ANALYTICAL INNOVATIONS TO ACCELERATE SURVEILLANCE AND LARGE-SCALE STUDY RESULTS

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ABSTRACT

One of the key elements of an effective surveillance system is to provide timely feedback to relevant agencies or organizations. Surveillance of infectious and chronic disease information depends on obtaining and analyzing health or risk factor data from large samples of individuals. However, the analysis of data from large studies often takes so long that results lose their importance by the time they are obtained. Much of the processing time is spent accumulating raw data from various study sites, checking for outliers and statistical assumptions, conducting descriptive statistics, developing rules for imputing missing data, and finally conducting multivariable analyses. Even when data are obtained in real time, traditional analytic methods do not keep up because they are designed for batch operation. This seminar describes a new system that speeds the analysis process, because it is designed to update key study results as quickly as data arrive. This system continuously and automatically updates analysis statistics such as means, variances, correlation coefficients, regression weights, odds ratios, and relative risks in real time. In order to achieve this level of automation, the system detects and replaces missing or deviant data in real time as well. The system also handles multivariate and multifaceted results from large scale studies. Using this innovative method can improve response time for critical indicators and provide agencies with necessary results for immediate public health action.

Bob Jannarone is President of Brainlike Surveillance Research, Inc., a San Diego company that focuses on evaluating and delivering monitoring value for defense and security applications. In 1997 Bob founded Netuitive Inc., a venture funded company that delivers auto-adaptive, application performance monitoring products. Bob has authored several patents and a book that describe concurrent learning and information processing. He is a former (engineering, statistics, and psychology) professor, (ONR- and DOE-funded) researcher, and submarine nuclear engineer. Bob has degrees in computing, statistics, and psychometrics, including a Ph.D. from the University of California at Berkeley.