

University of Technology of Compiègne, France
UMR CNRS 7338 Biomechanics and Bioengineering (<http://www.utc.fr/bmbi/>)
Starting Date: between 01 March 2013 and 31 March 2013
Job Time: 6 months

Title: Development of a new semantic-enhanced PageRank algorithm.

We are searching a potential applicant to work on the development of a new semantic PageRank algorithm dedicated to the Web-based Human Musculoskeletal System Resources (HMSR) in the field of Biomechanics. A first version of such an algorithm was developed in our previous studies [1, 2].

Job Objectives:

The successful candidate will work on

- 1) The development of a new version of an available semantic PageRank algorithm through a new enhanced mathematical model. This task includes also the implementation of a web crawler and a content-based database using our available ontology OSMMI [3] and an available dedicated database server.
- 2) The systematic performance evaluation between the new PageRank algorithm, the first version [1, 2], others literature-based algorithms and a conventional PageRank algorithm (e.g. Google-based PageRank).

Provisory planning:

- Step 1: Perform the state-of-the-art of the PageRank algorithms and semantic PageRank algorithms: mathematical/conceptual model, systematic performance evaluation, domain application (2 weeks).
- Step 2: Propose a new semantic-enhanced PageRank algorithm based on available mathematical framework of our first version (4 weeks).
- Step 3: Implement the proposed semantic-enhanced PageRank. This step includes also the creation of a web crawler and a content-based database. Note that a database server will be dedicated to this implementation (8 weeks).
- Step 4: Perform the systematic performance evaluation (6 weeks).
- Step 5: Write the thesis and prepare the presentation (4 weeks).

Required qualification: Master's internship in Computer Sciences (Software Engineering, Knowledge Engineering, Artificial Intelligence, Databases, Human-Computer Interaction, etc.)

Required skills:

- Advanced knowledge/experience in information retrieval/search engine and/or semantic-based information processing.
- Advanced programming expertise in Java.
- Experience in database development and implementation (MySQL).
- Strong interpersonal and organizational skills.

Salary: 420€ per month.

Application: Send your detailed CV, a letter of interest, and contact information of two references to: Dr. Tien Tuan DAO (tien-tuan.dao@utc.fr). The closing date for the application is no later than 15 February 2013.

References:

- [1] TT Dao, TN Hoang, XH Ta, MC Ho Ba Tho. 2012. Knowledge-based Personalized Search Engine for the Web-based Human Musculoskeletal System Resources (HMSR) in Biomechanics. Journal of Biomedical Informatics; <http://dx.doi.org/10.1016/j.jbi.2012.11.001>
- [2] TN Hoang 2011. Biomechanics Computer-Aided Decision System: Ontology and Semantic Web Services. Master thesis, UTC, pp. 1-54.
- [3] TT Dao, F Marin, MC Ho Ba Tho. Ontology of the musculo-skeletal system of the lower limbs. Conf Proc IEEE Eng Med Biol Soc. 2007; pp. 386-9.