清華大學电子工程系
Department of Electronic Engineering, Tsinghua University

它思國際
TasiTech

Document Recognition and Analysis

Hong Kong Tasitech International Limited

06/2025

Catalog

Team

Company Profile

清華大學电子工程系
Department of Electronic Engineering, Tsinghua University

它思國際 TasiTech

QS World University Rankings

2024：12
2023：14
2022：13
2021：12
2020：11
2019：12
2018：8
2017：7
2016：15
2015：17

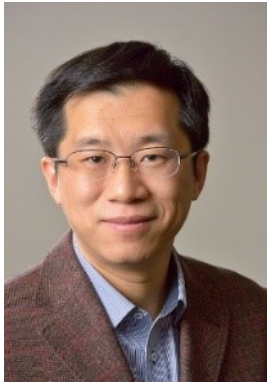
THU-EE

- Electronic Science and Technology
  - Physical Electronics and Optoelectronic
  - Electromagnetic Field and Microwave
  - Intelligent signal and information processing
- Information and Communication Engineering
  - Circuits and Systems
  - Communications and Information Systems
  - Complex Systems and Networks

Six major research areas

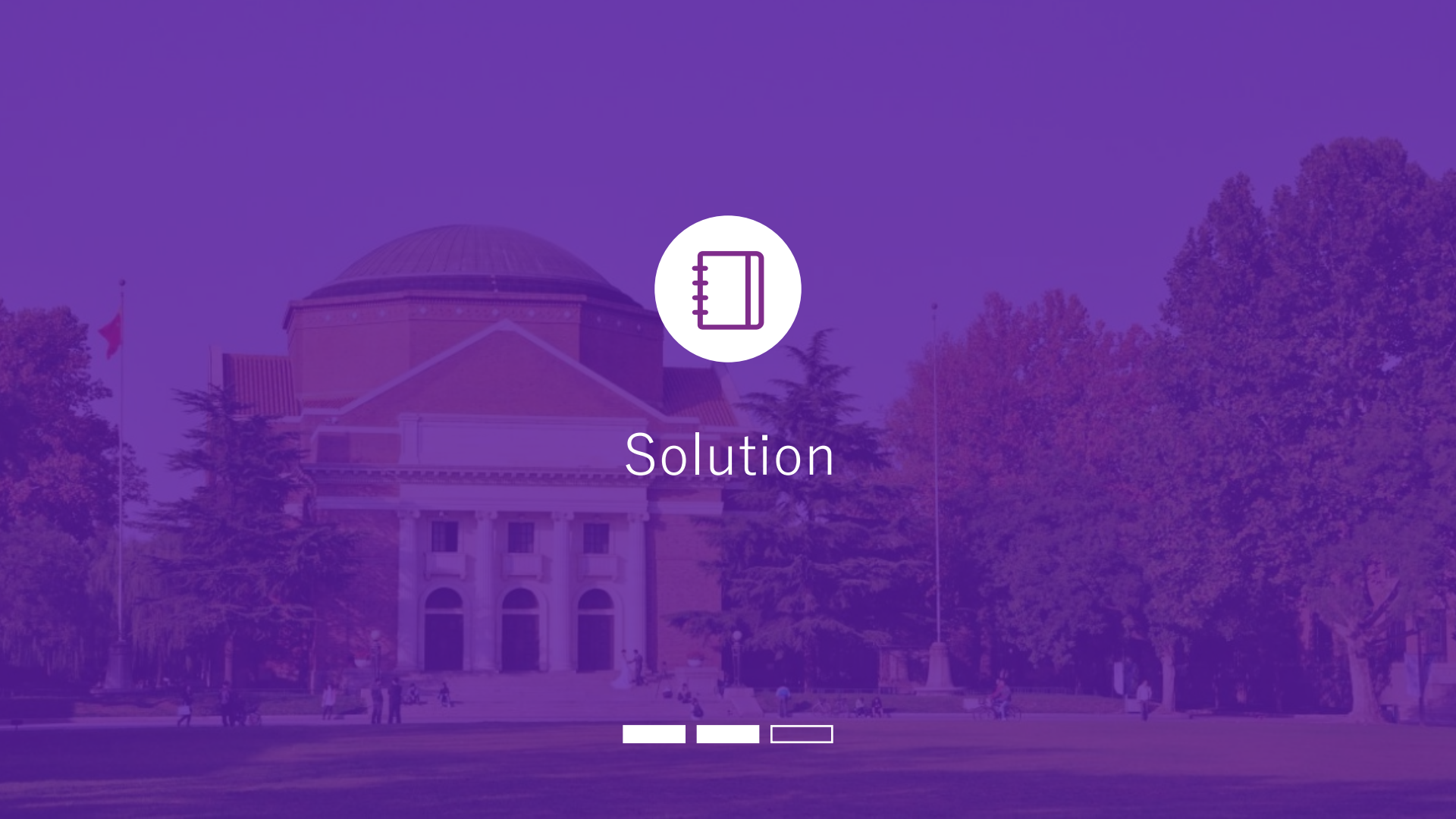
Relying on the **Speech and Intelligence Laboratory of Tsinghua University (THU-SPMI)**, Tasitech is mainly engaged in the research and development of artificial intelligence speech and language-related technologies and products, and has a world-class speech and language processing technology stack. The company is committed to building artificial intelligence products with efficient learning, high reliability and low cost to empower key industries. In recent years, tasitech has led the development of **semi-supervised AI**, getting rid of the practical bottleneck of current AI technology that relies too much on high-cost annotation, and synergistically using labeled data and labelless data to greatly improve the efficiency of data transformation into intelligence.

Chief Scientist Ou Zhijian



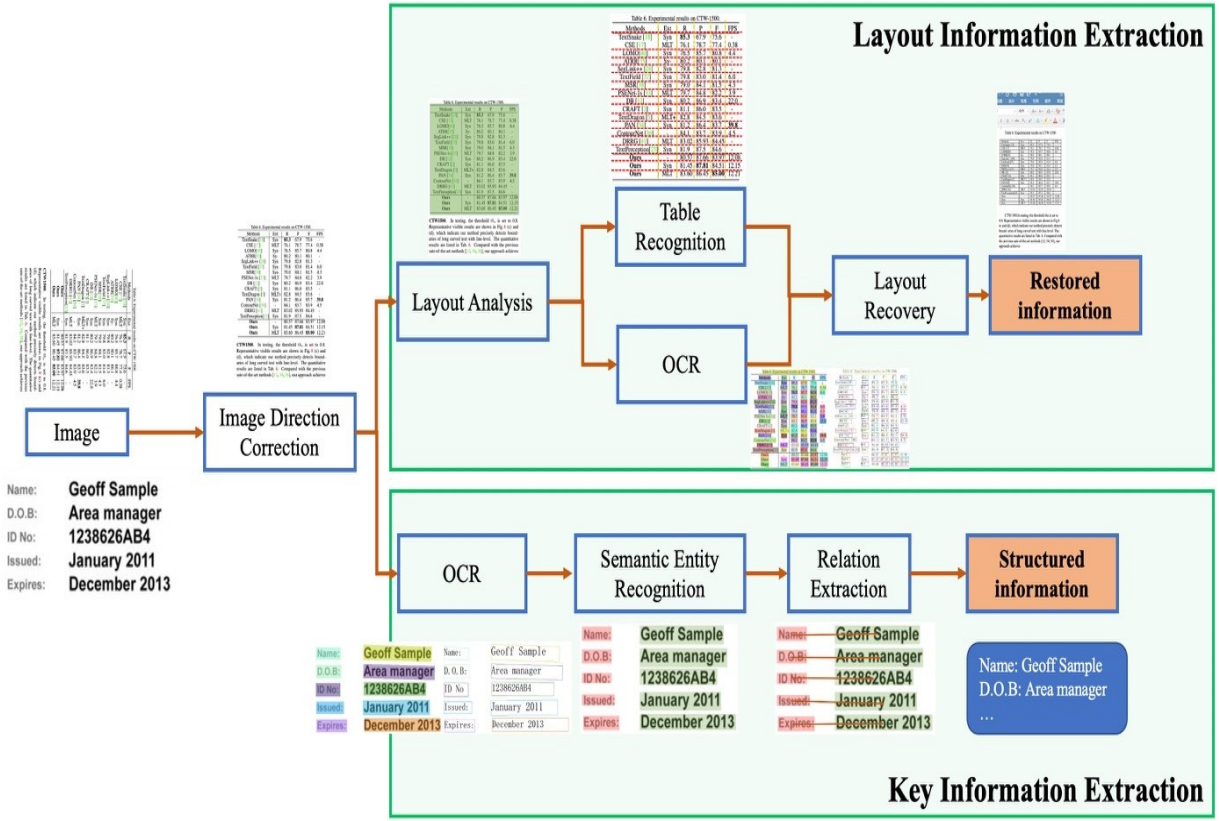
- Professor, THU-EE
- Visiting Scholar, UIUC
- Co-founder, TasiTech

- **General Chair**, 8th IEEE Spoken Language Technology Workshop (SLT) 2021
- Senior Area Editor (01/2025-01/2028), Associate Editor (05/2019-05/2024), **IEEE/ACM Transactions on Audio, Speech and Language Processing** (TASLP)
- Editorial Board Member (11/2021-present), **Computer Speech and Language**
- Senior Area Editor (03/2024-03/2026), **IEEE Signal Processing Letters**
- **Chair** of Workshops Sub-Committee (since 2022) and Committee Member (2020 - 2022, 2023 - 2025), **IEEE Speech and Language Processing Technical Committee (SLTC)**
- Committee Member (2019-present), APSIPA Machine Learning and Data Analytics (MLDA) Technical Committee
- **Distinguished Member** (2022-present), China Computer Federation (CCF)
- **Standing Committee Member** (2018-present), CCF Speech Conversation and Auditory Technical Committee
- Committee Member (2021-present), Speech Acoustics and Hearing Branch, The Acoustical Society of China (ASC)
- **Steering Committee Member** (2017-present), National Conference on Man-Machine Speech Communication (NCMMSC)



Solution

Document Parsing



Functional Description ：

1）Support layout analysis of documents in the form of images/pdfs, which can be divided into areas such as text, titles, tables, figures, formulas, etc.;

2）Support common Chinese and English table detection tasks;

3）Support printed and handwritten text extraction tasks;

4）Support structured table recognition, and output the final result to Excel file;

5）Support multimodal-based Key Information Extraction (KIE) tasks - Semantic Entity recognition (SER) and Relation Extraction (RE);

6）Support customized training.

Document Classification

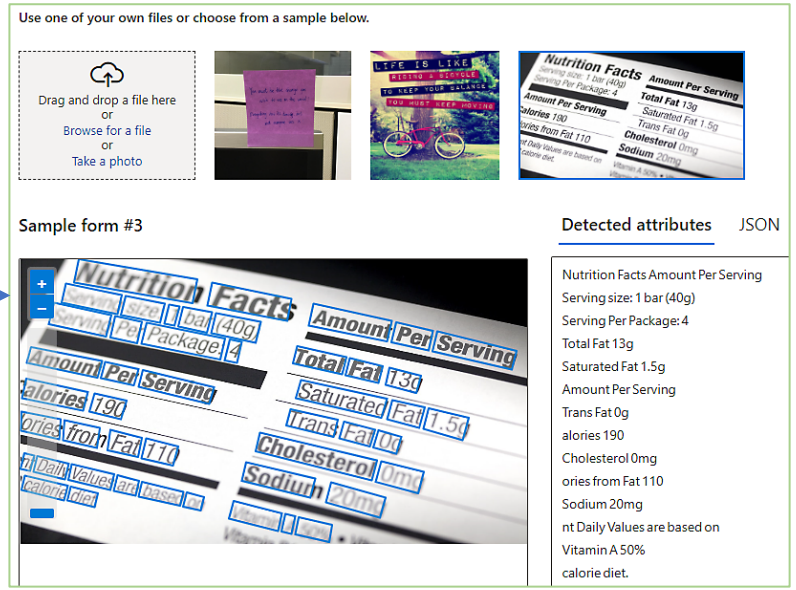
The system has extremely high accuracy in structured extraction of documents, certificates or bills, meeting the business needs of specific scene recognition and structured extraction, and has more than 200 standard intelligent document recognition engines.

Intelligent Recognition Engine

OCR Engine

Image

OCR engine

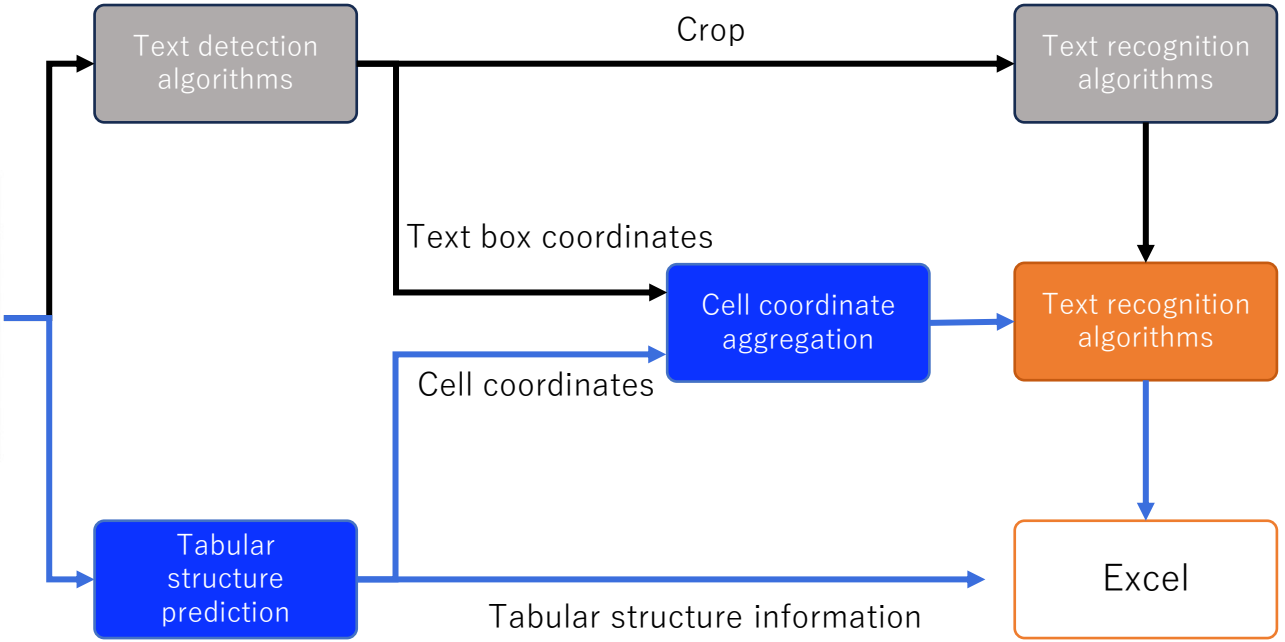


Recognition Results

- Printed and handwritten text extraction in supported languages
- Pages, text lines and words with location and confidence scores
- Support for mixed languages, mixed mode (printed and handwritten)

Form Identification

Method	BSD68		Urban100	
	10	70	10	70
CBM3D [14]	35.91	26.00	36.00	26.31
TNRD [12]	33.36	23.83	33.60	22.63
DnCNN [69]	36.31	26.56	36.21	26.17
MemNet [51]	N/A	25.08	N/A	24.96
IRCNN [70]	36.06	N/A	35.81	N/A
FFDNet [71]	36.14	26.53	35.77	26.39
RDN [77]	36.47	26.85	36.69	27.63
IPT (ours)	**38.30**	**28.21**	**39.07**	**28.80**



Algorithm	SLANet
ACC	76.31%
TEDS	95.89%
Speed	766ms

•**Acc:** The accuracy of the model in recognizing the table structure in each image is an error, and a wrong token is considered an error.

•**TEDS:** The accuracy of the model's restoration of table information, which not only includes the table structure, but also contains the text content in the table.

•**Speed:** The inference speed of a single image when the model is on the CPU machine and MKL is enabled.

Printed document recognition

主要财务比率	2020	2021	2022E	2023E	2024E
成长能力					
营业收入	97.08%	33.28%	65.00%	42.10%	21.00%
营业利润	165.21%	22.38%	31.65%	64.55%	36.68%
归属于母公司净利润	164.75%	24.17%	39.44%	64.13%	38.63%
获利能力					
毛利率	25.45%	23.01%	16.80%	17.00%	18.00%
净利率	13.98%	13.03%	11.01%	12.72%	14.57%
ROE	19.29%	19.25%	20.77%	47.11%	35.24%
ROIC	44.53%	41.55%	44.21%	32.59%	62.14%
偿债能力					
资产负债率	48.28%	54.90%	57.79%	65.62%	58.84%
净负债率	-39.12%	-36.03%	6.62%	8.70%	5.28%
流动比率	1.77	1.74	1.60	1.41	1.65
速动比率	1.26	1.07	0.85	0.62	0.81
营运能力					
应收账款周转率	5.16	4.59	4.11	5.24	5.24
存货周转率	3.48	2.89	2.55	2.77	2.63
总资产周转率	0.80	0.78	0.93	1.21	1.22
每股指标（元）					
每股收益	0.84	1.04	1.45	2.38	3.30
每股经营现金流	0.03	0.04	-2.54	4.28	-1.13
每股净资产	4.34	5.40	6.97	5.05	9.35
估值比率					
市盈率	41.30	33.26	23.85	14.53	10.48
市净率	7.97	6.40	4.95	6.85	3.69
EV/EBITDA	5.08	22.72	23.65	14.40	10.60
EV/EBIT	5.33	24.19	25.45	15.05	10.95

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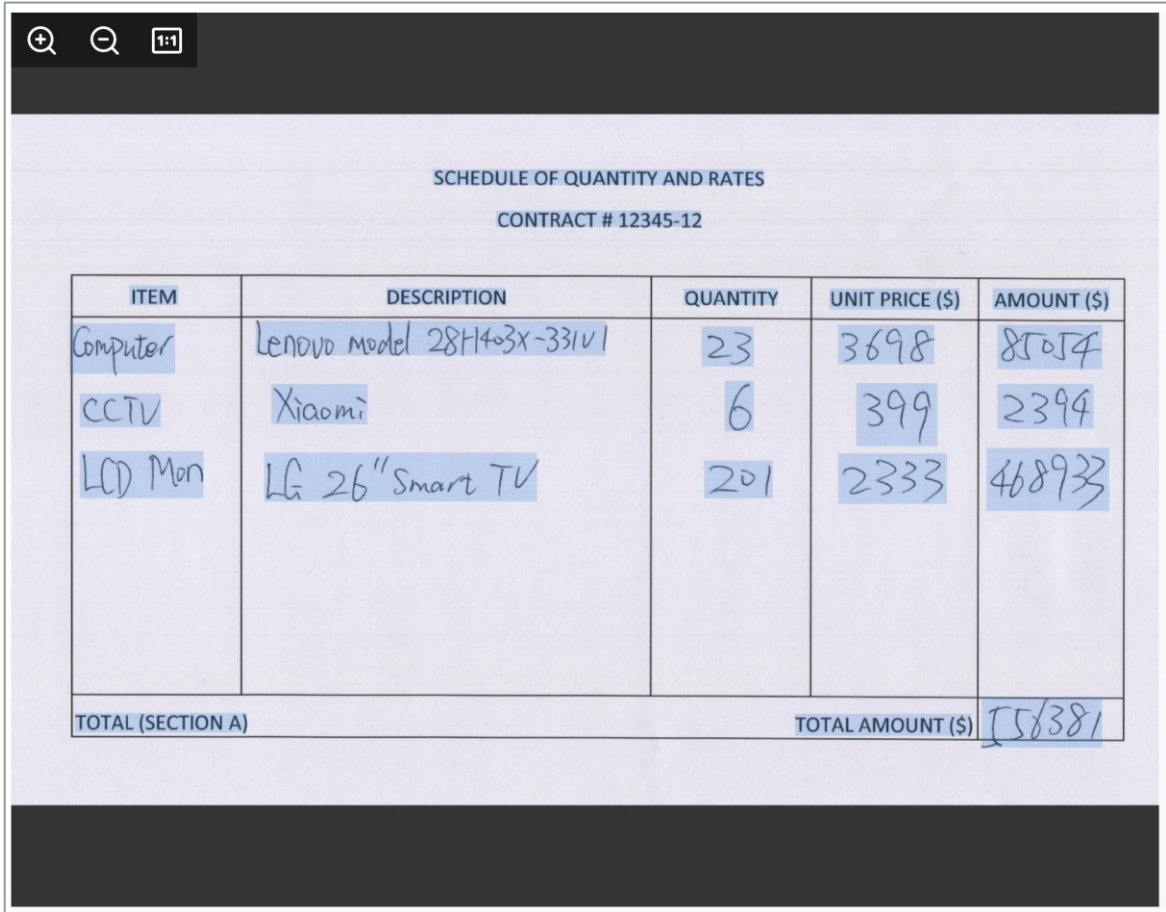
Handwriting document recognition



SCHEDULE OF QUANTITY AND RATES

CONTRACT # 12345-12

ITEM	DESCRIPTION	QUANTITY	UNIT PRICE ($)	AMOUNT ($)
Computer	Lenovo model 28H403x-331v1	23	3698	85054
CCTV	Xiaomi	6	399	2394
LCD Mon	LG 26"Smart TV	201	2333	468933
TOTAL (SECTION A)			TOTAL AMOUNT ($)	556381

识别结果 请求参数 JSON结果

8 Computer
宽度： 134 高度： 64
左间距： 74 上间距： 265

9 Lenovo model 28H403x-331v1
宽度： 444 高度： 44
左间距： 310 上间距： 262

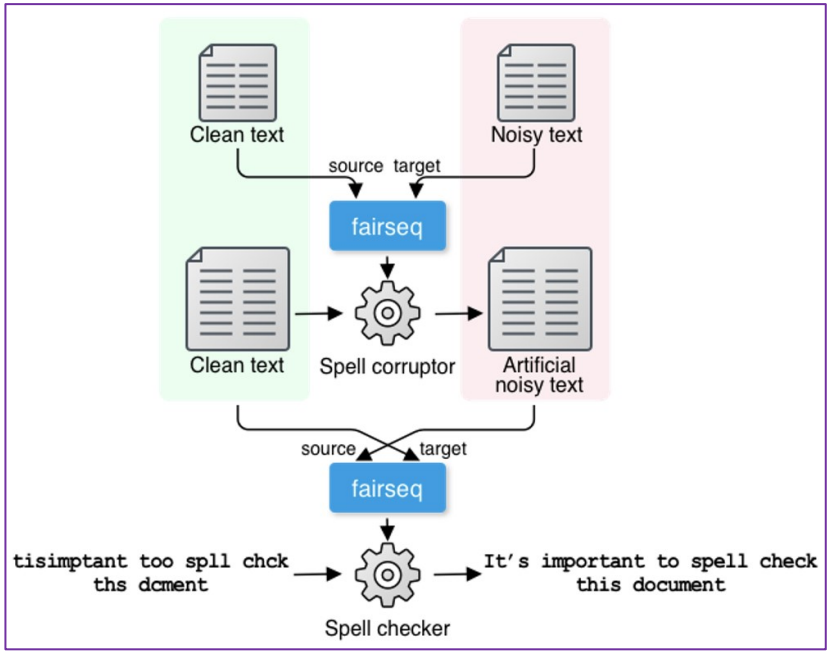
10 23
宽度： 66 高度： 51
左间距： 876 上间距： 269

11 3698
宽度： 122 高度： 50
左间距： 1049 上间距： 267

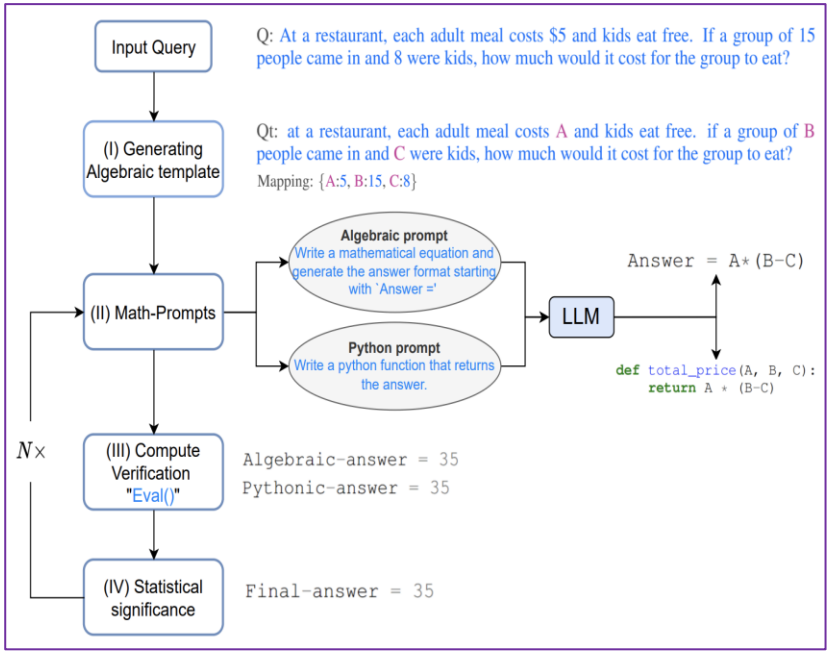
12 85054
宽度： 133 高度： 56
左间距： 1251 上间距： 267

13 CCTV
宽度： 103 高度： 43

Intelligent error correction



Spelling correction



calculates error correction using LLM

LLM

High reliability

TasiChat adopts Retrieval Enhanced Generative Formula (RAG) and uses the innovative Joint Approximation Algorithm (JSA) for joint optimization of retrieval and generation, which improves the reliability of Q&A.

Semi-supervised

Semi-supervised learning is adopted, and only 10% of the annotated data is needed to achieve a near-fully supervised effect. Dramatically reduces the time and cost of data preparation while maintaining a high level of prediction accuracy.

Localization

Adapted to Huawei's 910A computing power, it fully supports localized computing power in the future, which can ensure data security and privacy protection, reduce dependence on foreign technologies, and conform to the national information security strategy.

LLM

Large-scale model products that can be referenced and traced

01

Large model hallucinations problem - generate error messages

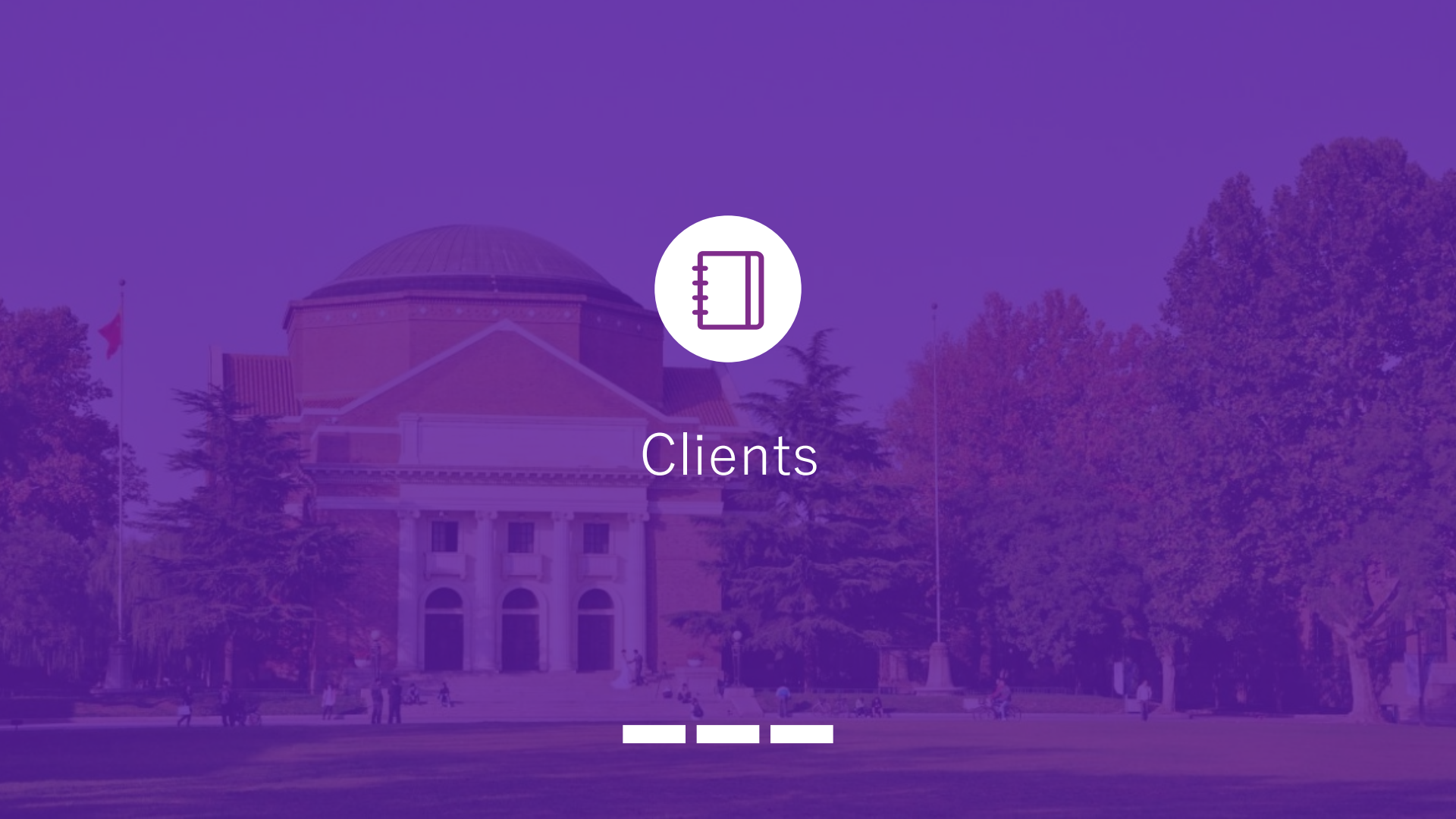
02

The answer is not relevant to the business

03

Without traceability, the knowledge obtained does not dare to be used

Solve pain points



Clients

Clients

国家广播电视总局
National Radio and Television Administration

中华人民共和国国家互联网信息办公室
Cyberspace Administration of China

Image analysis and recognition

北京儿童医院顺义和儿医院

航天中心医院
AEROSPACE CENTER HOSPITAL
1958

北京安贞医院
BEIJING ANZHEN HOSPITAL
安贞医院
ANZHEN HOSPITAL

THH
天津市环湖医院
Tianjin Huanhu Hospital

Inspection report identification

中华人民共和国南宁海关
NANNING CUSTOMS DISTRICT P.R.CHINA

Customs document identification

Thank You !