

Lost in Translation

Characterizing Automated Censorship in Online Translation Services

Samuel Ruo, Jeffrey Knockel (presenting), and Zoë Reichert

ମୁଖ୍ୟ କାର୍ଯ୍ୟ
କରିବାରେ ଏହାରେ
ମୁଖ୍ୟ କାର୍ଯ୍ୟ



Hi, how's it
going!!! ;)

Chinese translation platforms analyzed

Service	Total	% CN	% US	% TW	% HK
Alibaba	100.2K	85.3	6.50	1.35	1.28
Baidu	52.9M	91.1	1.52	1.80	1.56
Tencent	791.4K	89.3	2.85	3.35	N/A
Youdao	7.2M	86.2	2.55	1.96	2.39

Microsoft's Bing Translate

The screenshot shows the Microsoft Bing Translate interface. At the top, there are two language selection dropdowns: "Chinese Simplified" on the left and "English" on the right, separated by a bidirectional arrow icon. Below these, the input text is displayed in a large text area:

(1)蔡英文是台湾总统。 (2)习近平是中国国家主席。 (3)唐纳德特朗普是美国总统。

To the right of the input, the word "Translation" is displayed. Below the input text, there are several interactive icons: a speaker icon, a microphone icon, a "Tone" dropdown menu, and a download icon. At the bottom of the interface, the text "Widely used phrases" is visible, followed by a downward arrow icon.

Modeling censorship rules

(ordered, keyword, combinations)

Covers:

- singletons
- .*common.*regular.*expressions.*
- {unordered, keyword, combinations}

ordered + keyword + combination

Automated algorithm

Source: “President **Xi Jinping** gave a motivating speech despite the **bad** weather.”

Censorship rule: **Xi + Jinping + bad**

Censorship oracle: censored (**✗**) or not (**✓**)?

✗ PresidentXiJinpinggaveamotivatingspeechdespitethebadweather

Binary search for end of component

- PresidentXiJinpinggaveamotiva
- PresidentXiJinpinggaveamotivatingspeechdespi
- PresidentXiJinpinggaveamotivatingspeechdespitetheba
- PresidentXiJinpinggaveamotivatingspeechdespitethebadwea
- PresidentXiJinpinggaveamotivatingspeechdespitethebadw
- PresidentXiJinpinggaveamotivatingspeechdespitethebad

Linear search for beginning (typically faster than binary)

-  PresidentXiJinpinggaveamotivatingspeechdespitetheba%od
-  PresidentXiJinpinggaveamotivatingspeechdespitetheba%ad
-  PresidentXiJinpinggaveamotivatingspeechdespitetheba%bad

-  bad (\leftarrow incomplete rule)

Binary search for end of component (#2)

 PresidentXiJinpinggaveamo%o**bad**

 PresidentXiJ%o**bad**

 PresidentXiJinping%o**bad**

 PresidentXiJinp%o**bad**

 PresidentXiJinpi%o**bad**

 PresidentXiJinpin%o**bad** (\leftarrow bisected end)

Linear search for beginning (#2)

- ✓ PresidentXiJinpin%oog%o~~bad~~
- ✓ PresidentXiJinpin%oong%o~~bad~~
- ✓ PresidentXiJinpin%oing%o~~bad~~
- ✓ PresidentXiJinpin%ooping%o~~bad~~
- ✓ PresidentXiJinpin%onping%o~~bad~~
- ✓ PresidentXiJinpin%oinping%o~~bad~~
- ✗ PresidentXiJinpin%oo~~Jinping%~~bad (← found beginning)

- ✓ Jinping%o~~bad~~ (← incomplete rule)

Binary search for end of component (#3)

✓ Presiden%oJinping%o bad

✗ PresidentXiJ%oJinping%o bad

✓ PresidentX%oJinping%o bad

✗ PresidentXi%oJinping%o bad

Linear scan for beginning (#3)

✓ PresidentX%ooi%oJinping%o bad

✗ PresidentX%ooXi%o Jinping%o bad

✗ Xi%o Jinping%o bad (← complete rule 

Linear scan for beginning (#3)

✓ PresidentX%ooi%o**Jinping**%oo**bad**

✗ PresidentX%oo**Xi**%oo**Jinping**%oo**bad**

✗ **Xi**%oo**Jinping**%oo**bad** (← **complete** rule )

Original input:

“President **Xi Jinping** gave a motivating speech despite the **bad** weather.”

Final output:

Xi + Jinping + bad

Testing keywords one-by-one

- Slow!
- Limited to simple rules!
- INACCURATE!

Our algorithm

- Faster!
- Discover complicated rules!
- ACCURATE!

Weibo has apparently censored Canadian PM Justin Trudeau's name.
Search his name and you'd only see posts from official accounts (Blue V).

And his nickname 小土豆 (little potato) too. So is English word "potato".

建，是世界著名的古城，同时也是个不夜城，当夜幕降临，流光溢彩、色彩斑斓、颇具魅力的美丽夜景一一呈现。

部分素材来源携程社区签约旅行家 @旅行人小土豆 @秋实的城市日记 @爸妈爱6宝 @心心李子园 @银月牙 @旅行人芽芽 @CQ蓝田玉烟 @... More

[See Translation](#)



7



12



1



...

【拙政园 见山楼】

温暖岁末的秋天

摄影 @苏州陈杰-POTATO

#爱上这座城##打卡一个秋天##苏州旅行##苏州
转角遇到爱# @苏州·拙政园

[See Translation](#)



1



5



16



中文(简体) ▾



英语 ▾

翻 译

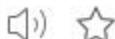
人工翻译

通用领域 | 生物医药 ▾



(1)蔡英文是台湾总统。 (2)习近平是中国国家主席。 (3)唐纳德特朗普是美国总统。

(1) Tsai Ing wen is the President of Taiwan. (3) Donald Trump is the President of the United States.



报错

笔记 ▾

双语对照



Chinese Simplified ▾



English ▾

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Translation



Tone ▾



Widely used phrases





【网络民议】洞庭湖大堤决口合龙，救灾现场变表演舞台

2024年7月09日

大堤决口合龙一刻，现场上演了魔幻一幕：有大量手持红旗的救援人员向推土机聚拢，并不断挥舞旗帜，将夜晚的救灾现场搞出了舞台效果。这一红旗招展的画面引发了大量网民的吐槽，称之为“丧事喜办”的又一经典场景。

18,863 People

505,903 general rules

鸡巴法轮李洪志藏独阴茎肛交阴道淫水台独小穴疆独口交阴唇法 轮功龟头共匪性交做爱真善忍肉棒江泽民屁眼邓小平傻逼胡锦涛强奸阴蒂反共射精大纪元肉洞fuck操你妹子达赖阴毛共产党温家宝操你妈自焚精液阳具妓女性爱游行六四阴户奶子李鹏轮奸肉棍大法插你乳交作爱吴邦国罗干色情民运我操丁子霖六合彩冰毒学潮打炮江 贼民赵紫阳黄菊三级片共狗摇头丸操逼轮功淫荡郭伯雄西藏独立叫床 鸡八一夜情东突民进党骚货贱人中共毛泽东太子党贾庆林李登辉阴部一中一台天安门事件淫穴台湾独立傻B手淫骚逼援交美国之音 贱货情色荡妇自慰兽交曾庆红吕秀莲迷药李宏志江戏子催情药干你李长春颜射尻新疆独立换妻示威共党发轮他妈的春药日你乳房朱镕基洪志镇压暴动柴玲赤匪发论乱伦卖逼性欲法轮大法狂操群交干你娘干死你高自联朱容基发伦吴官正睾丸江猪烂逼陈水扁抽插热比娅奸淫胡耀邦海洛因贱逼暴乱习近平操他俞正声肛门胡紧掏回良玉卖淫李瑞环蒙独性奴狗操回民暴动江猪媳淫酱猪媳民主窃听器我日江八点江折民 钓鱼岛卖比僵贼民博讯华建敏曹刚川毛厕洞明慧网李大师江青八九你妈的毛贼东成人片迷幻药曾培炎李岚清学运尉健行你妈迷魂药三唑仑国民党杂种中华民国周永康靠你妈鸡吧sex一党专政人民报多维大参考造反发骚新唐人河殇你妈逼北京之春神通加持法阴水台湾狗 shit强暴退党鸡奸一党专制天安门日你妈静坐东北独立政变独立台湾会法 仓贺国强钱其琛操比佛展千手法王刚骚穴内射江独裁麻醉枪反革命falun刘云山反华烂比迷奸药阴核张德江乔石十八摸迷奸伊斯兰法功王丹小鸡鸡阿扁六四事件胡锦涛陈希同成人电影巨乳爱液烂货法愣马英九保钓屠杀精子卖国干她乳头李克强转法轮法伦黑社会包皮二逼你娘大逼丁关根干他主席淫靡黄色电影妈批迟浩田吹箫基督徐才厚江主席肉缝支那办理文凭激情电影操蛋公安嫖娼民国乱交 扁拉登老虎机藏青会魏京生 龟公华国锋溫家寶吴仪肉穴开苞逼样陈良宇minghui出售手枪戴海静逼毛三陪麻醉药林彪侦探设备王兆国新生网嫩穴干你妈王乐泉高潮性虐待拍肩神药正见网黄色中国之春我操你狗日蜜穴 专制台湾国四川独立打飞机专政出售假币大麻翁反政府大紀元性虐周恩来大 鸡巴本拉登出售枪支刘淇西藏无界浏览器江核心淫乱鸦片两个中国妈的猪操刘少奇枪决女犯阴道军长发威密穴毛一鲜波霸肉欲车仑操日逼宋祖英；去女优梁光烈亂倫性高潮蒙古独立阴门发正念妈逼淫叫淫贱狗娘裸聊处女激情小电影虐待上海帮猪聳畸黄色小电影阳痿官商勾结昏药胡紧套自杀手册色欲发抡功明慧毛片强硬发言陰唇动乱后庭买卖枪支穆斯林锦涛禁书赌球K粉九评反党幼交自制手枪自杀指南陰戶A片bitch王宝森小参考达赖喇嘛偷拍奸操她淫妇私服发论功淫液淫秽胡景涛他妈发伦功张立昌李红痔王岐山大法弟子枪决现场特码renminbao淫娃蒋介石发论公狗b基地组织傻比peacehall办理证件煞笔朱德枪支弹药zhengjian 月插我破处共军新党方励之回教风骚人大陈至立中南海淫汁色诱投毒杀人群奸变态反动坐台蒋经国贱比希特勒去你妈的叶剑英人权民猪法輪功唐家璇血腥图片陰蒂张小平花花公子鲍彤封从德政府新华内情官逼民反尻外挂政治中国猪嫩 b肉壺高校群体事件 18禁异议人士牛逼监听王你爸反封锁技术发抡招妓破鞋麻醉乙醚TMD喷精赌博李先念激情靖国神社革命可卡因吗啡网特孙中山庆红高丽棒子輪功远程偷拍黑手党一本道严家其推油政治犯王八蛋 亲民党毛主席陰莖daijuyan分裂张春桥李铁映江流岷马克思骚女麻醉钢枪共产主义天葬江澤民日死你狗卵子独裁布告苏机丘社会新闻封锁萨德王安門電占政治兵对派狂插鸡鸡sh在土耳其斯坦工农江赋萨达姆子女任耶鲁单廢门教姐巴熟女私处泡

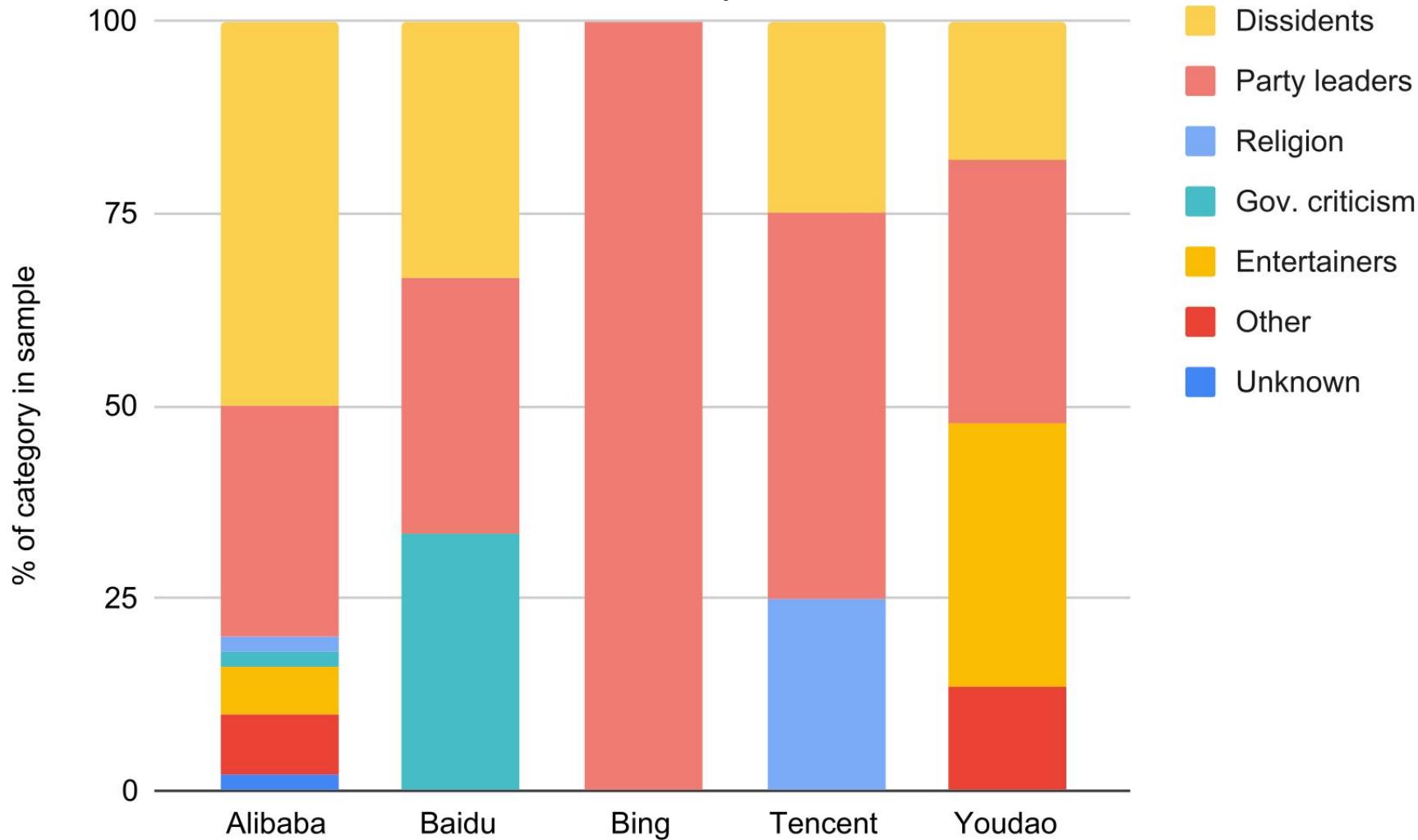
505,903 general rules

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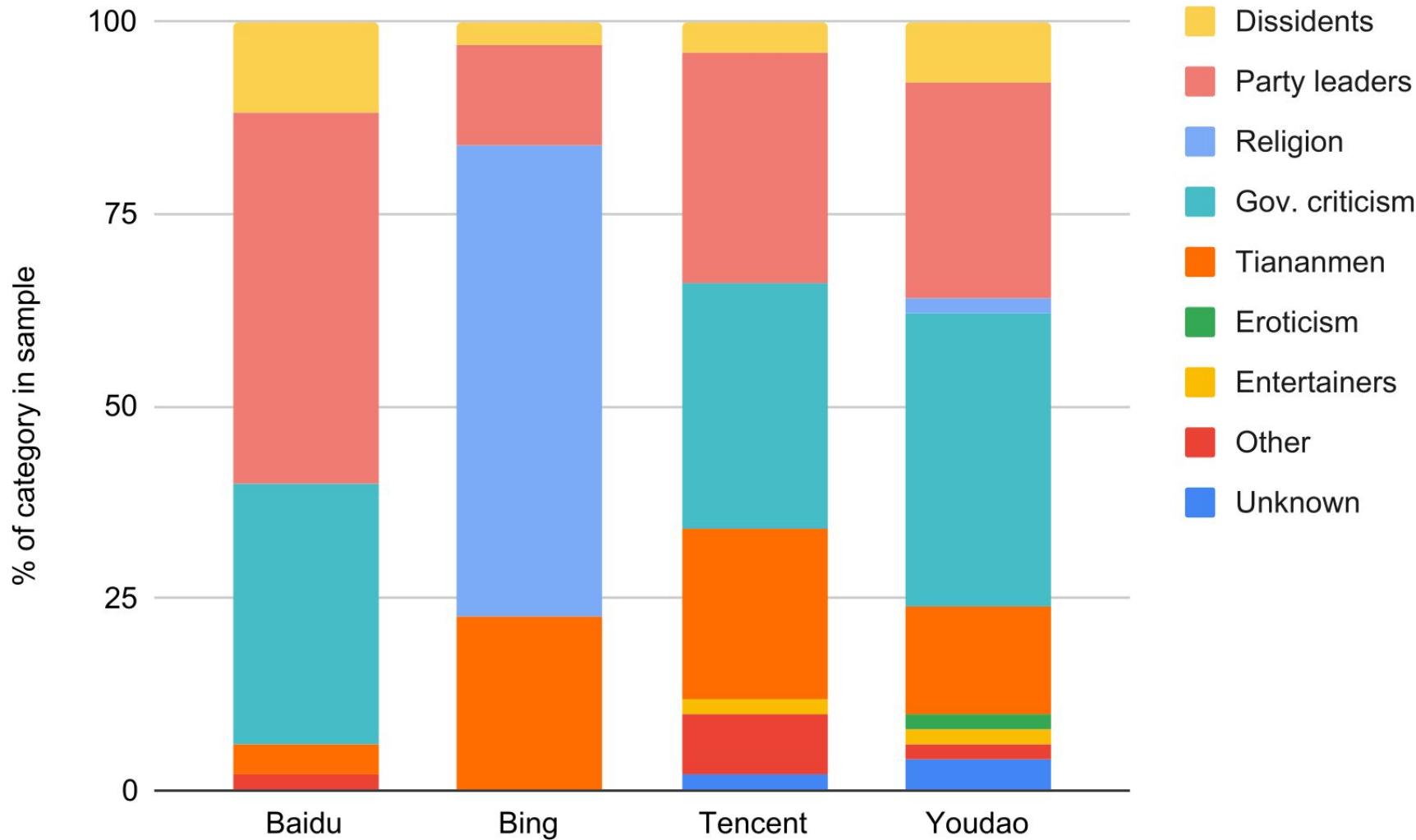
Results

Service	Detection mechanism	# (people)	# (general)
Alibaba	Keyword combination	344	N/A
Baidu	Keyword	3	131
Bing	Regular expression	3	31
Tencent	Keyword combination	4	2,452
Youdao	Multiple types	45	9,414

People



General



Youdao's ML rules...

胡主 + 胡錦 + 錦濤 (Lord Hu + Hu Jin + Jintao, an unintuitive rule targeting Hu Jintao criticism)

他操操你操操蛋操朝鲜操比毛操 (not translatable, but contains the characters 操 “fuck” and 毛 “Mao [Zedong]”)

螺 + 螺 + 螺 + 螺 + 螺 + 螺 + 嬉 + D + 啜 + 大 (screw + screw + screw + screw + screw + screw + [a homophone of Xi] + D + [a homophone of 大] + 大)

Practical implications

- Microsoft Bing had less censorship
- Although most extreme method, also most obvious method of censorship
- Bing censored fewest categories
- Bing being better — far from a foregone conclusion!

Chinese translation platforms analyzed

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Questions?

All discovered censorship rules:

<https://github.com/citizenlab/chat-censorship/tree/master/translator>