如何做一个精彩的学术报告

车万翔

哈尔滨工业大学

社会计算与信息检索研究中心

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思考题

- 为什么做学术报告?
  - 为了展示自己的工作
    - 论文像产品，报告则是广告
  - 为了更好地交流
  - 帮助理清思路
- 选择题：做怎样的学术报告?
  - 让听众明白我的论文中的技术细节 ✗
  - 引起听众的兴趣，愿意深入阅读我的论文 ✓
  - 将我所知的一切相关内容都告诉听众 ✗
  - 向听众显示我非常聪明 ✗
  - 让听众觉得来听报告很值得 ✓

听众模型

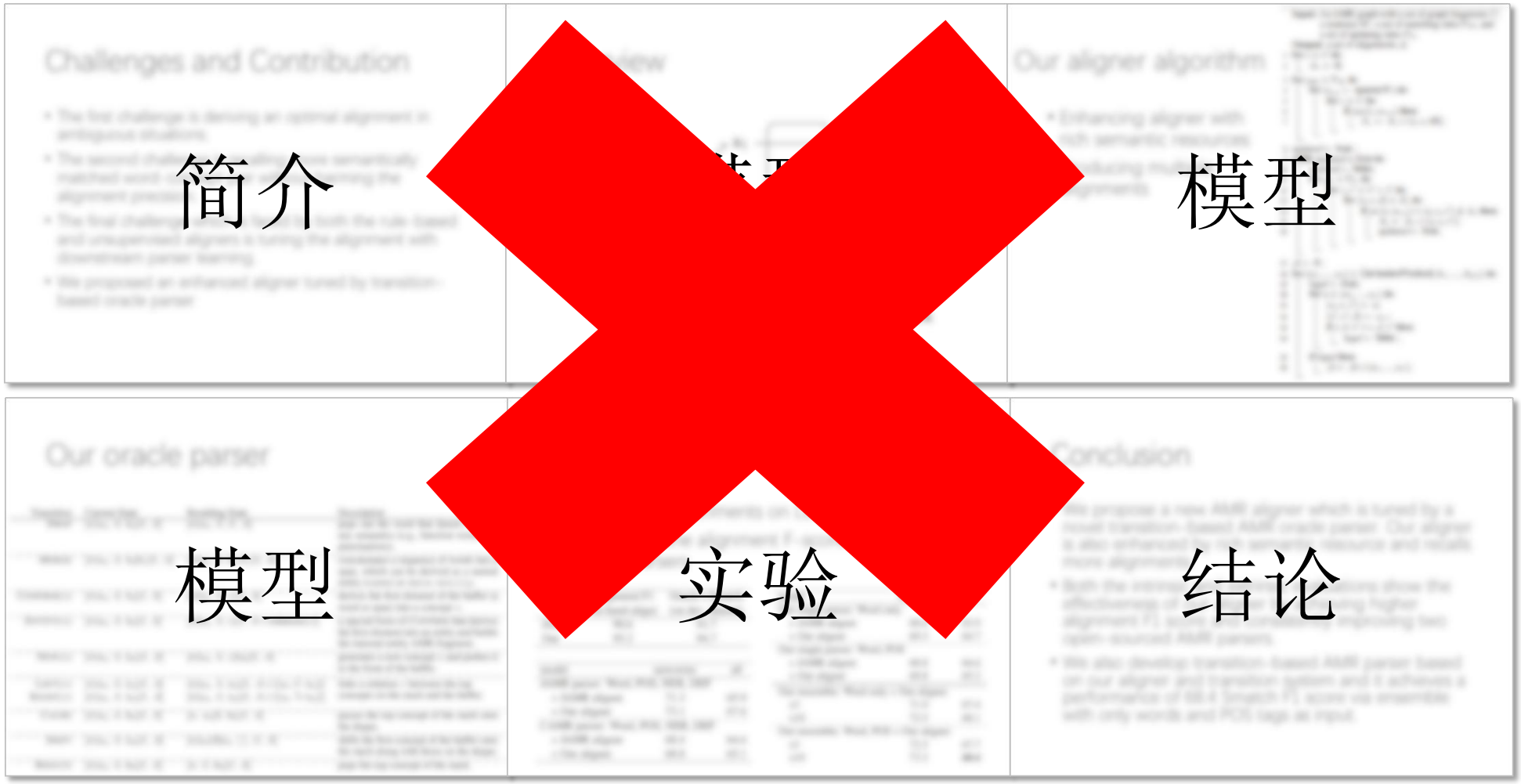
理想中的听众

- 领域专家
- 了解你的前期工作
- 已经读过你的论文
- 对于你的工作非常感兴趣

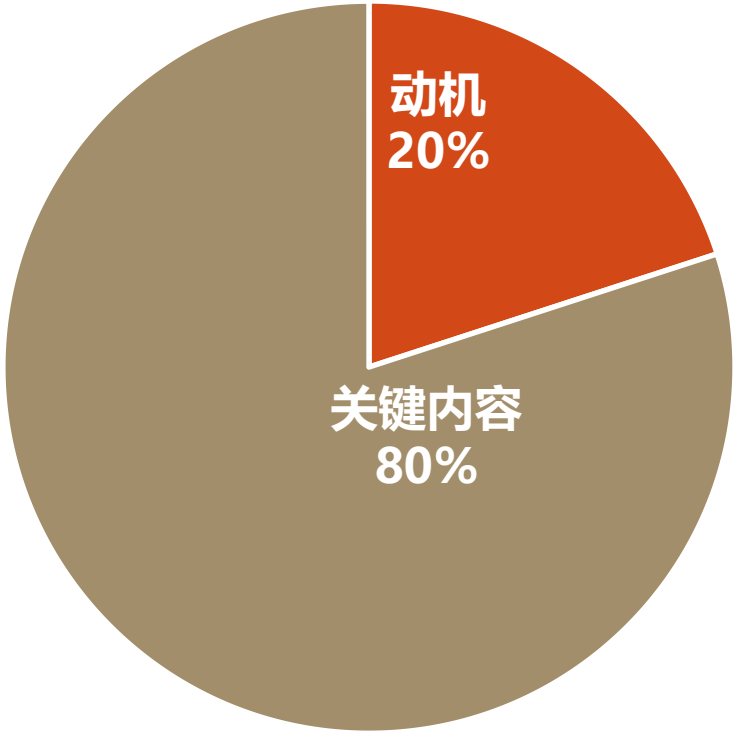
现实中的听众

- 来自其他领域
- 根本不了解到你的工作
- 这个时段没什么事情，恰巧发现这屋子有空座

幻灯片内容如何呈现?


Challenges and Contribution
Our aligner algorithm
Our oracle parser
Conclusion
简介
模型
模型
实验
结论

幻灯片内容如何呈现?

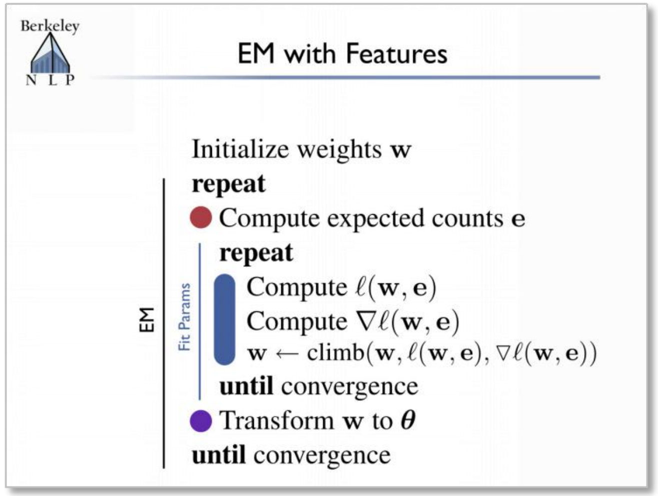


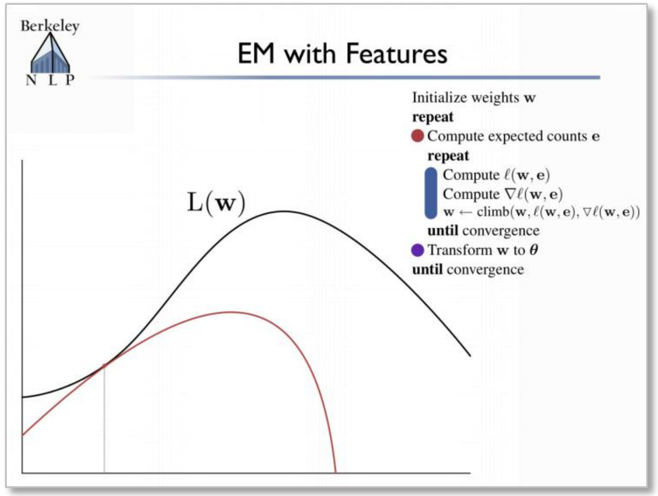
动机

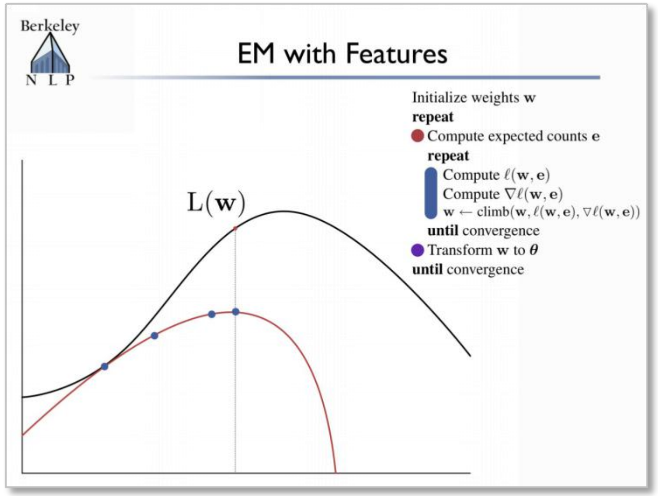
You have **two minutes** to engage your audience before they start to doze. -- Simon Peyton Jones in *How to give a great research talk*

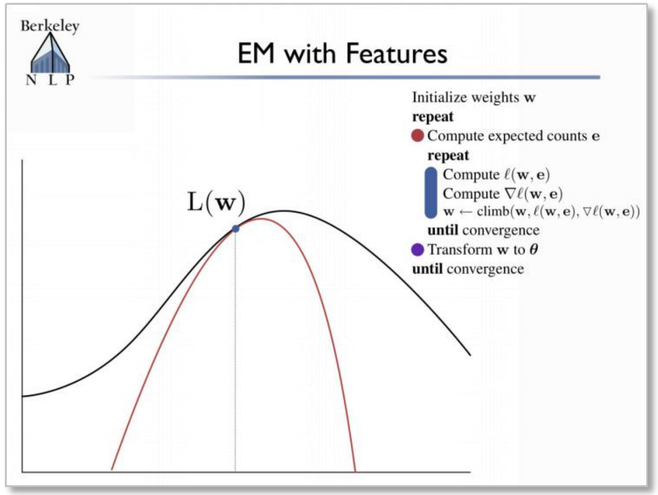
- 问题是什么？它为什么有趣?
- 之前的方法有什么问题?
- 我们的方法如何解决了这个问题?
- 核心创新点用不超过25个字描述
  - 屠呦呦：提取出青蒿素，有效降低疟疾患者死亡率（18字）
  - 袁隆平：杂交水稻育种，把水稻亩产从300公斤提升到900公斤（20字）
  - 刘永坦：发明海地波超视距雷达，能在沿海5000公里内发现隐形战机（25字）

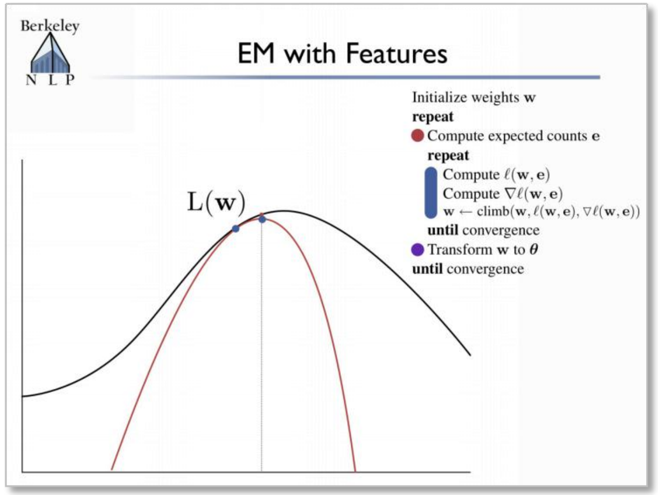
方法部分：多用例子











Taylor Berg-Kirkpatrick, Alexandre Bouchard-Côté, John DeNero, and Dan Klein. 2010. Painless Unsupervised Learning with Features，第28到54页

方法部分：反例

Transition	Current State	Resulting State	Description
DROP	$[\sigma\|s_0,\ \delta,\ b_0\|\beta,\ A]$	$[\sigma\|s_0,\ \delta,\ \beta,\ A]$	pops out the word that doesn't convey any semantics (e.g., function words and punctuations).
MERGE	$[\sigma\|s_0,\ \delta,\ b_0\|b_1\|\beta,\ A]$	$[\sigma\|s_0,\ \delta,\ b_0\_b_1\|\beta,\ A]$	concatenates a sequence of words into a span, which can be derived as a named entity (`name`) or `date-entity`.
CONFIRM(c)	$[\sigma\|s_0,\ \delta,\ b_0\|\beta,\ A]$	$[\sigma\|s_0,\ \delta,\ c\|\beta,\ A]$	derives the first element of the buffer (a word or span) into a concept `c`.
ENTITY(c)	$[\sigma\|s_0,\ \delta,\ b_0\|\beta,\ A]$	$[\sigma\|s_0,\ \delta,\ c\|\beta,\ A \cup \text{relations}(c)]$	a special form of CONFIRM that derives the first element into an entity and builds the internal entity AMR fragment.
NEW(c)	$[\sigma\|s_0,\ \delta,\ b_0\|\beta,\ A]$	$[\sigma\|s_0,\ \delta,\ c\|b_0\|\beta,\ A]$	generates a new concept `c` and pushes it to the front of the buffer.
LEFT(r)	$[\sigma\|s_0,\ \delta,\ b_0\|\beta,\ A]$	$[\sigma\|s_0,\ \delta,\ b_0\|\beta,\ A \cup \{s_0 \xleftarrow{r} b_0\}]$	links a relation `r` between the top concepts on the stack and the buffer.
RIGHT(r)	$[\sigma\|s_0,\ \delta,\ b_0\|\beta,\ A]$	$[\sigma\|s_0,\ \delta,\ b_0\|\beta,\ A \cup \{s_0 \xrightarrow{r} b_0\}]$	
CACHE	$[\sigma\|s_0,\ \delta,\ b_0\|\beta,\ A]$	$[\sigma,\ s_0\|\delta,\ b_0\|\beta,\ A]$	passes the top concept of the stack onto the deque.
SHIFT	$[\sigma\|s_0,\ \delta,\ b_0\|\beta,\ A]$	$[\sigma\|s_0\|\delta\|b_0,\ [\,],\ \beta,\ A]$	shifts the first concept of the buffer onto the stack along with those on the deque.
REDUCE	$[\sigma\|s_0,\ \delta,\ b_0\|\beta,\ A]$	$[\sigma,\ \delta,\ b_0\|\beta,\ A]$	pops the top concept of the stack.

方法部分：避免大量文字


:35 13/25
四、泛在智慧环境下的系统软件智能化机理
•传统基于规则的系统软件策略机制（例如调度机制、缓存机制、内存管理机制等）已经不能够匹配不断演进的硬件与应用
•系统软件智能化：将感知、规划、决策、行动各模块有机合，突破规则策略机制的限制，学习获得新环境下的智能策略
–IBM：Milepost GCC是机器学习编译器，能智能的优化程序，因此能缩短开发时间，同时又能提升性能。对IBM System p服务器的初步试验显示，嵌入式软件性能平均提高了18%[7]
Google：将机器学习运用在数据库系统中，对于真实数据的索引
神经网络建立的索引可以比传统的缓存优化 B 树索引方法
提高 70%
同时存储空间还能节省一个数量级[8]

实验部分：图比表格好

LDC2014T12 Experiments

- alignment F-score

Aligner	Alignment F1 (on hand-align)	Oracle's Smatch (on dev. dataset)
JAMR	90.6	91.7
Our	95.2	94.7

- parser improvements

model	newswire	all
JAMR parser: Word, POS, NER, DEP		
+ JAMR aligner	71.3	65.9
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CAMR parser: Word, POS, NER, DEP		
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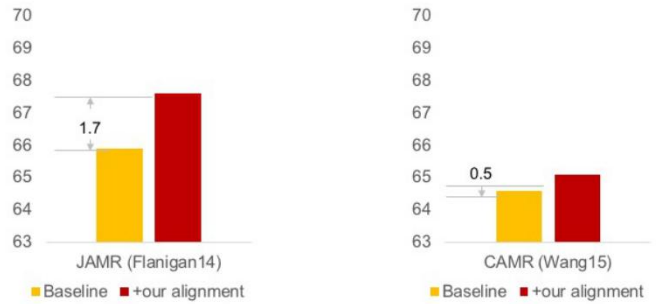
Aligner Experiments: Two Open-sourced AMR Parsers

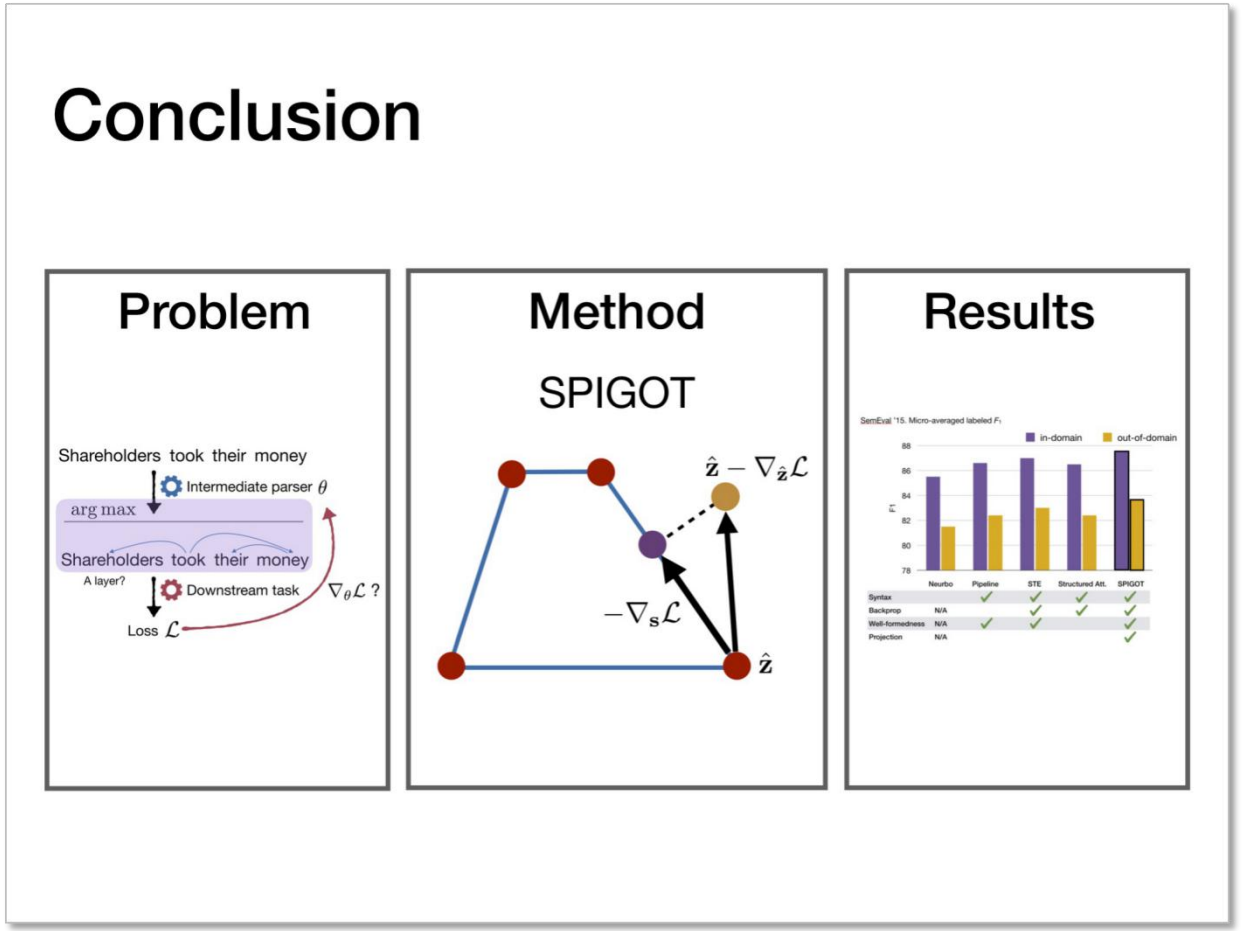


信息元素的易理解程度

用例子与图来描述方法和实验

刘洋. 2014. 机器翻译学术论文写作方法与技巧

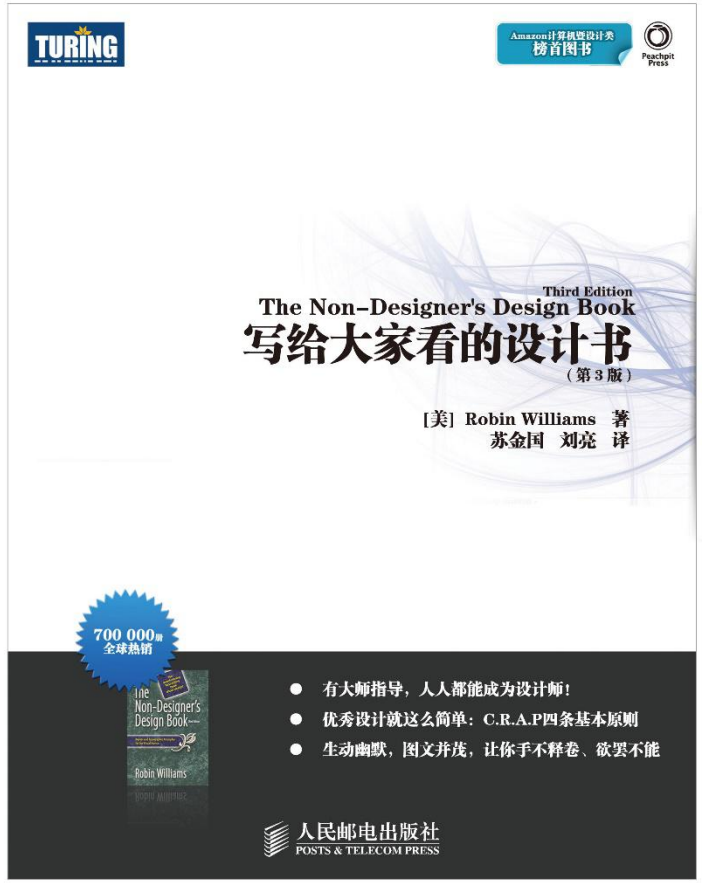
结论部分：新的展现形式



Hao Peng, Sam Thomson, and Noah A. Smith. 2018. Backpropagating through Structured Argmax using a SPIGOT，最后一页

设计原则

- 亲密性：相关的元素应该组织到一起
- 重复：相同的内容达到形式的统一
- 对比：如果两项不完全相同，就应使之截然不同
- 对齐：使元素之间产生关联，有关联的都应对齐



根据设计原则做幻灯片


Challenges and Contribution
• The first challenge is deriving an optimal alignment in ambiguous situations.
• The second challenge is recalling more semantically matched word-concept pair without harming the alignment precision.
• The final challenge which is faced by both the rule-based and unsupervised aligners is tuning the alignment with downstream parser learning.
• We proposed an enhanced aligner tuned by transition-based oracle parser
加入空行提高相关元素的亲密性
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相同内容使用相同样式即提高了一致性又形成了必要的对比
Challenges and Contribution
• Challenges
• deriving an optimal alignment in ambiguous situations.
• recalling more semantically matched word-concept pair witho
harming the alignment precision.
• tuning the alignment with downstream parser learning.
• Contribution
• an enhanced aligner tuned by transition-based oracle parser

避免不对齐

Our aligner algorithm

- Enhancing aligner with rich semantic resources
- Producing multiple alignments

Input: An AMR graph with a set of graph fragments C; a sentence W; a set of matching rules P_M; and a set of updating rules P_U.
Output: a set of alignments $\mathcal{A}$.

for $c \in C$ **do**
  $A_c \leftarrow \emptyset$;
for $\rho_M \in \mathrm{P}_M$ **do**
  for $w_{s,e} \leftarrow$ *spans*(W) **do**
    for $c \in C$ **do**
      if $\rho_M(c, w_{s,e})$ **then**
        $A_c \leftarrow A_c \cup (s, e, \mathrm{nil})$;
updated $\leftarrow$ true ;
while *updated* is *true* **do**
  updated $\leftarrow$ false;
  for $\rho_U \in \mathrm{P}_U$ **do**
    for $c, c' \in C \times C$ **do**
      for $(s, e, d) \in A'_c$ **do**
        if $\rho_U(c, w_{s,e}) \wedge (s, e, c') \notin A_c$ **then**
          $A_c \leftarrow A_c \cup (s, e, c')$;
          updated $\leftarrow$ true;
$\mathcal{A} \leftarrow \emptyset$;
for $(a_1, ..., a_c) \in$ *CartesianProduct*$(A_1, ..., A_{|C|})$ **do**
  legal $\leftarrow$ true;
  for $a \in (a_1, ..., a_c)$ **do**
    $(s, e, c') \leftarrow a$;
    $(s', e', d) \leftarrow a_{c'}$;
    if $s \neq s' \wedge e \neq e'$ **then**
      legal $\leftarrow$ false ;
  if *legal* **then**
    $\mathcal{A} \leftarrow \mathcal{A} \cup (a_1, ..., a_c)$;

“乱”的原因：视线跳动过多

Experiments

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Our ensemble: Word only + Our aligner		
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“乱”的解法：重新组织内容

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其它注意事项

- 不要在报告开始列大纲
  - 没有任何信息量
  - 无聊且浪费时间
- 不要罗列相关工作
  - 融入其它部分
- 不要罗列技术细节
  - 只会让听众昏昏欲睡
- 内容持续更新
  - 可以加入刚从其他报告中得到新的信息

演讲中最重要的武器

- **热情！**
  - 如果你对自己的工作都不兴奋，听众更不会感兴趣
  - 热情还能使你更放松
- 太紧张了怎么办?
  - 演讲之前深呼吸，或者去一下洗手间
  - 将开场白写下来（不建议写全部notes）
  - 来回走动或者使用一些肢体动作

其它注意事项

- 报告前
  - 提前测试好设备
  - 用U盘、网盘等备份slides
- 报告中
  - 面对听众，不能只盯着屏幕
  - 和听众有眼神的交流
  - 声音洪亮，有顿挫
  - 恰当运用动画
  - 控制好时间
- 报告后
  - 诚实回答观众的提问，不要避重就轻
  - 仔细倾听问题，不要打断对方
  - 分享幻灯片

总结

- 做学术报告的目的
- 幻灯片的内容和形式
  - 清晰阐述文章动机非常重要
  - 模型部分有取舍，用好图和例子
  - “结论”也有新思路
  - 四项设计的基本原则
- 演讲中的注意事项
  - 热情最重要
- 提高方法
  - 多学习其他人的报告
  - 多练习，任何topic

参考资料

- Simon Peyton Jones. *How to give a great research talk*
  - https://www.microsoft.com/en-us/research/academic-program/give-great-research-talk/
- 刘洋. *机器翻译学术论文写作方法与技巧*
  - http://nlp.csai.tsinghua.edu.cn/~ly/talks/cwmt14_tut.pdf