Artificial Intelligence Seminar

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What AI can do for multi-item sentiment analysis

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Abstract:
Sentiment analysis assigns a positive, negative or neutral polarity to an item or entity, extracting and aggregating individual opinions from their textual expressions by means of natural language processing tools. It then aggregates the individuals' opinions into a collective sentiment about the item under consideration.

Current sentiment analysis techniques are satisfactory in case there is a single entity under consideration, but can lead to inaccurate or wrong results when dealing with a set of possibly correlated items. This can be useful, for example, when a company wants to know the collective preference order over a set of products, or when we want to predict the outcome of an election over a collection of candidates.

We argue that, in order to deal with this more general setting, we should exploit AI techniques such as those used in preference reasoning, multi-agent systems, and computational social choice.
Preference modelling and reasoning tools provide the useful ingredients to model individual's preferences in the most faithful way, while computational social choice techniques give methods to aggregate such preferences which satisfy certain desired properties. Other AI techniques can be very useful as well, such as machine learning or recommender system tools to cope with incompleteness in the information provided by each individual.

We describe a social choice aggregation rule which combines individuals' sentiment and preference information. We show that this rule satisfies a number of properties which have a natural interpretation in the sentiment analysis domain, and we evaluate its behavior when faced with highly incomplete domains. Research done in collaboration with U. Grandi, A. Loreggia, and V. Saraswat

Bio:
Francesca Rossi is a professor of computer science at the University of Padova, Italy. Currently she is on sabbatical at Harvard with a fellowship of the Radcliffe Institute for Advanced Studiy. Her research interests include: constraint reasoning, preferences, multi-agent systems, computational social choice and artificial intelligence. She has been president of the international association for constraint programming (ACP) and is now the president of IJCAI. She has been program chair of CP 2003 and of IJCAI 2013. She is on the editorial board of Constraints, Artificial Intelligence, AMAI and KAIS, and is Associate Editor in Chief of JAIR. She has published over 160 articles in international journals, proceedings of international conferences or workshops, and as book chapters. She has co-authored a book, edited 16 volumes of conference proceedings, collections of contributions, and special issue of international journals, and has co-edited the Handbook of Constraint Programming.

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