Part 6

Further Challenges and Outlook

NLP Approaches to Computational Argumentation – ACL 2016 Tutorial

Many remaining challenges – from Logos to Ethos and Pathos

- Argumentation involves Logos, Pathos, and Ethos
- Existing work are typically focused on Logos
- Modeling Pathos and Ethos opens a new set of intriguing and important problems
- Towards **Persuasive** NLG?





Many remaining challenges – from Logos to Ethos and Pathos

- Emotion analysis in Computational Argumentation
- Humans typically mix rational and emotions to guide their decisions and actions
- Real world Computational Argumentations systems will need to model emotions, social context, and bias
- Initial attempts are already underway (cf. Benlamine et al, IJCAI-15)





Many remaining challenges - cont.

- Understanding and Modeling 'Argument Quality'
- Can we automatically predict that one claim is more persuasive than another in a given context?
- Can we automatically predict that a particular premise is more persuasive than another in a given context?
- Can we automatically predict that one **argument** is more persuasive than another in a given **context**?
- Several works are trying to pursue such questions (cf. Tan et al, WWW, 2016)





Many remaining challenges - cont.

- Argument Mining and Synthesis over multiple domains and corpora
- Different corpora have quite different characteristics
 - Student essays / Wikipedia articles / news reports / Editorials / More...
- Can we use models learned in Wikipedia to detect argumentative content in newspapers?
- Cross-domain Argument Mining (AI-Khatib et. al, NAACL 2016)
- Argument Synthesis over multiple massive corpora has greater probability of automatically generating new persuasive content – i.e., new arguments







Many remaining challenges - cont.

- Modeling heuristics in debate practice
- Identify claims and evidence in spontaneous speech?
- Going beyond single arguments to strategies of persuasion?
- Modeling the space of controversial topics and their inter-relations



Privacy Nutrition Middle D American Gambling Poverty Growth Assisted Offsets Patriot Offshore Population Pregnancy Punishment Adoption Specie **Bilingual Alcohol** Smoking Socia Warming F Izheimer's Amnest Free Immigrants Prescription Pornography Censorship Suici Underage Technolog **Disorders** Armsp Unemployment Environmentalism Welfare AINSEndangered CationCollapse Alcoholism Sexting Abortion Renewable **BinethicsGlobalization** Minimum Hate Junk Modified **Genocide** Global **Capital Violence** Student S Abuse Wage Animal control Control Attacks Political



Computational Argumentation as an emerging community



Unifying several communities with lots of potential interaction

- Series of Arg. Mining workshops
- AI and Law ICAIL and JURIX conferences
- Computational Models COMMA conferences, CMNA workshops, ...
- More ...

• Rapidly growing attention by major CL, NLP, and AI conferences

- NAACL-16 with an Argumentation dedicated session
- COLING-16, EMNLP-16 'Computational Argumentation' topic
- ACL-16 this tutorial + <u>3rd Workshop on Argument Mining, this Friday</u>

Dedicated international events

- Frontiers and Connections between Argumentation Theory and NLP, Bertinoro, Italy, 2014
- Debate Technologies, Dagstuhl, Germany, 2015
- Natural Language Argumentation, Dagstuhl, Germany, 2016
- More...







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