

New Generation of AI Patent Machine Translation



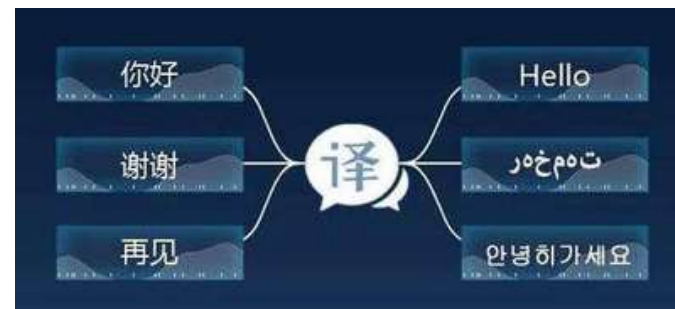
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Machine Translation

Machine translation (MT) is an **information processing technology** that uses computer algorithms to automatically translate one natural language (such as English) into another (such as Chinese).

Machine translation is a typical **computer artificial intelligence technology** integrating computational science, mathematics, cognitive science, linguistics and others.



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R&D Purposes of Patent Machine Translation

1

**Facilitate patent translation,
search, and examination**

Different professions in the patent industry

2

**Address communication problems
caused by language difference**

Patents written in different languages

3

**Satisfy professional and
language needs**

Expertise in technical knowledge and language

4

Realize standardization

Unified and standardized format of patents

5

**Reduce costs and improve
efficiency**

A large number of patents

6

Promote industry development

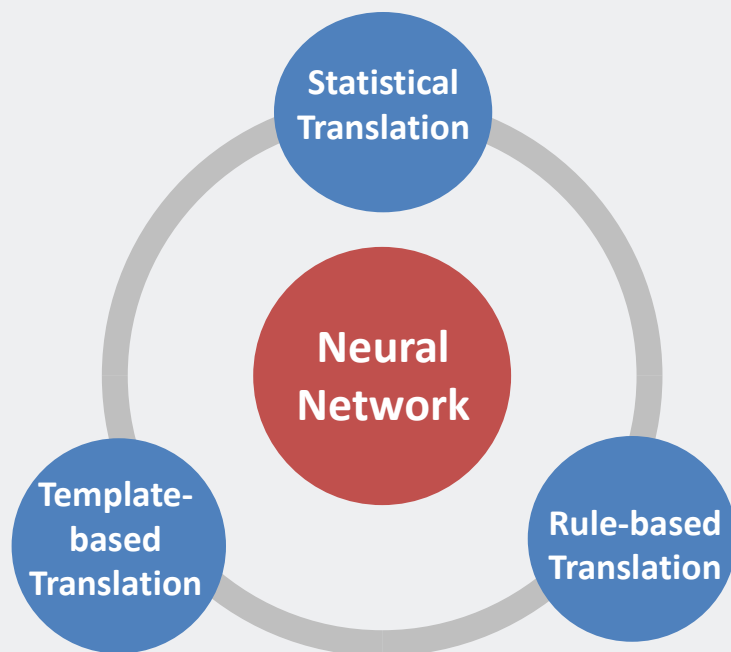
Rapid and healthy development of the patent industry



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Zhongzhi Huiyi (中知慧译) - Core Technology of Multi-strategy Neural Network Machine Translation



Neural Network + Statistical Translation

Deep Learning + Disambiguation

Template-based Translation

Analysis of Long and Difficult Sentences +
Sentence Pattern Consistency

Rule-based Translation

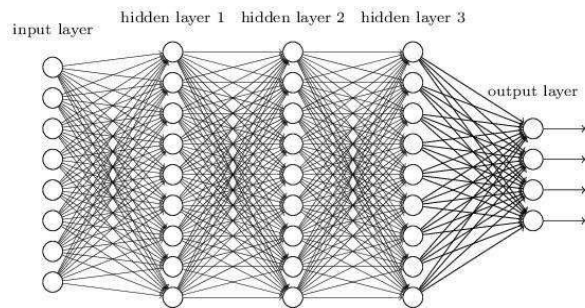
Syntax + Grammar Learning



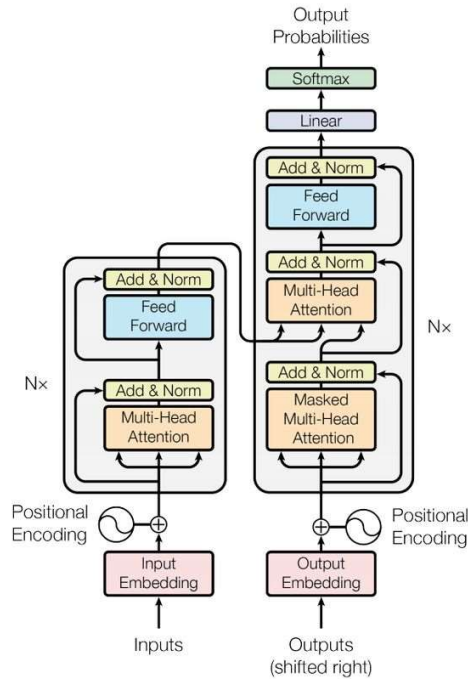
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Transformer(ANN) VS Brain Neural Network



Artificial Neural Network



Transformer



Brain Neural Network





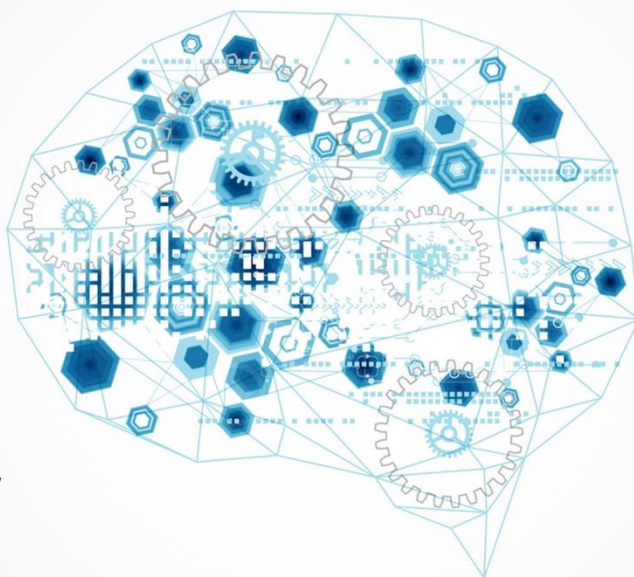
Advantages in Patent Data

01

Hundreds of thousands of patent translation templates

03

Tens of millions of high-quality bilingual patent sentences



02

Millions of patent terms

04

Pre-trained patent models based on **billions of** words



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Features of the Technology

1

Core technology

Multi-strategy neural network machine translation

3

Consistency

Terminological consistency of translation

5

Term searching

Searching terms in global patents



2

Quality and speed

High quality and speed of translation

4

Standardization

Normalization and consistency of sentence patterns

6

Corpus service

Mass data



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Challenges of Patent Machine Translation

1

Processing in **omission** to ensure information integrity

2

Processing in **long sentences, complex sentences** and specific patent sentence patterns

3

Processing in **terminological consistency**

4

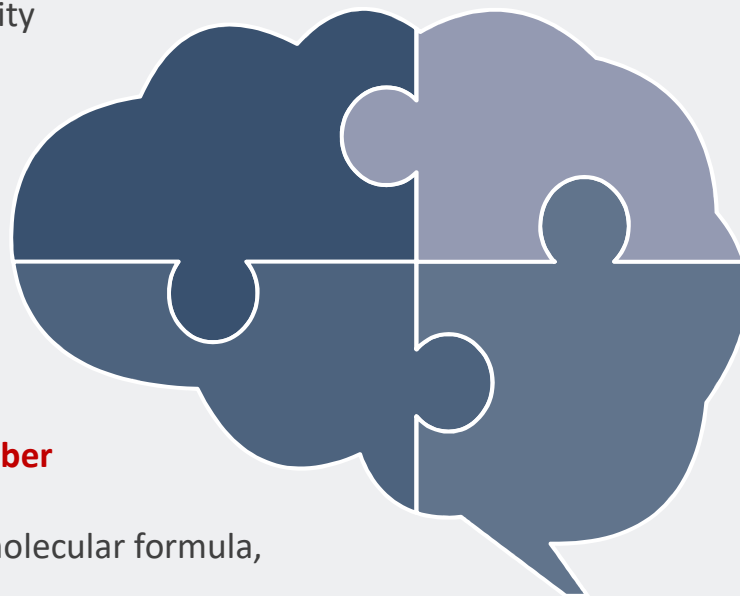
Processing in **claims** and other **special formats**

5

Processing in **number, time, name, and patent number**

6

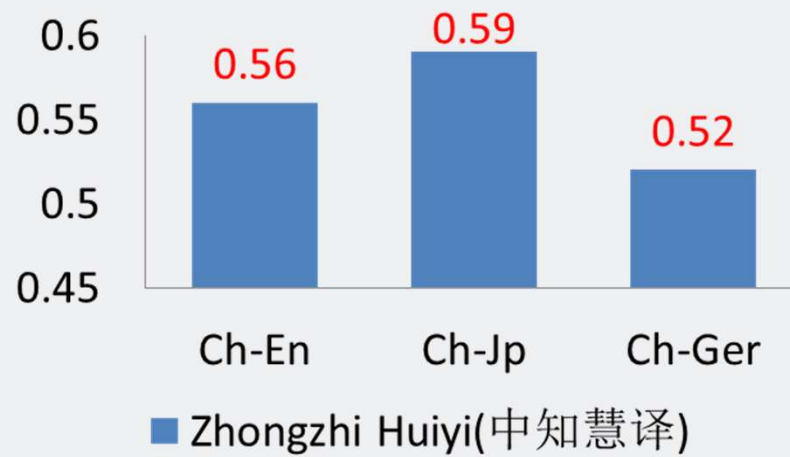
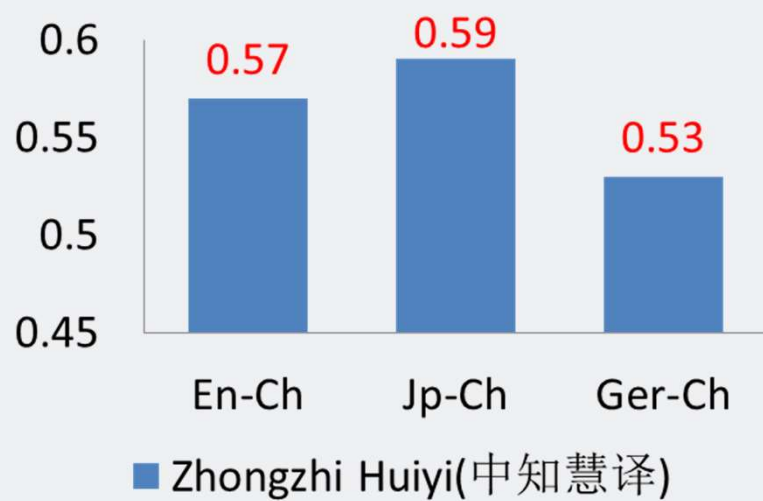
Processing in **special characters**, such as chemical molecular formula, superscript and subscript



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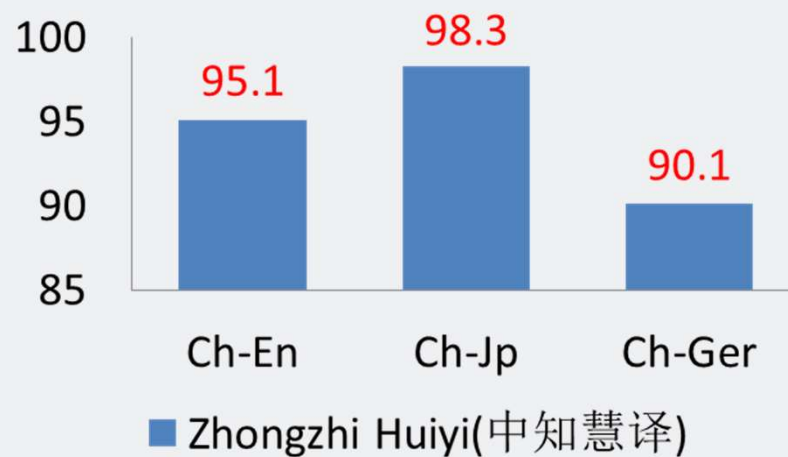
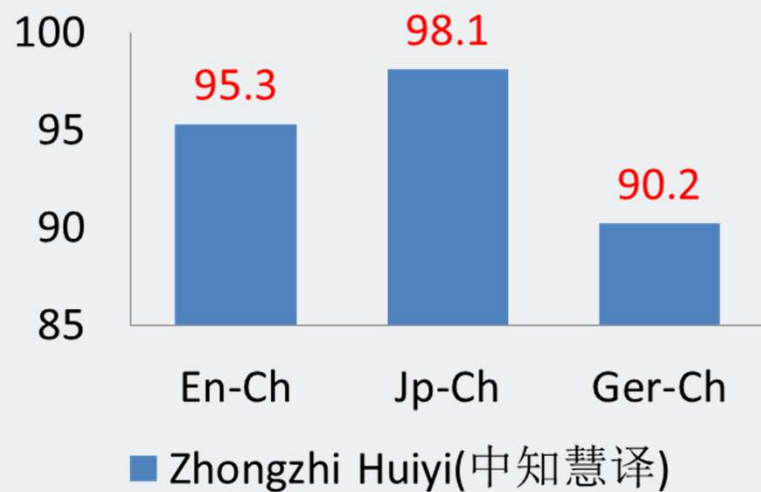


BLEU





Human Evaluation on Machine Translation





Example of NMT – English

In addition, according to a further aspect of the present invention , it is an object of the present invention to provide an improved method for supplying a network element with a charging policy to be enforced at said network element for charging of data reaching said network element of a communication network during a data session.

Machine Translation

此外，根据本发明的另一方面，本发明的目的是提供一种改进的方法，用于向网络单元提供要在所述网络单元处实施的用于对在数据会话期间到达通信网络的所述网络单元的数据进行计费的计费策略。

1. The logical structure of the long and complex sentence is processed correctly and conforms to the expression and language features of patents;
2. The translation is complete, accurate and professional.





Example of NMT – Japanese

ローヤルゼリーの水懸濁液を調製し、これに基質に対する作用部位の異なる二種類以上のプロテアーゼを同時又は逐次添加して室温以上の温度に保持し、酵素反応により不溶性物質を可溶化させることを特徴とする透明なローヤルゼリー溶液の製造法。

Machine Translation

一种透明蜂王浆溶液的制造方法，其特征在于，调制蜂王浆的水悬浮液，同时或逐次向其中添加对基质作用部位不同的二种以上的蛋白酶，保持在室温以上的温度，通过酶反应使不溶性物质可溶化。

1. The structure of the long sentence is accurately adjusted to ensure the language fluency of the translation;
2. The translation is complete, accurate and professional.





Example of NMT - German

Vorzugsweise ist die Mitte der Antriebsscheibe mit einem zweiten Rundloch versehen, wobei eine Seite der Antriebsscheibe mit einer ersten zu ihrer Achse parallelen Drehwelle versehen ist, und die erste Drehwelle nahe der äußeren Umfangswand der Antriebsscheibe angeordnet ist, wobei die erste Drehwelle dem ersten Rundloch entspricht.

Machine Translation

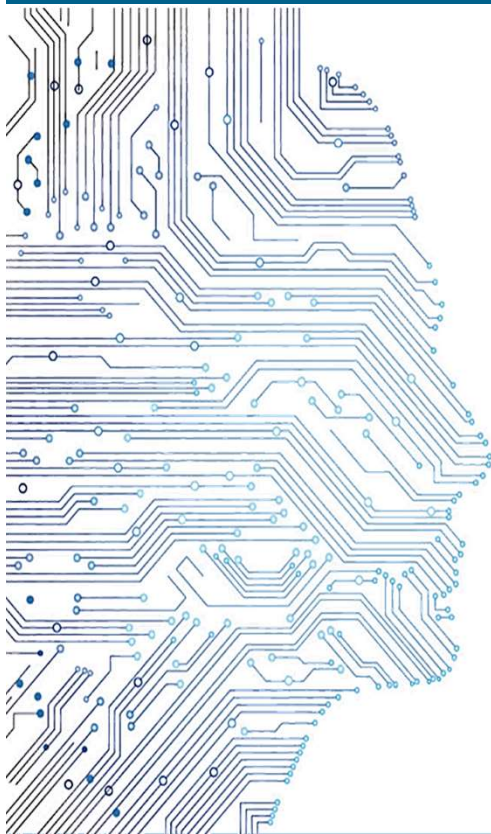
优选地，驱动盘的中心设置有第二圆孔，驱动盘的一侧设置有与其轴线平行的第一旋转轴线，并且第一旋转轴线设置在驱动盘的外周边缘附近，第一旋转轴线对应于第一圆孔。

1. The terms are accurately translated;
2. The translation is fluent, and clear in logical relations and sentence meaning.





Service for Patent Examiners



Real-time machine
translation service for
patent examiners to
facilitate their work

1

Number of Users
10,000+

2

Number of visits per day
50,000+

3

Number of words translated per day
10,000,000+



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Translation of Mass Data

Translation of Global Patent Data



01

Number of patents translated per day: **100,000**

02

Number of words translated per day: **1 billion**

03

Number of languages: **10**



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Our Partners

01

Online translation
system has more than **220,000**
registered users

02

Signed cooperation
agreements with more than **30**
companies and institutions



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