Better and more accessible data and rapidly growing computer power have helped make computer models more precise, as reflected by the incredibly accurate predictions of the development of Hurricane Sandy and the outcome of the U.S. presidential election. Computer model predictions founded on historical evidence are "one of the more positive trends we're going to see this century," says Tom Mitchell with Carnegie Mellon University's Machine Learning Department. The predictive power of computer models resides in three elements--computer power, mathematical formulas designed to mirror real world cause-and-effects, and present conditions rendered as numbers that can be used in formulas. Current condition data is entered by experts into formulas that anticipate a specific outcome if specific factors are combined, and then the systems repeatedly run those what-if simulations, with slight variations changing the final outcomes. An entire range of results is produced by running these scenarios tens of thousands of times. The end product is a breakdown of future events into probabilities. Statistician Nate Silver says his correct prediction of how all 50 states would vote for president is a triumph for computer modeling's use in the field of politics.
Full article:

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