Lisbon Machine Learning School 2012: “Taming the Social Web”

On July 19 to 25, the 2012 edition of the Lisbon Machine Learning School (LxMLS), took place at Instituto Superior Técnico (IST), organized by Instituto de Telecomunicações, with the collaboration of IST and the Spoken Language Systems Laboratory of INESC-ID, and with generous support from Google and Priberam.

LxMLS is targeted at researchers and graduate students in the fields of machine learning (ML), natural language processing (NLP), and computational linguistics, as well as at industry practitioners desiring an in-depth understanding of these subjects. A key feature of LxMLS is its practical component: the participants spent several hours per day implementing and experimenting with the techniques covered in the tutorial lectures. The 2012 edition of LxMLS had 110 participants from more than 20 countries, mostly graduate students, but also from industry.

As in the first edition, LxMLS 2012 included tutorial lectures by leading experts on ML and NLP, covering a range of fundamental ML concepts and tools that are important for solving NLP problems in the analysis of Web data. Furthermore, this second edition was sub-titled "Taming the Social Web", which was reflected on talks such as "Text and Social Context", by Noah Smith (Carnegie Mellon University, USA), "Social Meanings From Social Media", by Jacob Eisenstein (Georgia Institute of Technology, USA), "We Mine Your Life", by Maarten de Rijke (University of Amsterdam), "Understanding All The World's Languages", by Slav Petrov (Google, USA), and "Recommender Systems At LinkedIn", by Paul Ogilvie (LinkedIn, USA).

INTELE, a one week summer course Introducing Telecommunications to 10th and 11th grade secondary school students was IT first attempt in Lisbon at this type of cooperation with CIÊNCIA VIVA.

Mornings were devoted to (partly) unravel the mysteries of using the electromagnetic field to carry information, both in analogue and digital form. Afternoon hands-on sessions started with learning how to solder and once this technique was mastered progressed to assemble a very simple AM crystal radio receiver with a coil, a variable capacitor, a diode, a capacitor and a high impedance headset. The antenna was simply a 10 m wire dropped from a window. In spite of its simplicity it worked pretty well.

A more complex portable FM receiver was the piece de resistance completed by all pupils in an afternoon session.

Congratulations to Custódio Peixeiro, the soul behind INTELE, for his enthusiasm and dedication and to all IT researchers who helped making this event a success.

Carlos Salema
PROJECT SNAPSHOT

Spatially confined RFID detection with a metamaterial grid

Radio Frequency Identification (RFID) is an increasingly popular technology that enables detecting objects associated with a unique identification code. Such information is encoded in an electronic chip attached to an antenna – the RFID tag. One of the current challenges in the Ultra-High Frequency (UHF - 860-960MHz) RFID detection is the confinement of the detection region to prevent unwanted readings of tags located outside a desired interrogating volume. This is of particular importance in scenarios where the RFID system must be operational in open environments - for example the point access control to a room - and where it is not feasible to place physical barriers to block the radiation field. Without the confinement, the UHF RFID system may grant undesired accesses when an authorized user walks inadvertently nearby the reader.

Our strategy to approach this problem is based on the apparently paradoxical concept of a “radiationless antenna”. The electromagnetic field emitted by a source is formed by a radiation far-field and by a near-field. The far-field is associated with a flow of electromagnetic energy away from the source, and can be potentially detected at long distances. Can we get rid of the radiation field? This is where metamaterials come into play: with the help of a metamaterial grid formed by an array of metallic wires it is possible to block the radiation field of a conventional dipole antenna, obtaining in this simple manner a “radiationless antenna” at long distances. Can we get rid of the radiation field? This is where metamaterials come into play: with the help of a metamaterial grid formed by an array of metallic wires it is possible to block the radiation field of a conventional dipole antenna, obtaining in this simple manner a “radiationless antenna”. Despite the absence of the far-field, the radiationless antenna can still be coupled to the RFID tag through the near-field. The near-field has essentially a reactive nature and decays relatively fast away from the source. In case the radiationless antenna stands alone in free-space, it does not radiate any power. However, when an RFID tag is placed in the close vicinity of a radiationless antenna, it creates a reflected near-field wave that allows for a power flux between the antenna and the tag, with no direct radiation from the reader antenna to the far-field! We have recently experimentally demonstrated this concept, proving that radiationless antennas allow for sharp interrogation regions in RFID systems, even when the tag is masked by small objects.

Mário Silveirinha

Agenda

♦ 20th Anniversary of IT
A series of local events are being held in sites and branches from IT to celebrate its 20th anniversary. All the information is regularly updated at:
URL: www.it.pt/20years

♦ Workshop: “Emergent Technologies for Future Wireless Systems”
The workshop will be held on September 12, 2012 at Instituto de Telecomunicações (IT) in Aveiro. Registration is free, limited to the available seats and will be open until September, 5th.

Newsflash

♦ Instituto de Telecomunicações on the social networks

IT has created its official page on Facebook, which is regularly updated with fresh news and information. We invite you all to join us and contribute with your posts and comments. IT is also on Flickr. Follow the links below or the link buttons on the front page of IT website.
URL: https://www.facebook.com/pages/Instituto-de-Telecomunicacoes/316833368411545
URL: http://www.flickr.com/photos/institutodetelecomunicacoes_portugal

♦ Book: Emerging Communication Technologies for E-Health and Medicine
By Joel J. P. Coelho Rodrigues, researcher at IT (IGI -Global Publishers, Hershey, PA, USA, April 2012). The book is a source for the advancement of knowledge, application and practice in the interdisciplinary areas of healthcare, e-health, sensors, biomedical engineering and telemedicine.