

$$f_{k+1}(x_{k+1}) - f_{k+1}^* \leq (1 - \alpha\mu_f)^k (f_0(x_0) - f_0^*) + \frac{\alpha}{2} \sum_{t=0}^k (1 - \alpha\mu_f)^{k-t} \|\varepsilon_t\|^2 + (\eta^* + \eta_0) \frac{1 - (1 - \alpha\mu_f)^k}{\mu_f \alpha}.$$