

$$\begin{aligned}
 P(\textit{Failure in Cell}_j \mid \textit{Observations}_t) = & \\
 & P(\textit{Failure in Cell}_j \cap \textit{Target in Cell}_j \mid \textit{Observations}_t) + \\
 & P(\textit{Failure in Cell}_j \cap \textit{Target not in Cell}_j \mid \textit{Observations}_t)
 \end{aligned}$$