Machine Translation: Modeling, Algorithm and Knowledge

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MT Sample Results

(S) Did you know that your investment advisor will tell you that fine wine investment consistently delivers between 12 and 30% growth in value? From mid-2009 to 2011, the APM Fine Wine Index, which tracks price movements among investment wines, rose to 176 from 103 points.

(T1) 你知道吗，你的投资顾问会告诉你，始终如一地提供优质葡萄酒投资12至30％的增长值吗？从2009年年中到2011年的APM美酒指数，追踪在投资葡萄酒的价格走势，从103点上升到176。

(T2) 你知道你的投资顾问会告诉你，葡萄酒投资始终提供之间的12和30%的增长，价值？从2009年2011，杀伤人员地雷的精品葡萄酒指数，跟踪价格变动之间的投资葡萄酒，上升至176，103分

What is SMT?

SMT = Linguistic / Any Modeling

+ Statistical decision

Component:

Modeling / Training / Decoding

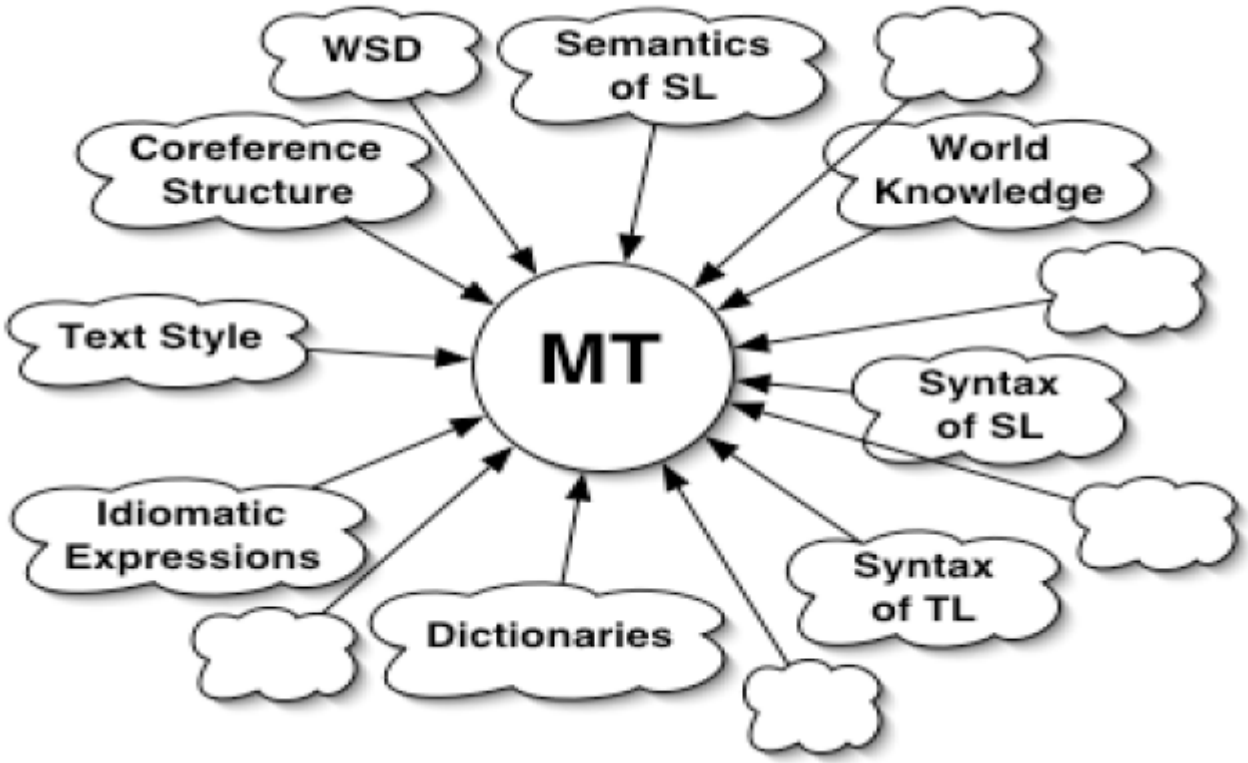
The State-of-the-Art

- Already achieved significant progress in recent 10 years in research and industry, but still in its infant stage.
- Many methodologies proposed and systems deployed, but still have too many issues to be solved. All the issues mixed, need to figure out the most key points.
- Modeling is one of the key points.
- Viewpoints: Research vs. Industry.

Modeling and Models

- Word-based
- Phrase-based based
- Syntax-based
- Shallow semantics-base
- ……

Knowledge Sources (from Och's slide)



MT: An AI-Hard Problem

- Word Order
- Word Sense
- Idioms
- Structure Divergence
- Semantic, Concept, Culture Difference
- MT is A Understanding Issue, the core of AI…

Amazing?

Training	Dev	Test	Bleu
LDC (5M)	NIST02	NIST05 (4 Refs)	0.38
		Part of Training Set (1 Ref)	>0.79

Issues: too many worth exploring

- Over dependency on parallel corpus
- Poor generalization ability
- Structure divergence
- Advanced monolingual NLP technologies do not work well at SMT
- .....

Solutions, Research Topics

- MT-oriented Multilingual Grammar Induction
- Non-parallel-corpora (monolingual) for SMT
- Semantics-based SMT

Machine Translation
Exciting, Enjoyable R&D!

Thanks!