

July 25th, 2008

Creating a new Master “Web Sciences”...

CRI –Paris Descartes / ORANGE/ Paris-Montagne/ La Cantine by Silicon Sentier

"Since its inception, the World Wide Web has changed the ways scientists communicate, collaborate, and educate. There is, however, a growing realization among many researchers that a clear research agenda aimed at understanding the current, evolving, and potential Web is needed. If we want to model the Web; if we want to understand the architectural principles that have provided for its growth; and if we want to be sure that it supports the basic social values of trustworthiness, privacy, and respect for social boundaries, then we must chart out a research agenda that targets the Web as a primary focus of attention.

When we discuss an agenda for a science of the Web, we use the term "science" in two ways. Physical and biological science analyzes the natural world, and tries to find microscopic laws that, extrapolated to the macroscopic realm, would generate the behavior observed. Computer science, by contrast, though partly analytic, is principally synthetic: It is concerned with the construction of new languages and algorithms in order to produce novel desired computer behaviors. Web science is a combination of these two features. The Web is an engineered space created through formally specified languages and protocols. However, because humans are the creators of Web pages and links between them, their interactions form emergent patterns in the Web at a macroscopic scale. These human interactions are, in turn, governed by social conventions and laws. Web science, therefore, must be inherently interdisciplinary; its goal is to both understand the growth of the Web and to create approaches that allow new powerful and more beneficial patterns to occur."

"Creating a Science of the Web" T. Berners-Lee et al SCIENCE VOL 313(11) 2006

Since the publication of this article, a Web Science Research Initiative (WSRI <http://webscience.org/>) has been launched (Sept 2006). A joint endeavor between the Computer Science and Artificial Intelligence Laboratory (CSAIL) at MIT and the School of Electronics and Computer Science (ECS) at the University of Southampton, this [Web Science Research Initiative](#) brings together academics, scientists, sociologists, entrepreneurs and decision makers from around the world, creating the first multidisciplinary research body to examine the World Wide Web and offer the practical solutions needed to help guide its future use and design.

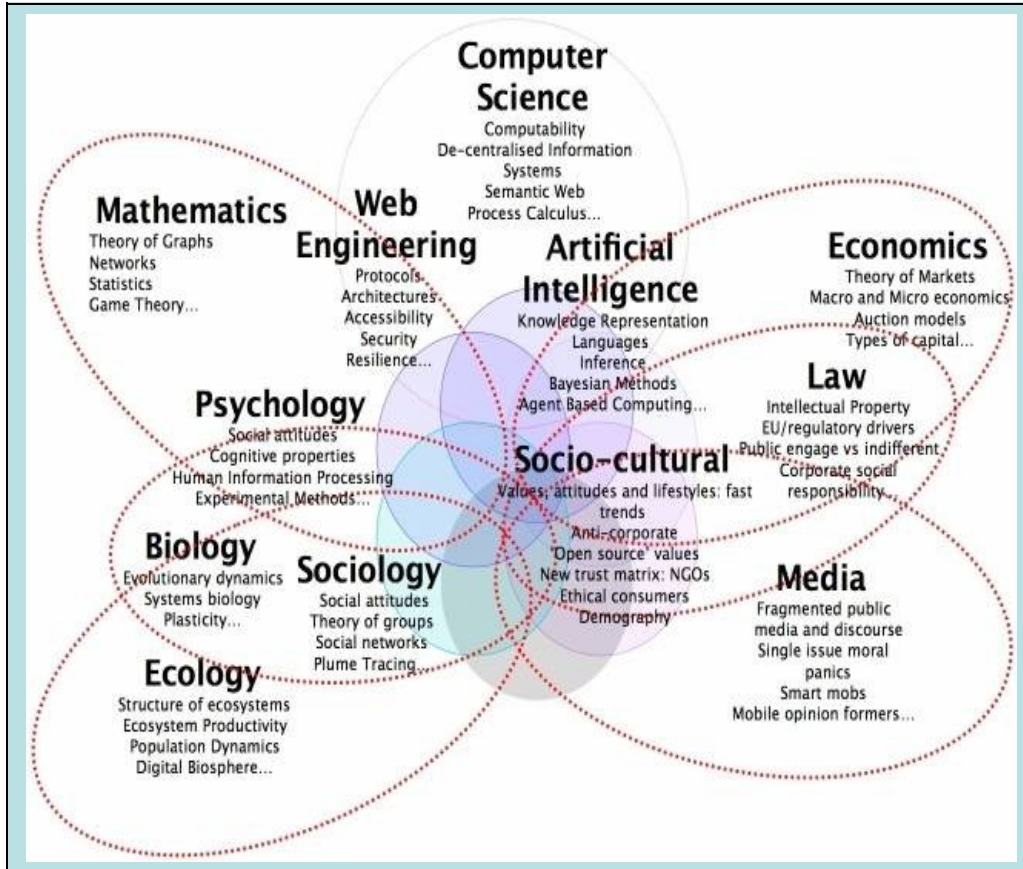
NB: British Telecom became a WSRI founding sponsor on July 7th, 2008

*WSRI has 4 founding directors: **Tim Berners-Lee**, director of the WWW Consortium, senior research scientist at MIT and professor at the University of Southampton; **Wendy Hall**, professor of computer science and head of the School of Electronics and Computer Science, University of Southampton; **Nigel Shadbolt**, professor of artificial intelligence at the University of Southampton and director of the Advanced Knowledge Technologies Interdisciplinary Research Collaboration; and **Daniel J. Weitzner**, Technology and Society Domain leader of the WWW Consortium and principal research scientist at MIT. **Jim Hendler**, Professor of computer science at Rensselaer Polytechnic Institute, serves as Associate Director.*

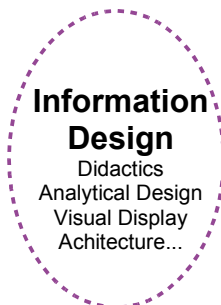
Following the WSRI rationale (that we fully endorse), we propose to launch a new **Master in Web Sciences**, that could be called “**Approches Interdisciplinaires du Web**”, taking advantage of the experience already gained through the 5 years of success of another multidisciplinary Master “Approches Interdisciplinaires du Vivant” (“AIV”,

launched in Sept 2004 at Paris Descartes/ENS). No similar academic cursus seems to exist anywhere in France to date...

“Web Sciences” Academic Coverage



To the above WSRI description of the “Web Sciences” overall field, we feel mandatory to add at least another “petal”, concerning “Information Design” (how to structure, represent, share, transmit information, know-how, experience in the Web world...).



see for ex” Knowledge transfer in a digital world: Field data acquisition, uncertainty, visualization, and data management” C.E. Bond et al *Geosphere*; 2007; 3(6) 568-576

Functioning

We believe a science of Web must emerge through the interactions of students and professors from various fields. Indeed, the Web is a new universe constantly evolving, and we feel that this field more than any other is favourable to intergenerational and pluridisciplinary thinking.

The **launching** of this new master's programme will last **two years**, « year zero » and « year one ». Year zero (2008/09 hopefully) will be a launching year that will not deliver any academic diploma. Year one (2009/2010) will be the first year delivering a diploma in « Web science ».

Year zero will be organized around weekly meetings and discussions. During these sessions, students will present their work and professors will be invited to give talks.

The year will be segmented in three trimesters during which students will carry on rotations in labs and write projects. *This setting has been realized in the « Interdisciplinary Approaches of Life » Master's programme, initiated by the CRI* Students' own projects will be realized in small groups. The first one will be a critical and methodological analysis of a Web site. The second will be a review on a chosen transversal subject. Some freedom will be given regarding the last one. It will be whether a comment of a book or the designing of a Web project, that will possibly be implemented later on.

During their internships, students will have to at least build a Web tool (Web site or any technical tool made easily available on the Internet) and carry out a research project associating different disciplines of Web sciences.

The year will start with a week during which all the students and professors will meet. This week will allow students to sketch projects and professors to guide them towards the paths of their own interests. Practically, brainstorming and research project writing will constitute the main part of this week.

Who are we?

We decided to set up this training programme in answer to a common need of numerous actors. After several meetings, the structure of the programme emerged from everyone's experience.

- **The CRI** <http://www.cri-paris.org/fr/cri/>

The « Centre de Recherche Interdisciplinaire » (Centre for Interdisciplinary Research), created in 2004, is a place to exchange at the crossing of natural, cognitive and social sciences. It links various activities as think tanks, the « Interdisciplinary Approaches of Life » Master's programme and interdisciplinary research.

- **Paris Montagne** <http://www.paris-montagne.org/>

This association aims at promoting the world of research and science to high school students. Each year, it offers scientific activities and internships in labs to highly motivated Ile de France (Paris region) students.

The young generation will certainly inspire the future directions of the Web; most of these young students grew up with Internet and are masters in surfing the Web. It is thus just impossible to work on Web science without being linked to this new generation.

- **La Cantine / Silicon Sentier** <http://lacantine.org/>

Hub of the digital parisian ecosystem, La Cantine is driven by the French start-up association Silicon Sentier. First co-working space in Paris, La Cantine crews and cheers facilitate the emergence of all innovative project in web and IT.

La Cantine by Silicon Sentier favors the conception and emergence of new uses, products and research by accelerating ideas, creation and networked innovation. This venue is fully designed for collaborative work and help cooperation flow.

Additionally, La Cantine opens up to French and international networks (co-working, art-oriented platforms, alternative venues, competitive clusters, specialized research labs, colleges and universities).

- **Orange**

Teaching contributors

Academics from various fields (Paris Universities, ParisTech, Engineer Schools)

Entrepreneurs (members from Silicon Sentier, from Orange Business Units etc)

Researchers from Orange R&D

Prospectivists (in particular, FING collaborators)

Designers

etc...

References

- “Creating a Science of the Web” T. Berners-Lee et al. SCIENCE VOL 313(11) 2006
- “Web Science” W. Hall ALT-N 12 May 2008 <http://eprints.ecs.soton.ac.uk/15682/>
- “Web Science: a Provocative Invitation to Computer Science” B. Shneiderman, Communications of the ACM, 50 (6), 25-27, 2007
- [Web Science: An interdisciplinary approach to understanding the World Wide Web](#) James Hendler, Nigel Shadbolt, Wendy Hall, Tim Berners-Lee, and Danny Weitzner Communications of the ACM (cover story), July 2008
- <http://webscience.org/>

Web Science: A Provocative Invitation to Computer Science

Here's how it can awaken computer science to the interdisciplinary possibilities of the Web's socially embedded computing technology.



Much more than a provocative term, “Web science” signals a new way of thinking about computer science. Computer science researchers and professionals are familiar with the turbulence of technology innovation; Web science promoters challenge them to expand the scope of computer science. Indeed, declining enrollment and industry shifts have shaken computer science, so Web science promises to be an invigorating direction.

Writing in *Science* magazine last August, Sir Tim Berners-Lee and collaborators called for a new discipline [3] and detailed their case in an online 130-page monograph [2]. These esteemed revolutionaries offered a visionary manifesto that says that after 40 years of focusing on computer science, it is time for computer scientists to shift to Web science [9].

Their starting definition of the new discipline is the “science of decentralized information systems”; they followed with a rich research agenda of emerging technologies, including the Semantic Web, ontologies, Web services, and Web-scale computing (see the table here). This proposed shift to Web science raises the importance of such traditional computer science topics as graph theoretic models, network structure analyses, and search algorithms that are likely to be familiar to computer scientists.

But Web science advocates make clear that understanding Google’s technology and business success requires more than a discussion of Web crawling and distributed search algorithms. They insist something bigger and bolder is becoming important and will take an open mind for the traditional computer science community to absorb.

SOCIALLY EMBEDDED

Although the research topics they describe have origins in computer science, “the Web as a technology,” they say, “is socially embedded.” The implications of this expanded view are profound, leading them to broaden their research agenda to address such social issues as trust, reputation, privacy, governance, copyright, and network communications standards. Since they recognize the essential social nature of Web technologies, they also embrace the idea that Web science must address user needs and requirements analysis through questions like: What do people and communities want from the Web?

The social perspective pushes Web science researchers toward a deep understanding of the information and services users want. The disruptive shift involves moving away from studying the technology toward studying what users can do with the technology [7]. While computer scientists have found Moore’s Law to be a helpful measure of progress, Web scientists are more interested in counting page views and unique vis-