Automatic Text Understanding for Education

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Text Understanding for Education
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Using a Reading Method

- Why use a reading method?
  - Directs your focus
  - Efficient and Effective
  - Saves time
  - Gets what you want in the minimum time
  - Works!!
Natural Language Processing

• Fundamental Tasks for Text Understanding
  • Understanding Word Semantics
  • Identifying Text Structures

• NLP Applications
  • Dialogue Systems
  • Argumentation Mining
  • Information Extraction
  • Sentiment/Emotion Analysis
Semantics of words and phrases

- Word Sense Disambiguation
  - willows lined the *bank*
  - he cashed a check at the *bank*
  - the *bank* is on the corner of Nassau and Witherspoon
Semantics of words and phrases
Semantic Class Tagging

• Identifying the semantic class of each noun phrase.
  • *E.g., does a phrase refer to a disease or a drug?*
• [A 14yo doxy] **ANIMAL** owned by [a reputable breeder]**HUMAN** is being treated for [IBD]**DISEASE** with [pred]**DRUG**. But [she]**ANIMAL** has not been improving.
Domain-Specific Contextual Semantic Tagging
Today, the Amazon river is experiencing a crisis of overfishing. [STATE]

Both subsistence fishers and their commercial rivals compete in netting large quantities of pacu, [GENERALIZING]

[which bring good prices at markets in Brazil and abroad. [GENERALIZING]
The Butler, Wis., manufacturer went public at $15.75 a share in August 1987,

and Mr. Sim’s goal then was a $29 per-share price by 1992.


The stock has since softened, trading around $25 a share last week and closing yesterday at $23 in national over-the-counter trading.

But Mr. Sim has set a fresh target of $50 a share by the end of reaching that goal.
The Butler, Wis., manufacturer went public at $15.75 a share in August 1987,

• [Expansion.Conjunction]

and Mr. Sim’s goal then was a $29 per-share price by 1992.

• [Expansion.Conjunction]


• [Comparison.Concession]

The stock has since softened, trading around $25 a share last week and closing yesterday at $23 in national over-the-counter trading.

• [Comparison.Contrast]

But Mr. Sim has set a fresh target of $50 a share by the end of reaching that goal.
• Could n’t get the car started on a Cold Day here in Canada.
• So I went into the Canadian Tire and checked my Car Battery on their charging Station.
• It did a test to start with and said the battery was good.
• And just needed charging -
  • so I charged it for 20 mins.
• Unplugged and Plugged it again to see what the test said
  • and again it said good battery
  • but it said it still needed charging .
• Only it would n’t charge
  • and instead said Battery too Hot.
Could n’t get the car started on a Cold Day here in Canada.
  • [Contingency.Cause]

So I went into the Canadian Tire and checked my Car Battery on their charging Station.
  • [Contingency.Cause]

It did a test to start with and said the battery was good.
  • [Expansion.Conjunction]

And just needed charging -
  • [Contingency.Cause]

so I charged it for 20 mins.
  • [Expansion.Conjunction]

Unplugged and Plugged it again to see what the test said
  • [Expansion.Conjunction]

and again it said good battery
  • [Comparison.Contrast]

but it said it still needed charging.
  • [Expansion.Alternative]

Only it would n’t charge
  • [Expansion.Alternative]

and instead said Battery too Hot.
Hierarchical Neural Networks for Inferring Text Structure
T3 Project: machine learning to machine teaching

• Dr. Jiang’s earlier talk
Developing an **Intelligent conversational Agent** for assisting learning Algebra by teaching a synthetic peer.
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