The Quest for Automated Serendipity

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Abstract

Science and engineering knowledge have experienced explosive growth in recent decades due to the fast pace of technological change fueled by revolutions in experimental and computational capability. This growth has made it difficult, if not impossible, for even large research groups or organizations to identify and leverage any but the most immediately accessible developments. Many of the most significant advances in science and technology have been the result of serendipity catalyzed by an insight juxtaposing two ideas or concepts in a novel or unexpected way. In this talk, we introduce a proposed paradigm we shall call Automated Serendipity, which is envisioned to be a high performance information processing system that aids strategic correlation, analysis, and human understanding of available scientific, technical, and engineering knowledge for the purpose of systematically uncovering timely opportunities for technological innovation. Of particular interest is the ability to identify opportunities arising from synergistic developments in disparate disciplines or domains that can be derived from the technical literature. The purpose of this talk is to pose this problem to the community because of both its potential for high impact and to incite interest in meeting the significant mathematical challenges, as part of a concerted, integrated, multidisciplinary research agenda.