Lec 4/2

Monday, April 2, 2018 12:43

$A_0 \subseteq A_1 \subseteq A_2 \subseteq \cdots$

$B_0 \subseteq B_1 \subseteq B_2 \subseteq \cdots$

and $A = \bigcup_s A_s$, $B = \bigcup_s A_s$

R_{2e+1}: $\chi_A \neq \Phi_e^B$

R_{2e+2}: $\chi_B \neq \Phi_e^A$

Stage 0: $A_0 \leftarrow \phi$

$B_0 \leftarrow \phi$

$\begin{bmatrix} x_j^0 \leftarrow j \\ r_j^0 \leftarrow -1 \end{bmatrix} \; \forall j \geq 1$ (we don't actually have to do anything here).

$\forall s \geq 0$, Stage $s+1$

choose the least $j \leq s$ s.t. R_j needs attention, i.e.

$\Phi_{e,s}^{B_s}(x_j^s)\downarrow = 0$ and $r_j^s = -1$, Assuming $j = 2e+1$. The case in which j is even is analogous, we simply switch the roles of A & B.

We do the following:

(1) $A_{s+1} \leftarrow A_s \cup \{x_j^s\}$

(2) $x_j^{s+1} \leftarrow x_j^s$

(3) $r_j^{s+1} \leftarrow 1 +$ the rightmost position of oracle head during $\Phi_e^{B_s}(x_j^s)$.

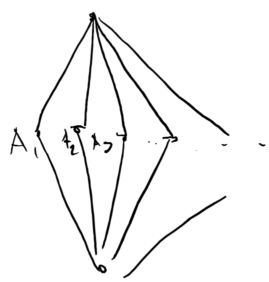
(4) $\forall n < j$ do $\begin{bmatrix} x_n^{s+1} \leftarrow x_n^s \\ r_n^{s+1} \leftarrow r_n^s \end{bmatrix}$

(5) $\forall n$ s.t. $j < n \leq s$ do

$\begin{bmatrix} x_n^{s+1} \leftarrow \min\{y : y > \text{each witness and each } r\text{-value assigned so far}\} \\ r_n^{s+1} \leftarrow -1 \end{bmatrix}$

generalize the F-M construction to obtain R.e sets $A_1, A_2, \ldots$

that are pairwise incomparable.



Requirements in a dovetailing manner.

Downey - Hirschfeldt (free online pdf)