

union-decodes-exists^{11,40}

$$\begin{aligned} & \forall es:ES, C, T:\text{Type}, R_1, R_2:(C \rightarrow E \rightarrow \mathbb{P}), \text{decodes}_1:(i:C \rightarrow e:\{x:E \mid R_1(i,x)\} \rightarrow \text{state@loc}(e) \rightarrow T), \\ & \quad \text{decodes}_2:(i:C \rightarrow e:\{x:E \mid R_2(i,x)\} \rightarrow \text{state@loc}(e) \rightarrow T). \\ & (\forall i:C, e:E. \text{Dec}(R_1(i,e))) \\ & \Rightarrow (\forall i:C, e:E. \text{Dec}(R_2(i,e))) \\ & \Rightarrow (\forall i:C, e:E. \neg(R_1(i,e) \ \& \ R_2(i,e))) \\ & \Rightarrow (\exists \text{decodes}:i:C \rightarrow e:\{x:E \mid (R_1(i,x) \vee (R_2(i,x)))\} \rightarrow \text{state@loc}(e) \rightarrow T \\ & \quad (\forall i:C, e:\{x:E \mid (R_1(i,x) \vee (R_2(i,x)))\}, st:\text{state@loc}(e). \\ & \quad ((R_1(i,e)) \Rightarrow (\text{decodes}(i,e,st) = \text{decodes}_1(i,e,st))) \\ & \quad \& ((R_2(i,e)) \Rightarrow (\text{decodes}(i,e,st) = \text{decodes}_2(i,e,st)))))) \end{aligned}$$