Discussion of Sinica paper by M. Fygenson

Peter McCullagh

Department of Statistics
University of Chicago

Taipei, June 26 2007

General remarks

Extrapolation after observing data $(\mathbf{x}, \mathbf{y})$
Applications:
  low dose extrapolation $E(Y^*)$ at x^*
  rare cataclysmic events Y^* at x^*

Stochastic model p:
  prediction uses $p(y^* \mid \text{data}, x^*)$

Statistical model $\{p_\theta\}$ together with $\pi(\theta)$:
  use mixture $p = \int p_\theta \, d\pi(\theta)$ to compute $p(y^* \mid \text{data}, x^*)$

Statistical model $\{p_\theta\}$ without π
    use $p_{\hat\theta}(y^* \mid \text{data}, x^*)$ with suitable modification

Classical binary regression model
Structural components

- Independence of components $Y_1, Y_2, \ldots$
- Monotonicity of $F(x) = \mathrm{pr}(Y = 1; x)$
- Limits of zero and one as $x \to \pm\infty$

Fygenson's emphasis is exclusively on F

Lavine's (1991) model has first two components

In principle, all three structural components are important

Classical binary regression model
Structural components

- Independence of components $Y_1, Y_2, \ldots$
- Monotonicity of $F(x) = \mathrm{pr}(Y = 1; x)$
- Limits of zero and one as $x \to \pm\infty$

Fygenson's emphasis is exclusively on F

Lavine's (1991) model has first two components

In principle, all three structural components are important

Classical binary regression model
Structural components

- Independence of components $Y_1, Y_2, \ldots$
- Monotonicity of $F(x) = \mathrm{pr}(Y = 1; x)$
- Limits of zero and one as $x \to \pm\infty$

Fygenson's emphasis is exclusively on F

Lavine's (1991) model has first two components

In principle, all three structural components are important