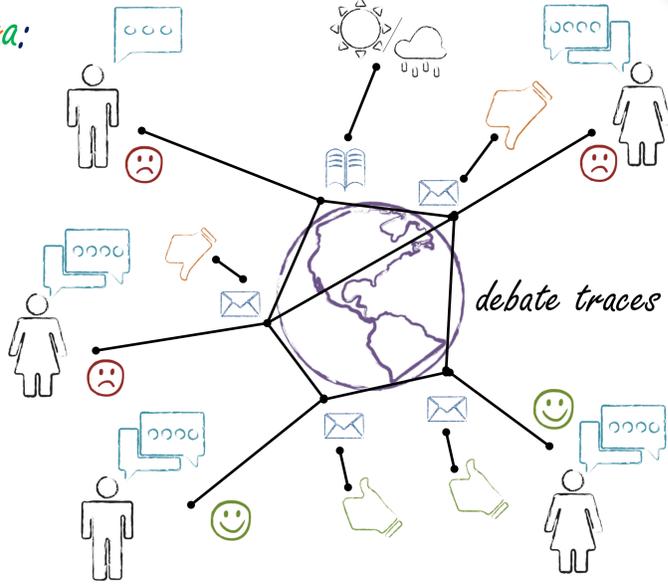


# Emotions in Argumentation

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## Context

Web Agora:



## Problem

Connection between the arguments proposed by the participants of a debate and their emotional status?

- correlation of polarity of arguments and polarity of detected emotions?
- relation between kind and amount of arguments, and the engagement of participants?

## Approach

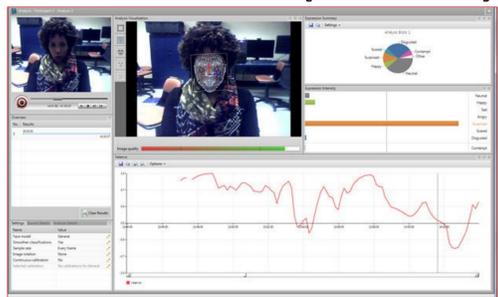
Combine two domains:

- Argumentation theory (abstract bipolar argumentation [Dung, 1995; Cayrol and Lapasque-Schier, 2013])
- Emotion computing (facial expressions & physiological sensors)

## Emotion computing

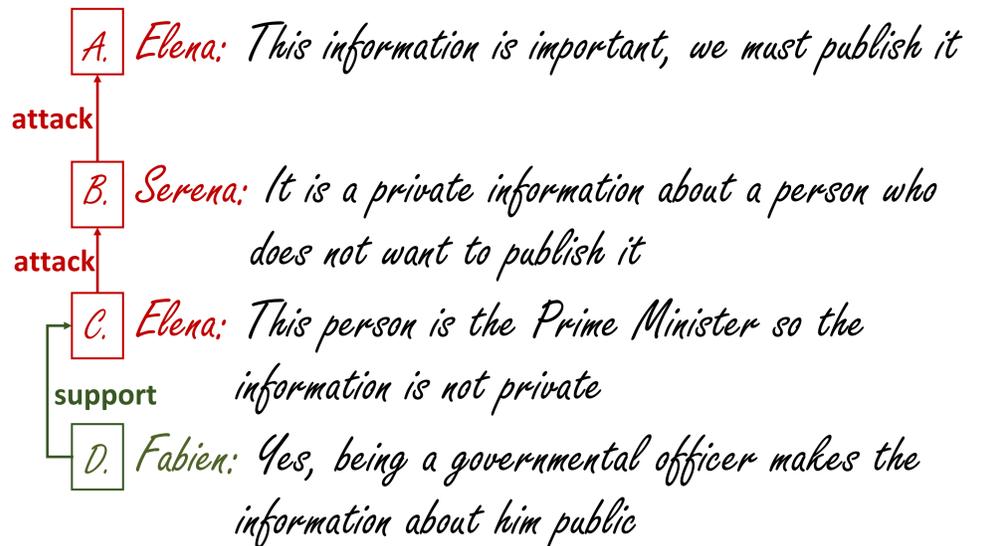
neural network

- ✓ trained on 10 000 examples
- ✓ happy, sad, angry, surprised, scared, disgusted.
- ✓ valence, arousal
- ✓ neutral probability.



[FACEREADER 6.0]

## Argumentation theory



engagement index [Pope et al., 1995]

$$eng = \frac{\theta}{\alpha + \beta}$$

EEG frequency bands

$\theta$  (4-8Hz)  $\alpha$  (8-13Hz)  $\beta$  (13-22Hz)

## Seempad experiments

- ✓ 12 debates - 6 sessions of 2 debates of 20minutes - 4 participants + 2 moderators
- ✓ 12 topics - IRC messages - participants equipped with emotions detection tools
- ✓ bipolar argumentation annotation (sources, arguments, emotions) - 2 independent annotators (91% agreement)

Cohen's kappa 0.82 >> 0.6  $\kappa = \frac{\Pr(a) - \Pr(e)}{1 - \Pr(e)}$

<argument id="2" debate\_id="4" participant="4" time-from="20:30" time-to="20:30">The religion is an independent factor, it should not be a dissociative factor separating people. </argument>

<pair id="2" relation="attack">

<argument id="3" debate\_id="4" participant="1" time-from="20:32" time-to="20:32">The religion gives to his followers hope and help them to overcome some problems of the life so it's not all bad. </argument>

<argument id="5" debate\_id="4" participant="3" time-from="20:32" time-to="20:32">During all the existence of human being, religion makes a lot of issue. It make more hurts than cùrs. </argument>

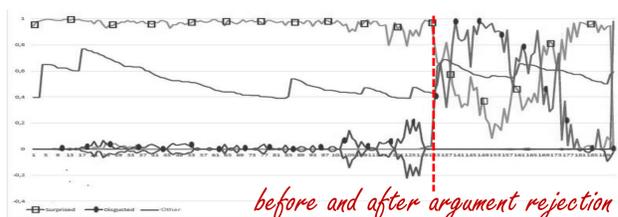
</pair>

<argument id="32" debate\_id="4" participant="3" time-from="20:44" time-to="20:44" emotion\_p1="angry" emotion\_p2="happy" emotion\_p3="surprised" emotion\_p4="angry">Participant4: for recent wars ok but what about wars happened 3 or 4 centuries ago? </argument>

Dataset				
Topic	#arg	#pair	#att	#sup
BAN ANIMAL TESTING	49	28	18	10
GO NUCLEAR	40	24	15	9
HOUSEWIVES SHOULD BE PAID	42	18	11	7
RELIGION DOES MORE HARM THAN GOOD	46	23	11	12
ADVERTISING IS HARMFUL	71	16	6	10
BULLIES ARE LEGALLY RESPONSIBLE	71	12	3	9
DISTRIBUTE CONDOMS IN SCHOOLS	68	27	11	16
ENCOURAGE FEWER PEOPLE TO GO TO THE UNIVERSITY	55	14	7	7
FEAR GOVERNMENT POWER OVER INTERNET	41	32	18	14
BAN PARTIAL BIRTH ABORTIONS	41	26	15	11
USE RACIAL PROFILING FOR AIRPORT SECURITY	31	10	1	9
CANNABIS SHOULD BE LEGALIZED	43	33	20	13
TOTAL	598	263	136	127

## First conclusions

- ✓ H1 : emotional trends can be extracted from debates
- ✓ H2 : arguments, attacks, supports correlated with emotions
- ✓ H3 : the number of arguments is connected to the engagement



Session 3	NB ARG	ATTACK	SUPPORT
Pleasant	0,7067	-0,3383	-0,3800
Unpleasant	-0,7067	0,3383	0,3800
High ENG	-0,6903	-0,3699	-0,1117
Low ENG	-0,1705	0,5337	-0,0615
Neutral	0,8887	-0,0895	-0,3739
Disgusted	0,1017	0,8379	0,5227
Scared	0,2606	-0,4132	-0,7107
Angry	-0,7384	-0,5072	-0,0937

<http://project.inria.fr/seempad/>

