Sentiment Analysis of Social Issues

Mostafa Karamibekr and Ali A. Ghorbani { m.karami, ghorbani }@unb.ca

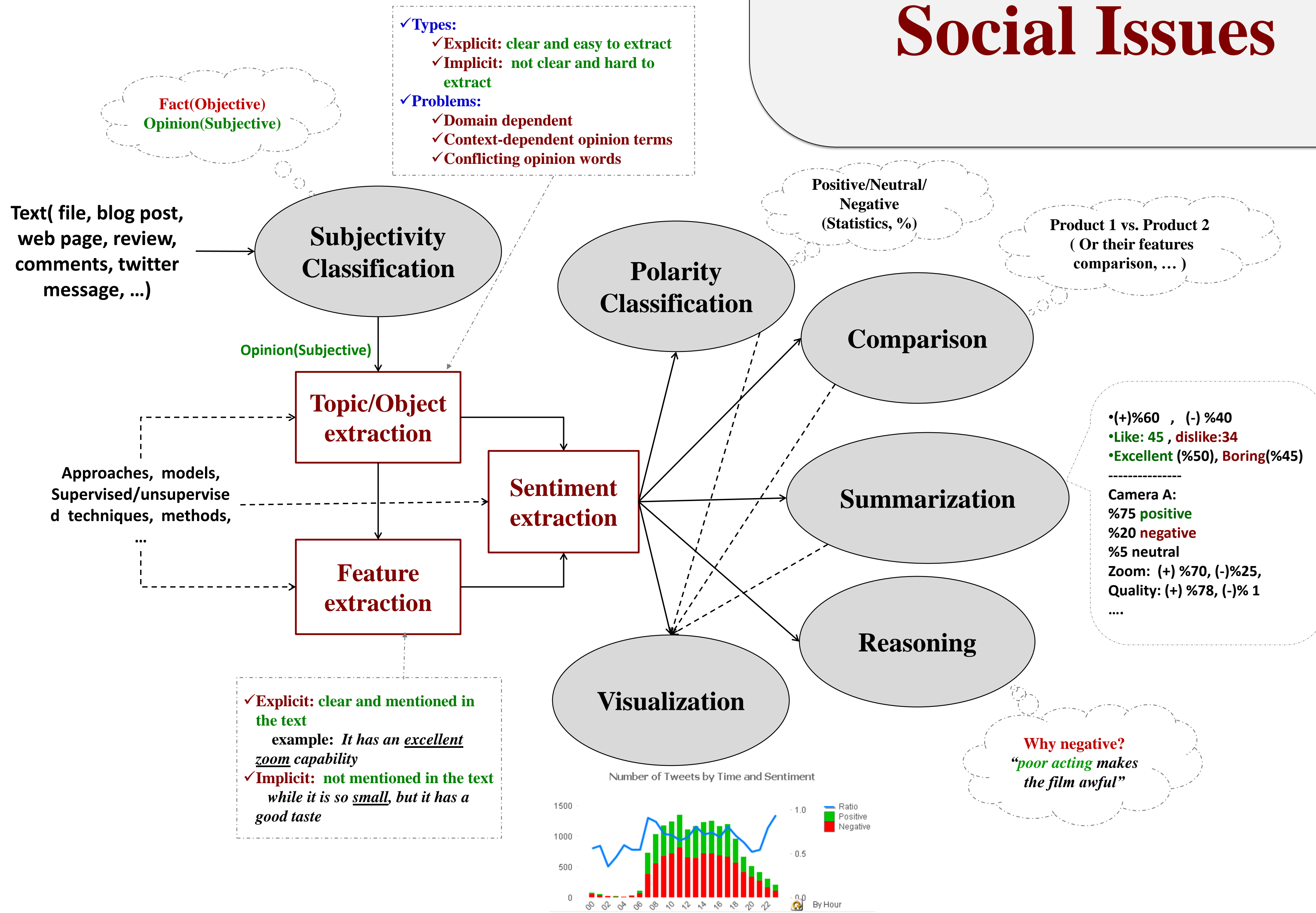**Intelligent & Adaptive Systems Research Group (IAS)**

Introduction

- **Definition:** Sentiment analysis extracts and analyzes opinions expressed by people regarding products or topics.
- **Opinion types:** attitudes, judgments, beliefs, feelings, evaluations, affective/emotional states, or wishes.
- **Area:** an interdisciplinary field which crosses natural language processing, artificial intelligence, and text mining.
- **Applications:** Sentiment classification, comparison, summarization, product and market analysis, and trend analysis.

Concepts

✓Types:
  ✓Explicit: clear and easy to extract
  ✓Implicit: not clear and hard to extract
✓Problems:
  ✓Domain dependent
  ✓Context-dependent opinion terms
  ✓Conflicting opinion words

Fact(Objective)
Opinion(Subjective)

Text(file, blog post, web page, review, comments, twitter message, …)

Subjectivity Classification

Opinion(Subjective)

Topic/Object extraction

Approaches, models, Supervised/unsupervised techniques, methods, …

Feature extraction

Sentiment extraction

Polarity Classification

Positive/Neutral/ Negative (Statistics, %)

Comparison

Product 1 vs. Product 2 (Or their features comparison, …)

Summarization

•(+)%60 ,   (-) %40
•Like: 45 , dislike:34
•Excellent (%50), Boring(%45)

Camera A:
%75 positive
%20 negative
%5 neutral
Zoom: (+) %70, (-)%25,
Quality: (+) %78, (-)% 1
….

Reasoning

Why negative?
"*poor acting makes the film awful*"

Visualization

✓Explicit: clear and mentioned in the text
  example: *It has an excellent zoom capability*
✓Implicit: not mentioned in the text
  while it is so small, but it has a good taste
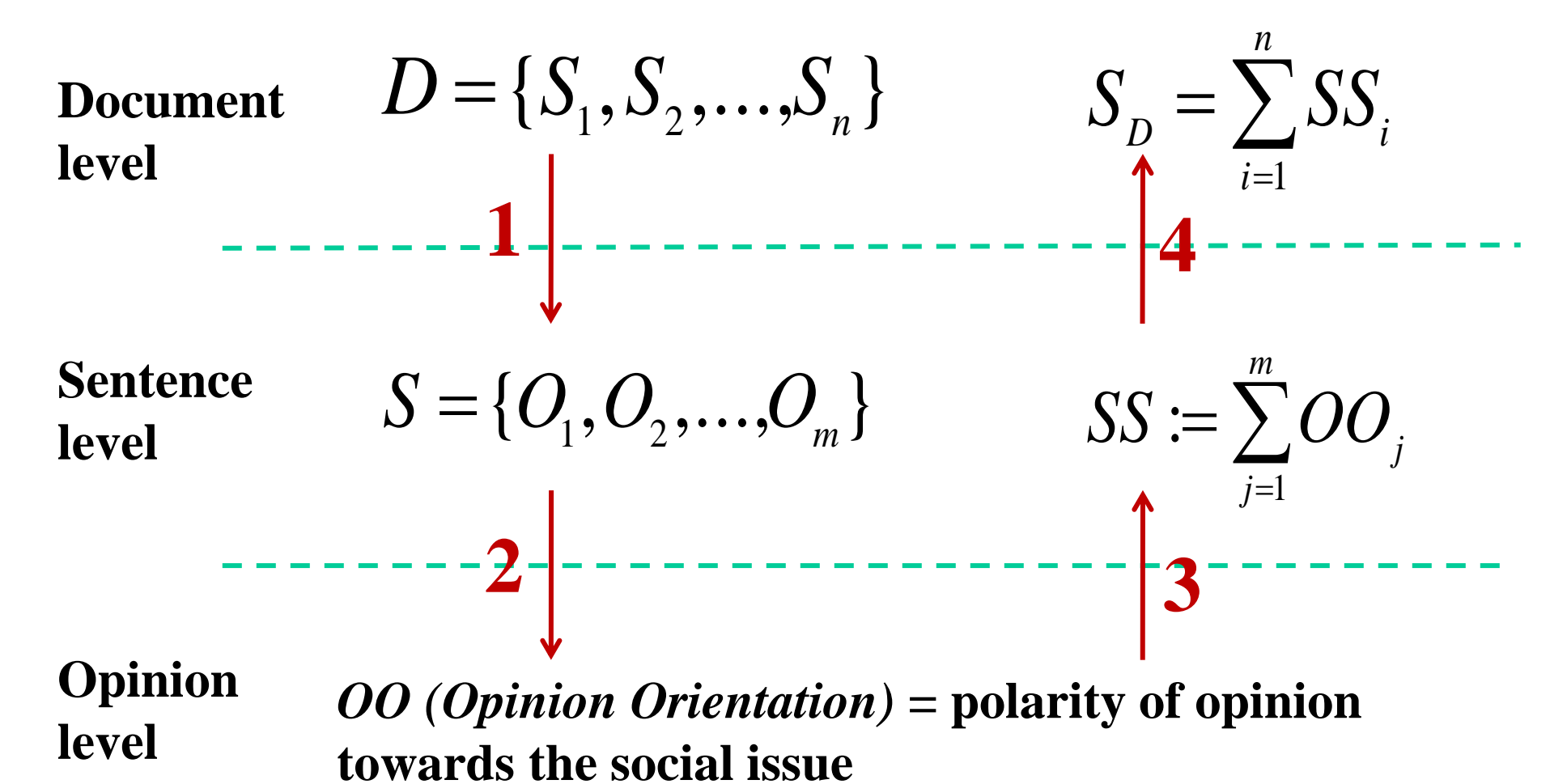
Number of Tweets by Time and Sentiment

Problem and Definitions

A social issue is an issue which relates to people's personal lives and interactions. (Wikipedia)

- A skeletal structure designed to extract and analyze sentiments about social issues in comments, blog posts, reviews, forum discussions, etc.

A
Sentiment Analysis
Framework for
Social Issues

Analysis Levels

Document level
$$D = \{S_1, S_2, \ldots, S_n\} \qquad S_D = \sum_{i=1}^{n} SS_i$$

1   **4**

Sentence level
$$S = \{O_1, O_2, \ldots, O_m\} \qquad SS := \sum_{j=1}^{m} OO_j$$

2   **3**

Opinion level
OO (Opinion Orientation) = polarity of opinion towards the social issue

Knowledge Resources

Opinion Verbs dictionary		*Parser*	
Opinion Terms	Computational Linguistics **Lexical Knowledge**	Computational Linguistics **Syntax Knowledge**	*Pos Tagger*
	Computational Linguistics **Semantic Knowledge**	Graph **Semantic Network, Closeness/ Relatedness**	

Conclusion

- ✓ Evaluated on social issues such as Abortion
- ✓ New Approach for Sentiment analysis
- ✓ Binary/Multi-class classification of sentiments of documents.
- ✓ Enriched dictionaries of opinion terms

Timeline

	Jan. 2012	Feb. 2012	March 2012	April 2012	May 2012	June 2012	July 2012	Aug. 2012	Sep. 2012	Oct. 2012	Nov. 2012	Dec. 2012	Jan. 2013	Feb. 2013	March 2013	April 2013	May 2013	June 2013	July 2013	August 2013	Sep. 2013
Literature review	■	■	■	■	■																
Configuration				■	■	■	■	■													
Implementation							■	■	■	■	■	■	■	■							
Evaluation													■	■	■	■	■				
Finalization																■	■	■	■	■	
Defence																					