

# Stochastic Newton with Arbitrary Sampling

Igor Melnikov

MIPT

# Empirical Risk Minimization problem

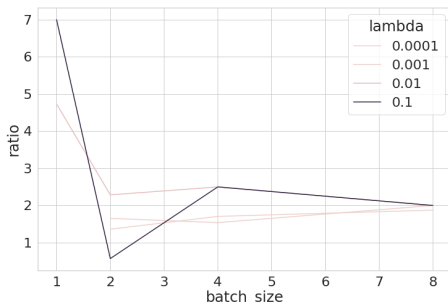


Figure 1: Convergence of NS algorithms

$$f_i(x) = \log(1 + \exp(-b_i a_i^\top x)) + \frac{\lambda}{2} \|x\|^2$$

Conventional sampling:  $p(i) = \frac{1}{n}$

Important sampling:  $p(i) = \frac{L_i}{\sum_{j=1}^n L_j}$

Convergence rate increased in 1.70 times