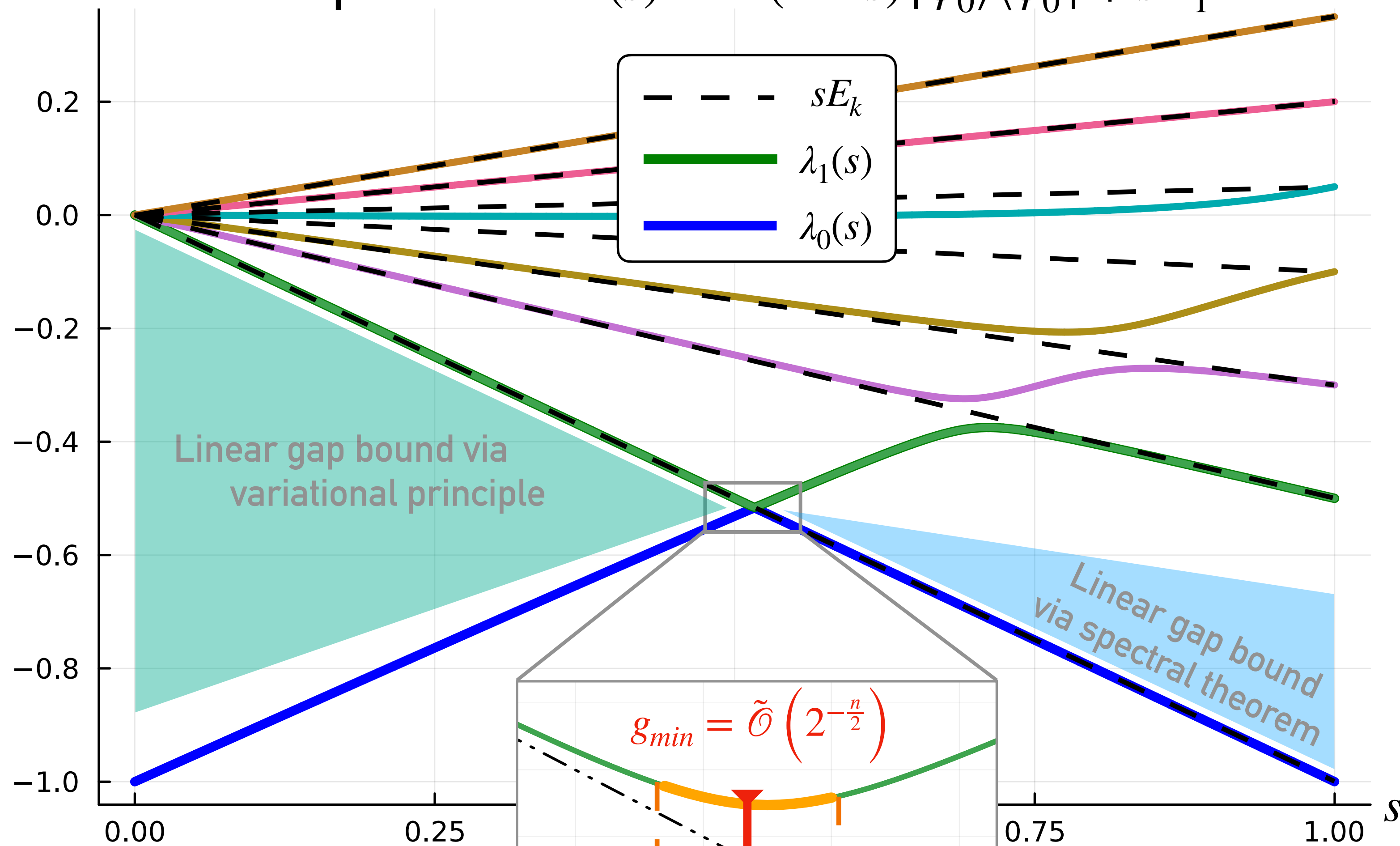


Spectrum of $H(s) = - (1 - s) |\psi_0\rangle\langle\psi_0| + sH_1$



Optimality via an adaptative schedule that follows the shape of the gap : $s' \propto g^p(s)$
 $\Rightarrow T = \tilde{\mathcal{O}}\left(\sqrt{2^n}\right)$

Perturbative theory around s^* , position of the avoided crossing

Limitation via hardness of estimating the position s^* to desired accuracy $2^{-\frac{n}{2}}$:

- **NP-Hard** within $\mathcal{O}(1/n)$ window
- **#P-Hard** exactly