

$$\hat{f}_{k+1}(\mathbf{x}_{k+1}) - \hat{f}_{k+1}^* \leq \sum_{k=0}^2 \left(1 - \alpha \mu_f^*\right)^k \hat{f}_k^* \quad + \frac{\alpha}{c} \hat{f}_k^* + \textcolor{blue}{\eta}^* + \eta_0,$$