

Curriculum Vitæ et Studiorum

Personal Information

Surname, Name

Nardini, Franco Maria

Short Bio

Franco Maria Nardini is a researcher at Italian National Research Council in Pisa, Italy. He received the Ph.D. in Information Engineering from the University of Pisa in 2011. His research interests focus on Web Information Retrieval (IR), Data Mining (DM), and Machine Learning. He authored more than 50 papers in peer-reviewed international journal, conferences and other venues. He is also member of the program committee of important conferences in IR and DM like ACM SIGIR, SIGKDD, CIKM, WSDM, etc. He taught courses on Web mining and parallel computing in the Ms.C. Computer Science and Telecommunication Engineering courses at the University of Pisa. He is currently teaching computer architectures in the Ms.C. Telecommunication Engineering at the University of Pisa. He is co-recipient of the ACM SIGIR 2015 Best Paper Award and of the ECIR 2014 Best Demo Paper Award.

Bibliometric Data

	Citations	h-index	i10-index
Scopus	403	11	-
Google Scholar	689	14	21
Google Scholar (from 2014)	550	13	18

Work Experience

Research Positions

Dates

October 2012 – Ongoing

Name and address of employer

Istituto di Scienza e Tecnologie dell'Informazione "A. Faedo" (ISTI)
Italian National Research Council (CNR), Pisa, Italy.

Occupation or position held

Researcher

Main activities and responsibilities

Research activities here covers the cross-cutting concept of *High Performance Computing*, mainly focused on *(Web) Information Retrieval*, *(Web) Data Mining* and *Machine Learning*. The main research activities during this period are:

Machine learning for Web search. To improve the quality of results produced and the time needed to obtain them, modern Web search engines extensively adopt machine learning techniques to understand how much a document is relevant w.r.t. the user query. State of the art approaches employ “two stage” architectures with different tasks: the first stage, efficient but not very effective, aims at retrieving a high number of candidate documents while the second stage, slower but more precise, aims at refining the list of documents provided to the user. In this context, I have contributed with the study and the development of a new algorithm, named QuickScorer, allowing to efficiently employ machine-learned rankers to score Web documents. Moreover, we study new classes of features, i.e., signals representing the relevance between a query and a given document, for modeling global dependencies between documents in the list of candidate results to score. We also propose a comprehensive study of the efficiency/effectiveness trade-offs of state-of-the-art “learning to rank” approaches. We do it by developing QuickRank, a parallel C++ library of machine learning algorithms for Web Information Retrieval (<http://quickrank.isti.cnr.it/>). We prove that QuickRank is effective in training models to be used in real-world search engine. It is currently used within istella (<http://www.istella.it>), an Italian Web search engine as the technology to build the machine-learned models used in production to rank candidate documents in response to a user query.

Mining logs of Web search engines. Modern Web search engines extensively employ query logs, i.e., records of past user activities for enhancing the satisfaction of their users by improving the effectiveness of their query processors. We contribute in the field by defining a new query recommender system that exploit knowledge extracted from query logs for recommending queries to users of Web search engines. The proposed technique, named SearchShortcuts, advances previous state-of-the-art approaches by effectively producing recommendations for rare or previously unseen queries (<http://searchshortcuts.isti.cnr.it>). This contribution was the first technique in the field solving this important issue affecting previous state-of-the-art approaches. I also contribute in the field by defining a new machine learning technique aiming at shortening user search sessions by focusing on how complex users’ traces of interaction (i.e., documents clicked, dwell time, user sessions) could be exploited for enabling search engines in predicting the right information need of a user during a query session.

Smart Tourism. In the last years important effort have been spent in improving the management and the sustainability of the mobility in urban scenarios through a paradigm shift that focuses on the citizen as the primary user and contributor of mobility services. These efforts represent the first experience of mobility 2.0, where the services are built by considering the user as an active element in the process of managing the urban mobility. By providing citizens with real-time information on the urban mobility, they are able to re-schedule her movements. On the other side, tourists become sensors for measuring flows, at the same time, providers of added-value content. In this scenario, I contribute with a study of new algorithmic solutions for predicting the movement of tourists in the city. We have proposed a new predictor of movements and we proved to be better than previous state-of-the-art solutions. The predictor is based on machine learning techniques. Moreover, we contribute with a study of new algorithmic solutions for generating personalized tourist plans in a city. In this context, we have proposed a new unsupervised method of generating tourist paths. The technique allows to define tours taking into account the preferences of tourists and a time of the visit. This research activity lead to several publications and a demonstration service (<http://tripbuilder.isti.cnr.it>).

Education and Training

Date
Title of qualification expected
Occupational skills covered

Organization
Level international classification

May 11, 2011

Dottore di Ricerca in *Ingegneria dell'Informazione*.

Ph.D. Thesis title: *Query Log Mining to Enhance User Experience in Search Engines*.

Supervisors: *Prof. Luca Simoncini, Dr. Fabrizio Silvestri*.

Research interests: *Web Information Retrieval, Data Mining*.

Department of Information Engineering, University of Pisa, Italy.

Doctor of Philosophy degree (Ph.D.) in Information Engineering.