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Special theme:

Future Internet Technology

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scale. This scale may be in the form either of an ordered set of numerical values (eg one to five stars), or of an ordered set of non-numerical labels (such as 'poor', 'good', 'very good', 'excellent'). We also focus on multi-faceted rating of product reviews, where the review of a product (eg a hotel) must be rated several times according to several orthogonal aspects (eg cleanliness, location etc).

We focus on generating the vectorial representations of the reviews that must be given as input to the learning device used to generate a review rater, rather than on the learning device itself (for which we use an off-the-shelf package). These representations cannot simply consist of the usual 'bag of words' used when classifying texts by topic, since classifying texts by opinion (which is the key content of reviews) requires a much subtler approach. Two expressions such as "A great hotel in a horrible town!" and "A horrible hotel in a great town!" would receive identical 'bag of words' representations despite expressing opposite opinions.

We have focused on three aspects of the generation of meaningful representations of product reviews: (i) the extraction of complex features based on speech patterns; (ii) making the extracted features more robust through the use of a lexicon of opinion-laden words; and (iii) the selection of discriminating features through techniques explicitly devised for ordinal regression (an issue which until now has received practically no attention in the literature). In order to test the techniques we have developed, we crawled the Web to create a dataset of hotel reviews. The dataset is now available to the research community for experimentation. Several experiments that we have run on it confirm that a combination of these three techniques provides the best performance on this particular type of data.

The system we have realized could work as a building block for other larger systems that implement more complex functionality. For instance, a Web site containing product reviews whose users only seldom rate their own reviews could use our system to learn from already rated reviews how to rate the others; another Web site containing only unrated product reviews could learn to rate its own reviews, from the rated reviews of some other site.

Link:
http://nmis.isti.cnr.it/sebastiani/Publications/ECIR09c.pdf

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More on Mobile Telephones and Our Health

by Harry Rudin

For well over two years, it has been hoped that the international investigation known as the Interphone Study would shed much-needed light on the question of whether mobile phone usage is a threat to our health. While the final results are not yet in, an excellent evaluation of the current status of the study has just been published. The indications are that if there are health dangers, they likely come from intensive, long-term use.

The title of this comprehensive, well-written and easily digestible report is 'Comments on the Interphone Study'. It is available in German, French, Italian and English and was written by Gregor Dürrenberger, Jürg Fröhlich and Heinz-Gregor Wieser in January 2009. The authors are with, respectively, the Swiss Research Foundation on Mobile Communication, the Laboratory for Electromagnetic Fields and Microwave Electronics - ETH Zurich, and the Department of Neurology, University Hospital Zurich, all in Switzerland. The report was published under the auspices of the Research Foundation for Mobile Communication and the Krebsliga Schweiz, a Swiss organization for cancer research and education.

The topic is controversial, delicate and complicated, to the point that the many researchers involved in the Interphone Study have been unable to reach an overall conclusion. Many individual national studies have been published however, and the cited report describes these results with remarkable clarity. The hope remains that there will eventually be a single report which will combine the many national studies, thus including more individual investigations and so leading to a more robust result. Statistically speaking, individually the national studies examine an insufficient number of cases to reach a solid conclusion. The reasons for this are also explained in the report.

Is mobile phone usage a threat to our health?

The goal of the Interphone Study was to examine the potential link between mobile phone use and the risk of developing four different kinds of tumours in the head of the user. The approach used was epidemiological, using case-control studies. People were identified who had one of the four kinds of tumours and an investigation was made into their mobile phone use. The results were compared with those of demographically similar people who had not developed a tumour. The goal was to establish a connection between mobile phone use and the development of these tumours.

Results

Since the individual national studies involved relatively small numbers of people, the certainty of the conclusions, statistically speaking, is questionable. As an example, in the case of two tumour types, there is (very weak) statistical evidence that mobile phone use decreases the risk of tumour development, a rather counter-intuitive conclusion. Another problem is the difficulty that study participants had in accurately estimating their mobile phone usage several years in the past.

Tumours take in the order of tens of years to develop, meaning there is great interest in 'long-term users'. The Interphone Study has its own definition of long-term mobile phone users: these are people with a 'regular' use pattern (at least half an hour per week) over a period of ten years or more. For these users there is an indication that longer exposure leads to greater risk based on the observation that tumours tend to develop on the side of the head where the user holds his or her phone. The difficulty is that the study overall has only a small number of users and an even smaller number of long-term users. Thus the statistical strength of the conclusion is still weaker in the case of long-term users.

It is worth noting, however, that today's younger generation spends hours per day with their mobile phones pressed to their heads, exposing themselves to much more radiation than the 'regular' users investigated in the study.

The brevity of this summary prevents us from exploring many interesting details, and the reader is encouraged to study the sixteen-page report itself (see link below).

An Aside

Quite independently of the Interphone Study and other studies of mobile-phone use relating to cancer, there have been a number of studies relating to mobile-phone use and automobile accidents. Here the statistical certainty is much greater. The results show that using a mobile phone while driving (independently of whether or not it is a hands-free phone) increases the chances of having an accident by a factor of four: about the same increase as driving with a blood alcohol concentration at the legal limit! One such recent study, published in 2006, comes from Professor David Strayer and colleagues at the University of Utah (see link below).

Conclusions

The mobile phone is a useful, convenient, even life-saving device, but it should be used responsibly and carefully:

- keeping the phone away from your body is a good idea; this can be achieved by using a headset
- putting the phone into stand-by or sleep mode reduces exposure to a negligible level
- avoiding prolonged conversations reduces exposure.
- using a mobile phone in a metallically enclosed space such as a car, bus or elevator (or wherever reception is weak) tends to increase exposure (since the phone generally increases its radiated power to compensate for poorer reception)
- chances are that children are more endangered by mobile-phone radiation than adults because their skulls are more permeable to electromagnetic fields. Hence if dangers exist, they might well be greater for children
- driving while carrying on a mobile-phone conversation is dangerous both for the user as well as for other people on the road.

Links:

Interphone study:
http://www.mobile-research.ethz.ch/var/Comment_Interphone_update01.pdf

University of Utah study:
http://www.psych.utah.edu/AppliedCognitionLab/HFES2006.pdf

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The Open Wall: A Software-Intensive Art Installation

by Letizia Jaccheri

The Open Wall is a computer-based art installation developed by students, researchers and artists. The Open Wall enables its developers and observers to engage in dialogue that leads to increased understanding about creativity, cooperation, openness and authorship of software-intensive processes and content.

The SArt project is conducted by the software engineering group in the Department of Computer Science at the Norwegian University of Science and Technology. We study the intersection of software and art in order to improve our knowledge of creativity, cooperation, openness and authorship in software-intensive processes and content. The Open Wall project is one of SArt's projects.

In 2005 a group of architecture students built an experimental house with an LED façade; the house was intended to last for a year. The students asked the Department of Computer and Information Science (CIS) for help and cooperation. Hardware design was the most important task when the installation was built for the first time. When