



*Call for Papers for a*  
Special Issue of the Information Sciences Journal on  
**Collective Intelligence**

**BACKGROUND:**

Since the first formal specifications of modern computing machinery as laid out by Alan Turing and his contemporary fellows, we have been witnessing, during the last three decades, an evolutionary path in computing towards more personalized and contextualized data and knowledge artefacts. Information sharing, coordination, cooperation and, to some extent, collaboration among machines has been envisioned for complex problem solving. A prominent example of this problem solving approach has been the Fifth Generation Computer Systems (FGCS) project as launched in Japan in the 80's and based on the concept of calculation using massive parallelism in logic and hardware. Grid and Distributed Computing, also known as Future Generation Computer Systems (FGCS), is another similar attempt to exploit massive parallelism in order to solve complex problems.

The optimal usage of distributed computing, data and knowledge resources has always been the means in order to tackle hard problems in Science, Engineering and Medicine. The SETI (Search for Extra-Terrestrial Intelligence, Berkeley, USA) project is one prominent example in this category followed by the Human Genome project. It is no surprise that projects like e-Science, as recently launched by the UK government, and the GRID computing are meant to create a computing paradigm, where "computer is the network". In all these approaches, however, the problem seems to be well defined and no synergies across participants from different cultural and professional backgrounds are requested in order to create a solution, particularly for messy problems where the synergy of a group of people is required.

In the early 21<sup>st</sup> century with the rise of the Social and Semantic Web, however, the answer of "what is a network" has been relaxed by the inclusion of users and user communities, which form social networks via computerized means. Ecosystems of participation of humans and machines have been created where the involvement of human beings as creators and consumers in problem solving and learning tasks as well as of data and knowledge has been of paramount importance. Clusters of computers have been enhanced by clusters of humans as well as clusters of humans and machines. Formation of social groups

follows the same principles of social behaviour, common interests, e.g., studies, hobbies, games. *Wikipedia* has been a success story of a collaborative environment for knowledge creation and sharing. *Facebook*, *MySpace*, *Del.icio.us*, *Flickr* have been further success stories of social networking with digital media.

This special issue explores the notion of this human-machine model of Collective Intelligence (CI) and its potential to become a new computing paradigm for creating solutions or strategies to tackle messy problems. These are problems where the synergistic interactions of a group of people with diverse cultural and professional backgrounds are requested, e.g., the situation after the Hurricane Katrina, 2005, in the U.S. It explores the move from personalized contents and information access, i.e., *collected* knowledge systems and intelligence, to collective knowledge systems and intelligence. It also explores the challenge of boosting the collective IQ of organizations and society where both human and machine contribute actively to the resulting intelligence with each doing best what they do best.

#### GUEST EDITORS:

*Dr. Epaminondas Kapetanios*, University of Westminster, London, UK

*Dr. Georgia Koutrika*, Stanford University, USA

#### CONTRIBUTIONS SOUGHT:

This is by no means an exhaustive list of challenges and questions to be addressed by the submitted papers in order to come closer to a methodology of how to apply CI to the solution of problems:

- (How) do we plug-in personal data and knowledge into a problem solving social network?
- (How) do we guarantee communication at different levels of expertise and cultural and multi-lingual backgrounds?
- (How) do we guarantee communication between experts and end users in their role as members of a particular society and participants in problem-solving strategies and techniques?
- (How) do we harness the inherent complexity of networked solutions?
- (How) can we create cooperating systems in a cost-effective way?
- (How) can we integrate systems in a meaningful way without sacrificing autonomy?
- (How) can we bring together diverse conceptions and interpretations of user communities?
- (How) do we cope with uncertainty and probability in data management and knowledge discovery?
- (How) do we create systems to enable collaboration?
- (How) do we ensure that quality in knowledge and software creation and consumption is assured?
- (How) can we ensure security and trustworthiness in networked environments?
- (How) do we enable learning via computer games and multimedia enhanced knowledge sources?

- (How) do we make sure which inference and reasoning techniques are applied to available data? Does reasoning and available data match?

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A non-exhaustive list of application paradigms is the following:

- *Collaborative Scientific Problem Solving*
- *Maintaining Model Bases*
- *Environmental Monitoring and Global Climate Change*
- *Collaborative Business Models and the Enterprise 2.0*
- *Collaborative e-Learning*
- *Social Networking Analysis*
- *e-Governance*
- *Collective Transportation Systems*
- *Collective Environment Monitoring Systems*
- *etc.*

#### IMPORTANT DATES:

- Submission of Abstracts (optional): August 15, 2008
- Initial Submission: October 1, 2008
- First Round Reviews: January 15, 2009
- Resubmission by: March 15, 2009
- Final Acceptance: May 15, 2009
- Publication: Second half 2009, with pre-publication via [www.sciencedirect.com](http://www.sciencedirect.com)

#### SUBMISSION GUIDELINES:

Optional abstracts to gauge the appropriateness of a research idea for further development for the special issue are welcome, and should be submitted to the Guest Editors via [E.Kapetanios@westminster.ac.uk](mailto:E.Kapetanios@westminster.ac.uk) and [koutrika@stanford.edu](mailto:koutrika@stanford.edu). Manuscripts should be submitted online at <http://ees.elsevier.com/ins/> by the date of initial submission, double spaced in 11 or 12-point fonts, with no more than 45 pages, inclusive of all references, figures and tables. Submitted manuscripts will be reviewed according to the peer review policy of the Information Sciences Journal as available on-line at [www.elsevier.com/locate/ins](http://www.elsevier.com/locate/ins). As papers are uploaded, authors should make sure to select the correct special issue (select “**Special Issue: Collective Intelligence**” when reaching the Article Type step). Only original and unpublished papers will be considered.

The guest editor(s) are committed to a 12-14 weeks turnaround on the first round of reviews for the *Collective Intelligence* special issue. We will empanel a special issue editorial board for this purpose. Indications of willingness to participate from interested researchers are welcome. The guest editor(s) will respond with first-round review comments on all papers no later than January 15, 2009. All final decisions will be made no later than the second round of reviews by May 15, 2009, although some decisions will be made earlier, as appropriate.

The special issue will finally comprise 9 single line papers of 25 pages each.