

$$f:X\rightarrow (-\infty,\infty]CX X$$

$$\scriptstyle k$$

$$x^k$$

$$g_k$$

$$_{x^k}^{x^C}$$

$$G_k(x)x \in X$$

$$g_kCG_k(x)x \in C$$

$$y\in R^IPIJKL(Px,y)KL(y,Px)x\in R^J_k$$

$$\boldsymbol{x}^k$$

$$Px{\textstyle\sum\nolimits_{i=1}^I}P_{ij}=1j$$

$$k = 1,2,\ldots$$

$$D_{f_2}(x,y)f_2$$

$$\frac{1}{2}\|x-x^k\|_2^2+\frac{1}{2}\|x^k-\hat{x}\|_2^2=\frac{1}{2}\|x-\hat{x}\|_2^2+\frac{1}{2}\|\hat{x}-x^k\|_2^2$$

$$\dot{g}_k(x)\geq 0 h(x)h(x)$$

$$xy$$

$$\frac{\nabla f_2 L 0}{x^k G_k(x) x} < \gamma \leq 1/L$$

$$x^kG_k(x)$$

$$\frac{\|x^k\|^2}{2\gamma}\|x-x^k\|_2^2+\frac{1}{2\gamma}\|x^k-\hat{x}\|_2^2=\frac{1}{2\gamma}\|x-\hat{x}\|_2^2+\frac{1}{2\gamma}\|\hat{x}-x^k\|_2^2$$

$$G_k(x)-G_k(x^k)=\tfrac{1}{2\gamma}\|x-x^k\|_2^2+\tfrac{\{x^k\}f(x)}{\{x^k\}f(x^k)}$$

$$\frac{\|x^k\|^2}{2\gamma}\|x-x^k\|_2^2+\frac{1}{2\gamma}\|x^k-\hat{x}\|_2^2=\frac{1}{2\gamma}\|x-\hat{x}\|_2^2+\frac{1}{2\gamma}\|\hat{x}-x^k\|_2^2$$

$$\frac{\{G_k(\hat{x})-G_k(x^k)\}\{g_k(x^k)\}\{f(x^k)-f(\hat{x})\}}{\{G_k(\hat{x})-G_k(x^k)\}\{g_k(x^k)\}\{f(x^k)-f(\hat{x})\}}$$

$$\frac{\{G_k(\hat{x})-G_k(x^k)\}\{g_k(x^k)\}\{f(x^k)-f(\hat{x})\}}{\{G_k(\hat{x})-G_k(x^k)\}\{g_k(x^k)\}\{f(x^k)-f(\hat{x})\}}$$

$$\frac{\{x^k\}\{x^{k_n}\}x^{**}\{x^{k_n-1}\}x^*f(x^*)}{\{x^k\}\{x^{k_n}\}x^{**}\{x^{k_n-1}\}x^*f(x^*)}=f(x^{**})=f(\hat{x})\hat{x}x^{**}\{G_k(x^{**})-G_k(x^k)\}\{\|x^*-x^k\|_2^2\}\{x^k\}x^*$$

$$\frac{\{x^k\}\{x^{k_n}\}x^{**}\{x^{k_n-1}\}x^*f(x^*)}{\{x^k\}\{x^{k_n}\}x^{**}\{x^{k_n-1}\}x^*f(x^*)C}=f(x^{**})=f(\hat{x})\hat{x}x^{**}\{G_k(x^{**})-G_k(x^k)\}\{\|x^*-x^k\|_2^2\}\{x^k\}x^*$$