A Feature Based Approach to Leveraging Context for Classifying Newsgroup Style Discussion Segments

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Motivation

Information overload in communication media (email, instant messaging, discussion boards)

Solution

Conversation summarization

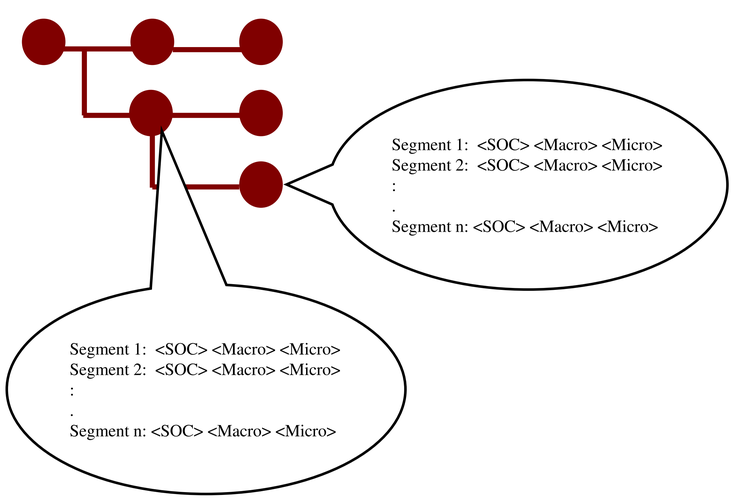
Content + Style + Structure

First Step

Classifying segments of conversation

Goal

- Assessing the quality of newsgroup style interactions using a **multi-dimensional annotation** scheme
- Utilizing the **nature** of threaded discussion forums
  - Novel thread based features
  - Sequential data



Data and Annotation Scheme

Messages are segmented into **idea units** and coded with 3 context-oriented dimensions

- **Micro-level** of argumentation (4 classes): Assessing the quality of individual arguments
- **Macro-level** of argumentation (6 classes): Examining the connection between individual arguments
- **Social Modes** of Co-Construction (6 classes): Referring to the degree of contributions of learners.

Feature Based Approach

Baseline

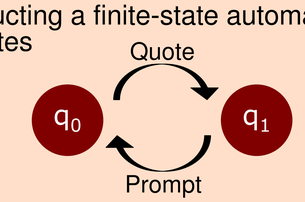
- Un-stemmed unigrams
- Punctuation
- Removing features that occurred less that 5
- Length of each segment

Thread Structure Features

- Deep: the depth in the thread where a message appears
- Parent and Child: **semantic** relation of the current message to the parent message

Sequence-Oriented Features

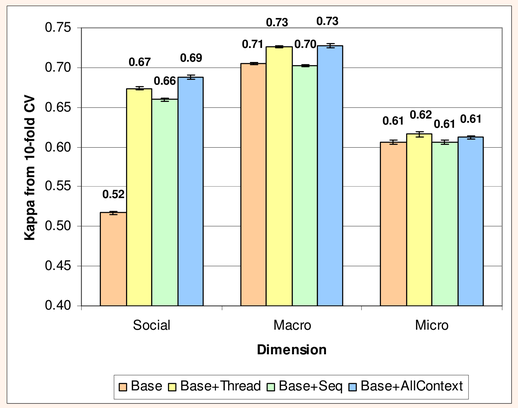
Constructing a finite-state automaton having two states



Evaluation Results

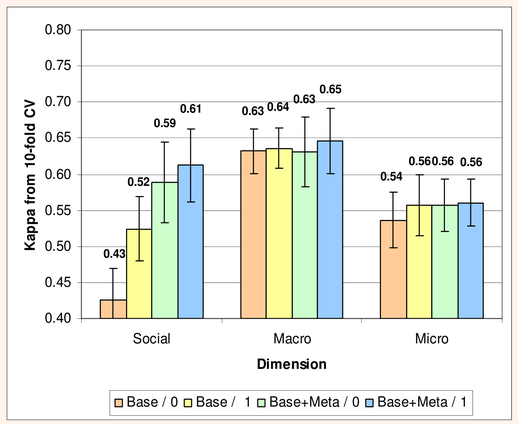
Alternative Feature Sets (SMO)

Achieving a statistically significant improvement by adding context oriented features in all 3 dimensions



Sequential Learning (Collins Perceptron)

Both context features and sequential learning provide some benefit within this task



Note: **Cohen's Kappa Statistic** is a commonly used metric in assessing inter-rater reliability on the defined analyses units among target categories.

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