Privacy Gain

- Under the assumption equal prior $P[t_s] = 0.5$ and perfect linkage in case of raw dataset $P[MIA_t(R) = t_s] = 1$

$$PG_t(S, R) \triangleq \frac{1 - P[MIA_t(S) = t_s]}{2}$$

$P[MIA_t(S) = t_s] = 1$

Publishing S is equivalent to publishing R

$P[MIA_t(S) = t_s] = 0$

Publishing S reduces the adversary's chance of success

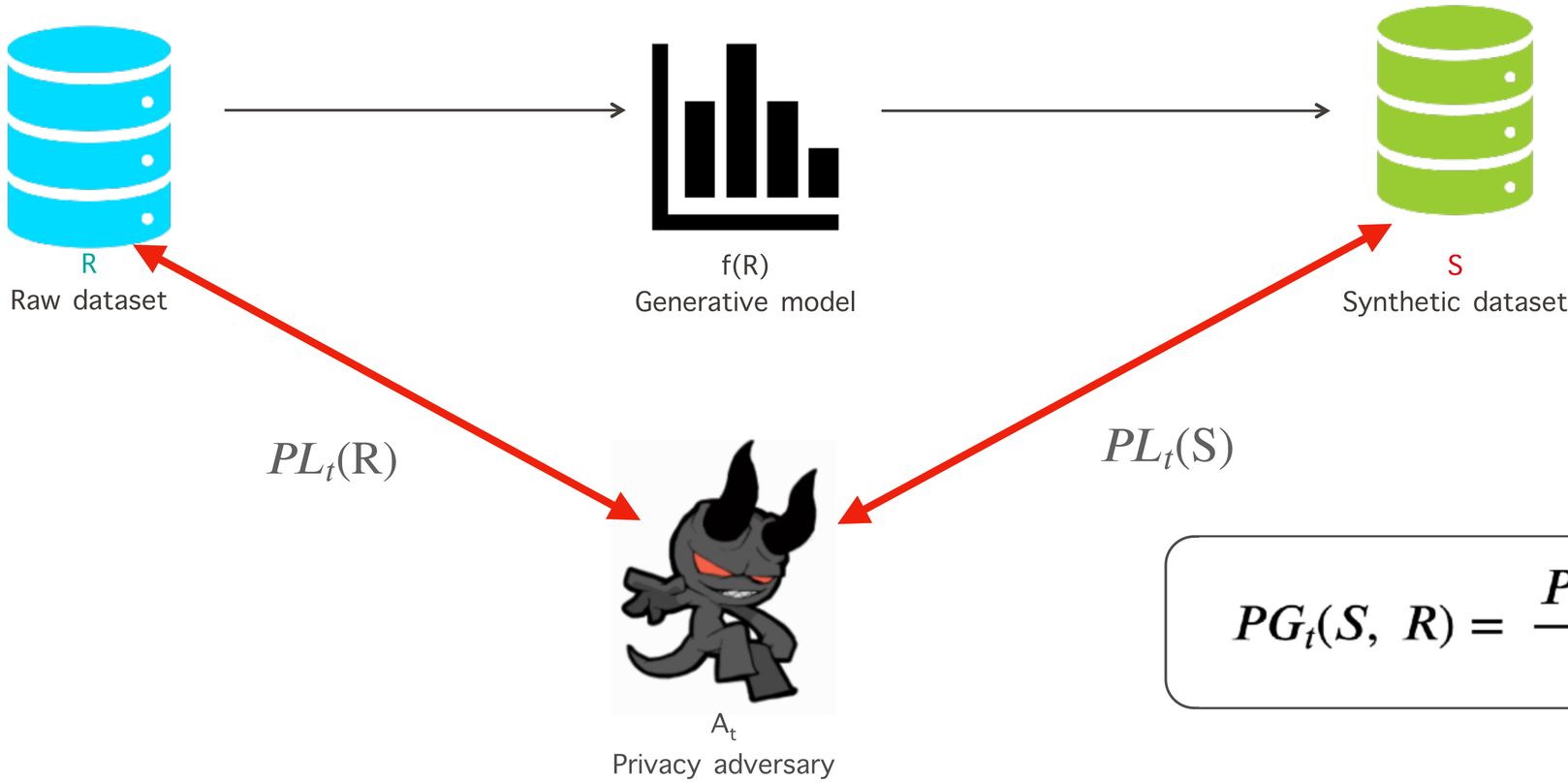
$PG_t = 0.25$

$PG_t = 0$ $PG_t = 0.5$

$P[MIA_t(S) = t_s] = 0.5$

Publishing S gives the adversary no advantage over random guessing

Privacy Gain



$$PG_t(S,\ R) = \frac{PL_t(\mathrm{R}) - PL_t(S)}{2}$$