UTA to design new models for networked group learning and online work settings for Web 3.0

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George Siemens, executive director of UTA's LINK Lab. Credit: UTA

New research at The University of Texas at Arlington will analyze massive scale data traces from online work and learning communities to create new designs for networked learning and next generation

knowledge building on the internet.

The internet is today characterized by the convergence of ubiquitous connectivity, networked computing, and more intelligence through machine learning and artificial intelligence. The data sets used include social networking sites, medical devices, telescopes and satellites to emails, streaming data, financial and commercial transactions.

"With the growing number of options available to learn and create knowledge together with peers from around the world, we need to better understand how and why people choose to engage in different types of courses and knowledge environments," said George Siemens, executive director of UTA's LINK Research Lab.

"We aim to enable individuals who seek to better themselves to find the mentoring necessary to facilitate their path of growth and productivity," Siemens said.

Siemens won a three year, $400,000 grant from the National Science Foundation as part of a project proposal organized by Carnegie Mellon University to study Big Data. The project, titled "From Mining Massive Datasets to Designing Support for Coordinating Explanatory Coherence, Consensus, and Action" will bring together world leaders in the areas of language technologies, human-computer interaction, computer supported cooperative work and computer supported collaborative learning and education.

The researchers will build and interpret models of group and community interactions in learning and work settings that link processes with outcomes in order to identify behavior profiles that form the foundation for support of on-boarding, participation, productivity and mentoring. The research will also apply the interpretation of models to the development of empirically grounded design principles that motivate the

design of online communities that are conducive to effectively integrated learning and work.

"A careful balance of participation between exploration, consensus building, and coordination is needed for these communities to be successful. We are developing supportive technologies that foster environments in which this balance can be achieved and maintained," said Carolyn Rose, lead investigator at Carnegie Mellon University.

Some broader implications for the research are that supportive environments sensitive to individual differences, particularly with respect to needed support, will create more conducive environments for underserved participants like low-income minority students to better themselves and find a productive role within a community.

Siemens said the resulting data and modeling technologies will provide resources for continued research into group processes in online communities. The data will also provide resources for future research in the broader area of social computing.

Pete Smith, UTA's Chief Analytics Officer, emphasized the importance of this project within the university's increasing focus on data-driven discovery in the Strategic Plan 2020: Bold Solutions|Global Impact.

"Text mining of very large, international data sets is one of the most exciting research areas of our time," Smith said. "Dr. Siemens and the staff of LINK lab at UTA are leading players in this emerging global area of big data research applied to some of the most pressing research questions of our day."

The NSF Big Data program seeks novel approaches in computer science, statistics, computational science, and mathematics, along with innovative applications in domain science that lead towards the further development

of the interdisciplinary field of data science. In all, the program invested up to $26.5 million in proposals submitted. Projects were funded in the range of $200,000 to a maximum of $500,000 per year in total funding for 3 to 4 years of support.

The National Science Foundation in 2012 outlined efforts to build on NSF's legacy in supporting fundamental science and underlying infrastructure enabling the big data revolution. NSF-funded research in these areas will develop new methods to derive knowledge from data, and to construct new infrastructure to manage, curate and serve data to communities.

Provided by University of Texas at Arlington