andrea vaccari

Andrea Vaccari investigates people's lifestyle and sentiment
through their interaction with digital technologies, pervasive systems and the built environment

Education

ongoing — **Ph.D. Computer Science**, *GPA: 4.0/4*, University of Illinois at Chicago, USA

Thesis: Inferring the Consumer Confidence in the Economy from Multimodal Social Content and Behavioral Data. Supervised by Prof. Bing Liu, the thesis will present data mining techniques to automatically infer the consumer sentiment on the state of the economy from a very large human behavioral data set, which includes spending behaviour, mobility and communication patterns, and unbiased opinions from online comments and reviews. The work aims to offer an alternative to surveys as a measure of consumer sentiment and to contribute to the literature new algorithms for the spatiotemporal reconciliation and analysis of heterogeneous, co-varying data.

2009 — **M.Sc. Computer Science**, *GPA: 3.9/4*, University of Illinois at Chicago, USA

Thesis: Exploratory Data Analysis of Digital Communications in Global Cities. Supervised by Prof. Jason Leigh, the thesis contributes to the study of global cities, their evolution, and their impact on global affairs. The thesis studies cities as organizational hubs of information flows through the visualization of data gathered by pervasive systems like telecommunication networks. It also presents a methodology to analyse the data to study the presence and movements of crowds in the city, like during the NYC Waterfalls public exhibition of Summer 2008.

2008 — **M.Sc. Computer Engineering**, *Summa Cum Laude*, Politecnico di Milano, Italy

Thesis: Persistence, Security, and Web-based Management for WikiCity, an Urban Information System. Supervised by Prof. Carlo Ghezzi, the thesis provides a thorough overview of the field of urban informatics, which studies the interaction of people, places, and technologies, and presents WikiCity, an information system for the real-time mapping of city dynamics, discussing the system architecture and the implementation of a data persistence layer, a security model for authentication and authorization, and a web application for administration.

2005 — **B.Sc. Computer Engineering**, *Summa Cum Laude*, Politecnico di Milano, Italy

Thesis: Analysis of Predictive Models for the Financial Markets. Supervised by Prof. Sergio Bittanti, the thesis proposes a comparative analysis of the performances of different autoregressive and moving average models (ARX and ARMAX) in predicting the percentage return of the S&P 500 index on a daily basis. The work also takes into consideration other techniques, in particular neural networks and fuzzy control systems.

2008 — **Alta Scuola Politecnica**

Alta Scuola Politecnica is a joint institution of Politecnico di Milano and Politecnico di Torino. The school runs in parallel to the graduate programmes and offers advanced studies in innovation and leadership paired with multidisciplinary projects in collaboration with Italian companies and public institutions.

2008 — **Collegio di Milano**

Collegio di Milano is an Italian college of excellence where the best students from the seven universities in Milan work on multidisciplinary projects and follow a program of extra curricular activities which include ex-cathedra courses, discussion forums, and music and photography laboratories.

Industrial and Academic Experiences

Summer 2010 — **Software Engineer**, *Google Inc.*, New York, USA

The internship in the geoengineering team focused on refactoring and updating internal tools that are used to analyze and visualize Google's geographical data sets and to identify clustering and consistency problems in the data before it is made accessible in Google Maps.

Spring 2010 — **Temporary Professor**, *New Academy of Fine Arts*, Milan, Italy

Held a lecture series on Information Design. The workshop covered the theoretical aspects of the information design workflow (from raw data to visual analytics) and the practical aspects of analyzing and presenting information with R and Processing.

Summer 2009 — **Visiting Scientist**, *Santa Fe Institute*, Santa Fe, USA

Developed visual analytics for very large spatial dynamic networks, like cell phone networks and transportation networks. The system was used to study the urbanization processes and the diffusion of diseases in rural areas of Africa. It is also used to support the ongoing research on the assessment of consumer sentiment.

2007–2009 — **Research Associate**, *Massachusetts Institute of Technology*, Cambridge, USA

Developed an information system for the study of mobility, tourism, and social dynamics in the urban environment. The system was used to study the distribution and evolution of social activities in Italy, Spain, New York City, and Washington, D.C. during events like the NYC Waterfalls and the Presidential Inauguration.

Spring 2007 — **Teaching Assistant**, *University of Illinois at Chicago*, Chicago, USA

Tutored students, prepared and graded homework for CS 202 Data Structure and Discrete Mathematics 2.

2004–2005 — **Software Developer**, *IFA Consulting*, Verona, Italy

Developed a web-based application for the management of customers and financial portfolios. Responsibilities included the design of the software architecture and database system, and weekly consulting sessions with company associates and clients.

Spring 2004–06 — **Graduate Assistant**, *Politecnico di Milano*, Milano, Italy

Supervised the computer laboratory of Industrial Engineering. Managed the departmental database system.

Projects and Collaborations

opinion mining — **Study of User-Generated Evaluative Texts**, Ongoing
The project aims at developing a ranking algorithm for user-generated evaluative texts like blog comments and product reviews based on the properties of authority, authenticity, honesty, and helpfulness. Based on our studies, these are very different in nature and could be used to uniquely and completely rank the relevancy of such content.

information visualization — **Obama | One People**, February 2009–March 2009, *senseable.mit.edu/obama*
Obama | One people is an unprecedented analysis of Barack Obama's Inauguration Day on January 20, 2009. The project features two visualizations of mobile phones call activity that characterize the inaugural crowd and answer the questions: Who was in Washington, D.C. for President Obama's Inauguration Day? When did they arrive, where did they go, and how long did they stay?

information visualization — **The World's Eyes**, November 2008–December 2008, *senseable.mit.edu/worldseyes*
The World's Eyes illustrates the photos that people visiting Spain leave behind them as evidences of contemporary tourism in the country, uncovering the evolutions of the presence and flows of tourists. The analysis and mapping of this data allows to understand the attractiveness of leisure cities and their points of interest.

urban studies — **NYC Waterfalls**, August 2008–December 2008,
In occasion of the NYC Waterfalls, a $20 million public exhibition in New York aimed at attracting people towards the waterfront of the city, we demonstrate how digital footprints has significant promise for conducting tourism studies and the optimization of tourism strategies, plans and marketing tools. Our results contribute new insights to quantify the distribution of visitors and assess the attractiveness of areas of interest in proximity of the event.

architecture — **Digital Water Pavillion**, May 2008–June 2008, *digitalwaterpavilion.com*
Supervised by Prof. Carlo Ratti (MIT) and Prof. William Mitchell (MIT), the DWP is an interactive structure made of digitally controlled water curtains located at the entrance to Expo Zaragoza 2008. The project is the first example of reconfigurable architecture that allows spaces to expand or shrink based on necessity and use. The DWP was selected as Time magazine's best invention of 2007.

information visualization — **New York Talk Exchange**, December 2007–February 2008, *senseable.mit.edu/nyte*
Supervised by Prof. Carlo Ratti (MIT), NYTE illustrates the global exchange of information in real-time by visualizing volumes of long distance telephone and Internet data flowing between New York and cities around the world. The project was developed in partnership with AT&T and was exhibited for four months at the Museum of Modern Art in New York for the Design and Elastic Mind exhibition.

urban studies — **WikiCity**, October 2007–Present, *senseable.mit.edu/wikicity*
Supervised by Prof. Carlo Ratti (MIT), WikiCity started by developing a dynamic model of a city interpreted as a real-time control system which can be optimized by enacting a feedback loop between people and places through technology. The project then evolved into a complete urban information system for the real-time mapping of city dynamics which becomes a decision support system for the citizens, the businesses, and the authorities.

affective computing — **WoMan: Window on Man**, January 2005–February 2008
Supervised by Prof. Andrea Bonarini (PoliMi), the project aims to assess the design of a bed system able to collect and analyze physiological signals, and react creating a more comfortable environment by controlling ambient lightning, sound effects, temperature, and so fore.

cognitive sciences — **Gruppo Mente**, January 2006–July 2006, *gruppomente.it*
Supervised by Prof. Viola Schiaffonati (PoliMi), the project aims to investigate a common interest among students of Philosophy, Engineering, Media Science, Biology, Psychology, and Law on the nature of the mind and the functioning of the brain.

Languages
Common European Framework of Reference for Languages

Italian — **Mother Tongue**

English — **Proficient** — *TOEFL: 270/300 (2006), Spoken Interaction: C2, Reading: C2, Writing: C2*

Social and Technical Skills

social skills — I am highly motivated and enjoy challenging works; I have strong team spirit and ability to work in multidisciplinary environments; I have optimal communication skills.

technical skills — Data Mining; Machine Learning; Information Visualization; Software Engineering; Database Management; Artificial Intelligence; Soft Computing; Web Development; Computer Security.

programming — Java, Python, Matlab, R, Processing, ActionScript   **database** — PostgreSQL, PostGIS, MySQL, SQL Server

os — Linux, Mac OS X, Windows   **other** — JavaScript, HTML, PHP, JSP, CSS, XML, LaTeX

Publications

November 2009	**Towards the SocioScope: an Information System for the Study of Social Dynamics through Digital Traces**, *Vaccari, A., Calabrese, F., Liu, B., Ratti, C.*, 17th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems
October 2009	**A holistic framework for the study of urban traces and the profiling of urban processes and dynamics**, *Vaccari, A., Liang, L., Biderman, A., Ratti, C., Pereira, F., Oliveirinha, J., Gerber, A.*, 12th International IEEE Conference on Intelligent Transportation Systems
September 2009	**MIT Enernet: Correlating WiFi Activity to Human Occupancy**, *Vaccari, A., Samouhos, S., Glicksman, L., Ratti, C.*, Healthy Buildings 2009 - 9th International Conference and Exhibition
August 2009	**Estimating the Presence of People from Aggregate Cell Phone Network Activity**, *Scognamiglio, F., Vaccari, A.*, 6th International Symposium on Digital Earth
August 2009	**Quantifying urban attractiveness from the distribution and density of digital footprints**, *Girardin, F., Vaccari, A., Gerber, A., Biderman, A., Ratti, C.*, International Journal of Spatial Data Infrastructures
June 2009	**Towards estimating the presence of visitors from the aggregate mobile phone network activity they generate**, *Girardin, F., Vaccari, A., Gerber, A., Biderman, A., Ratti, C.*, 11th International Conference on Computers in Urban Planning and Urban Management
August 2008	**Perceptual data hiding exploiting between-coefficient contrast masking**, *Marano, S., Battisti, F., Vaccari, A., Boato, G., Carli, M.*, 2008 Conference of the the International Society for Optical Engineering (SPIE)

Talks

June 2010	**The Digital Sociology** Frontiers of Interaction 2010, Rome, Italy
February 2010	**Information Design** New Academy of Fine Arts, Milan, Italy
June 2009	**The Real Time City** Frontiers of Interaction V, Rome, Italy
March 2009	**The Real Time City** O'Reilly ETech 2009, San Jose, CA
May 2008	**The New York Talk Exchange** O'Reilly Where 2.0 2008, Burlingame, CA
March 2008	**The New York Talk Exchange** O'Reilly ETech 2008, San Diego, CA

Press

November 2009	**Andrea, a job at MIT and a big entrepreneurial spirit (in Italian)** Corriere della Sera, Enzo Riboni, November 27, 2009
June 2009	**NYC Waterfalls: How Real-Time Cellphone Data Can Impact Local Economies** New York Times and ReadWriteWeb, Richard MacManus, June 8, 2009
June 2009	**The World's (Phone) Reactions to Obama's Inauguration** O'Reilly Radar, Brady Forrest, June 5, 2009
April 2009	**Building the SENSEable City** O'Reilly Radar, James Turner, April 16, 2009
April 2009	**Interview with Andrea Vaccari, research associate at MIT's SENSEable City Laboratory** ZDNet Emerging Tech, Chris Jablonski, April 9, 2009
March 2009	**World's Eyes: Mapping the Visual Traces of Tourism in Spain** Information Aesthetics, Andrew Vande Moere, March 9, 2009
September 2008	**WikiCity: Can a City Perform as a Real-Time Control System?** Focus 76 Ideas de Ciudad, September 2008, pp. 26-31
September 2008	**The city that never sleeps... nor stops talking** MIT News Office, Patti Richards, February 18, 2008
November 2007	**Digital Water Pavilion: Best Invention of 2007** Time Magazine, November 2007