### Part 5

### **Demos and Applications**

NLP Approaches to Computational Argumentation – ACL 2016 Tutorial

# Many potential applications, in multiple domains

- Education enhance persuasive essay writing
- Legal enhance preparation for court
- Finance swiftly understand pros/cons of an examined investment
- Healthcare understand pros/cons of a suggested prognosis
- Journalism quickly dive into a new topic, by reviewing pros and cons
- **Politics –** enhance interaction of citizens with government representatives
- More...



## **Example: From Search Engine to Research Engine**

- Problem statement: given a topic, swiftly generate high quality content, allowing to take more informed decisions.
  - Approach: model the content-generation process and provide the user with most relevant content at the right timing
    - An example shall smoking be banned?



# Start with definitions and background

Related concepts and background   Smoking should be banned Prev Next					
	Definition				
	Smoking bans (or smoke-free laws) are public policies, including criminal laws and occupational safety and health regulations, that prohibit tobacco smoking in workplaces and other public spaces.				
	Smoking is a practice in which a substance is burned and the resulting smoke breathed in to be tasted or inhaled. Most commonly the substance is the dried leaves of the tobacco plant which has been rolled into rice paper into a small, round shuder called a "cigarette". This is primarily practiced as a route of administration for what has come to be termed "recreational drug use" because the combustion of the dried plant leaves releases active substances into the body.				
	The history of smoking dates back to as early as 5026 BC in shamanistic rituals. With the arrivals of the Europeans in the 16th century, the consumption, cultivation, and trading of tobacco quickly spread.				
	Smoking in China is prevalent, as China is the world's largest consumer and producer of tobacco:[REF] there are 350 million Chinese smokers [REE] and China produces 42% of the world's cigarettes [REE]. The China National Tobacco Corporation is by sa China generating be ubiquitous gift accept dialog with (millions of?) users				
	Religious views on smoking vary widely.				

# **Continue with suggesting relevant claims**

#### Claims | Smoking should be banned

	Supporting Claims	Relevance▼	Opposing Claims Relevance
	A true breakthrough came in 1948, when the British physiologist Richard Doll published the first major studies that proved that <b>smoking could</b>		Some also argue that <b>smoking works to reduce the side effects of</b> <b>antipsychotics</b> .
	cause serious health damage [REF].       Select         More recently, rabbinic responsa tend to argue that smoking is prohibited as self-endangerment under Jewish law and that smoking in indoor       self-endangerment under Jewish law and that smoking in indoor		The prominent scholar Yusuf al Qaradawi argues that <b>smoking is no</b> longer an issue of dispute among Islamic scholars due to the knowledge of health risks.
	However, the research in this area is limited and the results are conflicting;		Though smoking may help relieve symptoms of schizophrenia, smoking also counteracts the effects of antipsychotic medication.
	disease.		Some rulings suggest that smoking is permitted insofar as it may enhance the fulfillment of one's (religiously-ordained) duties.
	Other research demonstrates that <b>premature death caused by smoking</b> <b>may redistribute Social Security income in unexpected ways that</b> affect behavior and reduce the economic well-being of smokers and		It is argued that <b>smoking provides structure and activity, both of which</b> <b>may be lacking in the lives of those with serious mental illness</b> [REF].
	their dependents [REF].		The cognitive effects hypothesis suggests that <b>nicotine has positive</b> effects on cognition, so smoking is used to improve neurocognitive
	It is believed that smoking increases the risk of these and other pulmonary and respiratory tract infections both through structural damage and through effects on the immune system.		dysfunction [REF]. Nicotine increases release of dopamine, so it is hypothesized that smoking
	The socioeconomic/environmental hypothesis proposed that <b>smoking</b> results because many people with schizophrenia are unemployed and		helps correct dopamine deficiency in the prefrontal cortex and thus relieve negative symptoms [REF].
	nactive, so smoking relieves boredom.		Following the observation that <b>smoking improves condition of people</b>
	There is some evidence for decreased rates of endometriosis in infertile smoking women.[REF] although other studies have found that <b>smoking</b>		patches had been proposed as a way to treat schizophrenia [REF].
	increases the risk in intertile women [REF].		The rationale for smoking bans posits that <b>smoking is optional</b> , whereas
	One theory argues that <b>the beneficial effects of nicotine on negative</b> symptoms outweigh possible exacerbation of positive sympto		
	The causation model argues that <b>smoking is a primary influence on</b>		

smoking and other drug u factors [REF].

# Relevant pro/con claims are instantly presented, and the user can personalize the output...

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# **Continue with suggesting relevant evidence**

#### Evidence | Smoking should be banned

	Supporting Evidence	Relevance	Opposing Evidence	Relevance
	In 2009, the Public Health Law Research Program, a national programing the Robert Wood Johnson Foundation, published an evider study marising the research assessing the effect of a specific		The prominent scholar Yusuf al Qaradawi argues that smoking is no longer an issue of dispute among Islamic scholars due to the knowledge of health risks.	
	law or policy on public health. They stated that "There is strong evidence supporting smoking bans and restrictions as effective public health interventions aimed at decreasing exposure to secondhand smoke." (1 related claim)		The former British Secretary of State for Health John Reid claimed on smoking in public places may lead to more smoking at home <b>Expert</b>	-
	Smoking increases the risk of symptoms associated with Crohn's disease (a dose-dependent effect with use of greater than 15 cigarettes per day) [REF]. There is some evidence for decreased rates of endometriosis in infertile smoking women, [REF] although other studies have found that smoking increases the risk in infertile women [REF]. There is little or no	_	In a study done by Jennifer O' Loughlin and her colleagues, the first smoking experiences of seventh-grade students were studied [REF]. They found out that the most common factor leading students to smoke is cigarette advertisements. (1 related claim)	-
	evidence of a protective effect in fertile women. (4 related claims) Prev Claim (1/4)	Next	In the US s ate of Indiana, the economic development agency include <b>Event</b> plan for acceleration of economic growth encourse cities and towns to adopt local smoking bans as a means of promoting job growth in communities. (1 related claim)	•
	☑ link to claim ⊚ pro evidence ○ con evidence smoking could cause serious health damage			
	There is some evidence for decreased rates of endometriosis in infertile smoking women, [REF] although other studies have found that smoking increases the risk in infertile women [REF]. (3 related claims)			

# Relevant pro/con evidence – of different types - are presented for the user to consider...

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### **Connecting evidence to relevant claims?**

#### Evidence | Smoking should be banned

	Supporting Evidence	Relevance	Opposing Evidence	Relevance
	In 2009, the Public Health Law Research Program, a national program office of the Robert Wood Johnson Foundation, published an evidence brief summarising the research assessing the effect of a specific		The prominent scholar Yusuf al Qaradawi argues that smoking is no longer an issue of dispute among Islamic scholars due to the knowledge of health risks.	
	law or policy on public health. They stated that "There is strong evidence supporting smoking bans and restrictions as effective public health interventions aimed at decreasing exposure to secondhand smoke." (1 related claim)		<sup>E</sup> C The former British Secretary of State for Health John Reid claimed that restrictions upon smoking in public places may lead to more smoking at home [REF]. (1 related claim)	_
	Smoking increases the risk of symptoms associated with Crohn's disease (a dose-dependent effect with use of greater than 15 cigarettes per day) [REF]. There is some evidence for decreased rates of endometriosis in infertile smoking women, [REF] although other studies have found that		In a study done by Jennifer O' Loughlin and her colleagues, the first smoking experiences of seventh-grade students were studied [REF]. They found out that the most common factor leading students to smoke is cigarette advertisements. (1 related claim)	_
2	smoking increases the risk in infertile women [REF]. There is little or no evidence of a protective effect in fertile women. (4 related claims) Prev Claim (1/4)	Next	In the US state of Indiana, the economic development agency included in its 2006 plan for acceleration of economic growth encouragement for cities and towns to adopt local smoking bans as a means of promoting job growth in communities. (1 related claim)	•
	☑ link to claim ⊚ pro evidence ○ con evidence smoking could cause serious health damage			
	There is some evidence for decreased rates of endometriosis in infertile smoking women, [REF] although other studies have found that smoking increases the risk in infertile women [REF]. (3 related claims)			

### Fine grain relations of evidence to a particular claim are highlighted...

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### The generated output can be exported to various applications



### Bridging the gap between end consumers and data owners



### **Conclusions and demo**

- Debate technology engines can be leveraged into real world applications of great practical value
- A synergistic human/machine collaboration?
  - The example of Claim Detection
  - Humans can suggest a small number of relevant claims with high precision
  - Claim detection engines can offer many relevant claims with non-perfect precision
  - Humans can easily filter this list of predicted claims

• The following demo is based on such a collaboration

### **IBM Debate Technology Demo**



**Top Claim and Evidence predictions**