

Definition (Monoidal product in DP)

Given two design problems $\mathbf{d} : \mathbf{P} \rightarrow \mathbf{Q}$ and $\mathbf{e} : \mathbf{R} \rightarrow \mathbf{S}$, their *monoidal product* $\mathbf{d} \otimes \mathbf{e} : \mathbf{P} \times \mathbf{R} \rightarrow \mathbf{Q} \times \mathbf{S}$ is their conjunction:

$$\begin{aligned} \mathbf{d} \otimes \mathbf{e} : (\mathbf{P} \times \mathbf{R})^{\text{op}} \times (\mathbf{Q} \times \mathbf{S}) &\rightarrow_{\text{Pos}} \mathbf{Bool}, \\ \langle \langle p, r \rangle^*, \langle q, s \rangle \rangle &\mapsto \mathbf{d}(p^*, q) \wedge \mathbf{e}(r^*, s). \end{aligned}$$

The diagrammatic representation of the monoidal product is reported in ??.