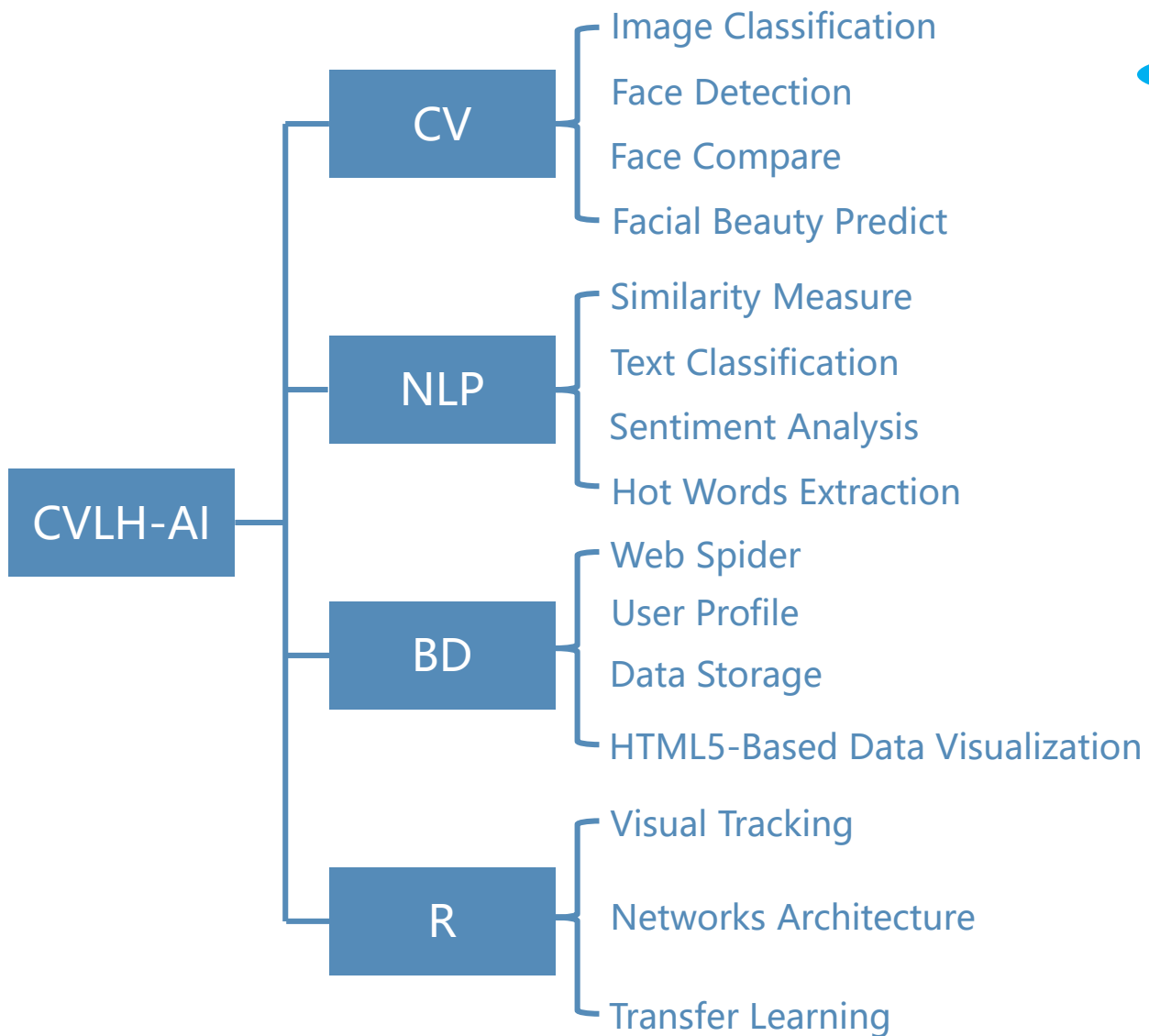


Big Data Module



Research Module







<https://github.com/lucasxlu/CVLH.git>

- **Permanently Free** for AI researchers
- Currently Free for commercial use
- **Open Source** available on github
- Under GPL3.0 LICENCE

Code Issues 0 Pull requests 0 Projects 0 Wiki Insights Settings

Computer Vision Lab of HZAU Edit

web springmvc mybatis spring restful-api computer-vision machine-learning data-mining python3 java8 deeplearning4j

deep-learning opencv3 javacv Manage topics

83 commits 1 branch 0 releases 1 contributor GPL-3.0

Branch: master New pull request Create new file Upload files Find file Clone or download

EclipseXuLu -- V0.2.9_ALPHA: Latest commit 615e2a1 on 30 Aug

Intro	-- V0.2.8_ALPHA:	3 months ago
lib	-- V0.2.1_BETA:	4 months ago
report	-- V0.2.8_ALPHA:	3 months ago
src	-- V0.2.9_ALPHA:	3 months ago
web	-- V0.2.8_ALPHA:	3 months ago
.gitignore	-- V0.2.8_ALPHA:	3 months ago
CVLH.iml	-- V0.2.8_ALPHA:	3 months ago
LICENSE	Create LICENSE	3 months ago
README.md	-- V0.2.8_ALPHA:	3 months ago
cvlh.sql	-- V0.2.4_ALPHA:	3 months ago
pom.xml	-- V0.2.8_ALPHA:	3 months ago

CVLH Home Members Publications Latest News Job Info Further Education Vision Lab Search

Academic Papers
There are the most cited papers in recent years.

Deep Learning
CVPR 2017
KDD 2017
+ more
Last updated 3 mins ago

Report of Data Mining and Visualization
Events Museum.

数据挖掘文本挖掘
数据挖掘用户画像
机器学习岗位数据挖掘
武汉市房价数据挖掘
2016行业研究报告
+ more
Last updated 3 mins ago

Job Opportunity
There are several job opportunities for our students to get the latest info in computer vision/deep learning/machine learning fields.


Baidu
Tencent
Alibaba
Toutiao
+ more
Last updated 3 mins ago

Copyright © 2017 Computer Vision Lab of HZAU

Image Classification Online
Large scale image classification based on deep convolutional neural networks powered by [deeplearning4j](#)


Classification

Maximally accurate Maximally specific

 torch 0.8081309
#neru 0.8080549
gown 0.8084039
groom 0.8072609
kimono 0.8037804

CNN took 2 seconds.

<http://wx3.sinaimg.cn/mw690/a7eaf218y187ydc8121t72mx2.jpg> Classify 1.05

Or upload an image:
 Upload

Copyright © 2017 Computer Vision Lab of HZAU

Hot Words Analysis

这家店真是一点都不好吃，环境也差！！

tokenize

Hit F5 to reload and capture filmstrip.

Filter ☐ Regex ☐ Hide data URLs ☐ All ☒XHR JS CSS Img Media Font Doc WS Manifest Other

10 ms 20 ms 30 ms 40 ms 50 ms 60 ms 70 ms 80 ms 90 ms 100 ms 110 ms

Name	Headers	Preview	Response	Cookies	Timing
tokenize		<pre>{status: 0, msg: "OK",...} data: {result: ["这家", "店", "真是", "一点", "都", "不", "好吃", "环境", result: ["这家", "店", "真是", "一点", "都", "不", "好吃", "环境", "也"] 0: "这家" 1: "店" 2: "真是" 3: "一点" 4: "都" 5: "不" 6: "好吃" 7: "环境" 8: "也" 9: "差" time: 1 msg: "OK" status: 0}</pre>			

1 requests | 357 B transferred

Machine Learning Job Info

Crawl Type : [⚡ Crawl](#)Job Type : [🔍 Search](#) [↺ Reset](#)

搜索						↺	📄	☰
jobname	company	jobtype	publishdate	location	applynum	handle		
深圳Webot招聘自然语言处理算法实习生	webot	shixi	2017/01/01	深圳	0	delete		
【实习生】【搜狗】复合搜索研发部	搜狗	shixi	2017/01/01	北京	0	delete		
深圳Webot招聘自然语言处理算法实习生	webot	shixi	2017/01/01	深圳	0	delete		
深圳Webot招聘自然语言处理算法实习生	Webot	shixi	2017/01/01	深圳	0	delete		
【实习】【搜狐研究院】应用研发实习生	搜狐	shixi	2017/01/01	北京	0	delete		
【实习】【搜狐研究院】web前端实习生	搜狐	shixi	2017/01/01	北京	0	delete		
【实习】【搜狐研究院】机器/深度学习算法实习生	搜狐	shixi	2017/01/01	北京	0	delete		
【实习】【搜狐研究院】linux系统研发实习生	搜狐	shixi	2017/01/01	北京	0	delete		
【实习】【搜狐研究院】linux系统研发实习生	搜狐	shixi	2017/01/01	北京	0	delete		
【实习】【搜狐研究院】测试研发实习生	搜狐	shixi	2017/01/01	北京	0	delete		
显示第 1 到第 10 条记录，总共 50 条记录 每页显示 <input type="text" value="10"/> 条记录						< 1 2 3 4 5 >		



How can CVLH-AI simplify your procedures?

Traditional Way to Build AI Services:

1. Recruiting AI researchers and computer programmers
2. Collecting lots of (labeled/unlabeled) (structured/unstructured) data
3. Hiring people to label the dataset
4. Buying servers and GPUs
5. Building models
6. Training ML models

Building AI Services with CVLH-AI:

1. Apply for CVLH-Key and CVLH-Secret
2. Integrate into your terminal

「Our Partner」



武汉智丽丰信息科技有限公司
WU HAN ZHILIFENG INFORMATION TECHNOLOGY CO.,LTD



觅思投资策略团队



松禾资本



Node Capital

Face Compare API
Image Rec API
Data API

Data API

Data API

Data API

API More than **150,000** calls

Data More than **15,030,000** records

4

Future Work

- Design better deep neural networks architecture
- Improve performance of CVLH-AI Cloud Platform

Thanks

Speaker: Xu Lu

College of Informatics

Research fields: Machine Learning/Computer Vision/Data Science