Web science curriculum tracks : identifying disciplines & targeted expertise

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Web science curriculum basics

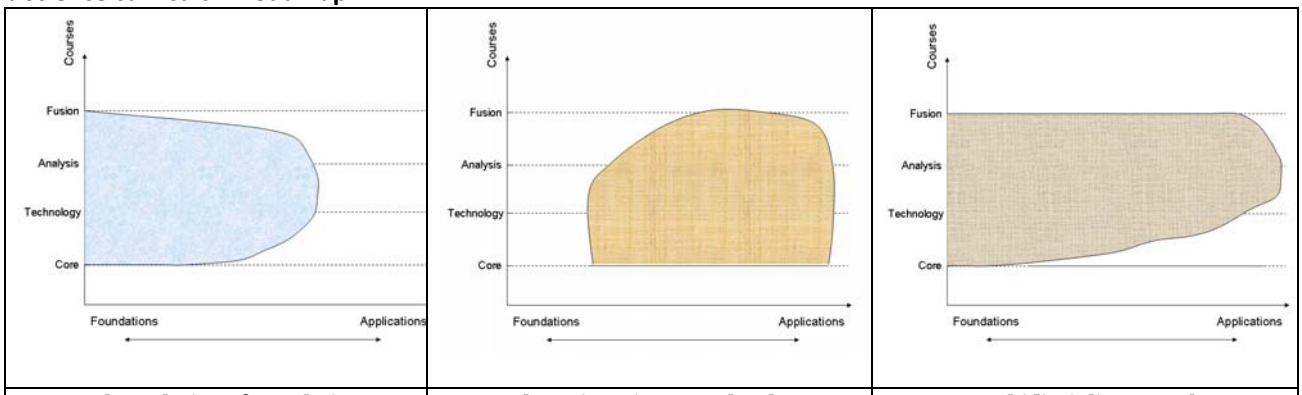
It is important to identify which Web science degrees we envision since currently such degrees are not universally offered and they have not matured. There are several tracks which we can identify in order to cover many kinds of Web science degree programs. More specifically, there is a need to design and offer both undergraduate and graduate curricula tracks addressing current Web theory but Web technologies and engineering as well. The distinct tracks should be tuned to universities and institutions scientific trends and at the same time they should be approved by academic, scientific and business organizations and societies at an international scale. The framework for web science described in [2] identifies the most crucial web science issues such as engineering, analysis, science and social aspects. Based on this framework and by exploiting the ideas summarized in the ACM/IEEE Computing curriculum report [1] we may highlight required disciplines for Web science.

Web science curriculum disciplines

Based on current trends it seems that the following three popular major disciplines :

- *Web analysis & formulation* which will focus on understanding and analyzing Web scene and it will involve topics originating from mathematics, mining, data management algorithms, Web databases, searching and indexing and graph theory. Such a curriculum should involve Web oriented theories, methodologies, and application scenarios;
- *Web engineering & technology* which will focus on the engineering part of the Web such as design, networking, communications, software (services, robots, applications) and their interrelationships. Such a curriculum should involve Web engineering centered theories, principles, and practices;
- *multidisciplinary Web* which will focus on the many disciplines intersecting Web science such as social networks, human behavior and psychology, security and governance. Such a curriculum should involve topics from such disciplines which have (or expected to have) influence on the emergence of the Web.

Web science curriculum roadmap



Web analysis & formulation	*Web engineering & technology*	*Multidisciplinary Web*

In a similar to [1] manner we can identify the main topics/courses which should characterize each of the above disciplines and a suggested categorization is to include :

- Core courses : Math, Natural sciences (physics,biology), theory of algorithms, graph theory, etc
- Technology courses : networks, web technologies, web databases etc
- Analysis courses : Web mining, machine learning, social networks, etc
- Fusion courses : integrating human behavior with web analysis, social web and technologies, biological and web patterns etc

As depicted in Figure 1 then the proposed disciplines could offer different ratios of these courses in order to cover targeted audiences whom expertise may vary from Web theoriticians to Web practinioners.

References

[1] Computing Curricula 2005 The Overview Report by the Joint Task Force for Computing Curricula 2005, ACM & IEEE, http://www.acm.org/education/curric_vols/CC2005-March06Final.pdf.

[2] Tim Berners-Lee, Wendy Hall, James A. Hendler, Kieron O'Hara, Nigel Shadbolt, Daniel J. Weitzner : A framework for web science, Source Foundations and Trends in Web Science, Volume 1 , Issue 1, Pages: 1 – 130, January 2006.