

## **Medicine 2.0:**

### **Using Machine Learning to Transform Medical Practice and Discovery**

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This talk will present my view of the transformation of medicine through the use of machine learning and some of my own contributions. This transformation is already being felt in every aspect of medicine: from clinical support for personalized diagnosis and prognosis to the estimation of individualized treatment effects without the need for clinical trials to medical discovery to the entire path of patient care. The heart of this transformation is the intelligent use of data.

Machine learning cannot do medicine, but I envision a future in which machine learning will provide clinicians with actionable information: personalized risk scores, personalized treatment effects, personalized diagnostic and prognostic assistance, and recommendations.

In this talk, I will describe some of my work toward the realization of this future: developing novel machine learning methods and applying them in a wide variety of medical settings, including early warning systems for admission to intensive care, mortality and survival prediction and individual treatment effects for heart transplantation, and screening policies and practice for cancer. This work achieves enormous improvements over current clinical practice *and* over existing machine learning methods – but there is much more to be done. In this endeavour, I look forward to continuing and expanding my collaboration with clinicians and medical researchers.