

Title: Differential Privacy with Information Flow Control

Abstract:

We investigate the integration of two approaches to information security: information flow analysis, in which the dependence between secret inputs and public outputs is tracked through a program, and differential privacy, in which a weak dependence between input and output is permitted but provided only through a relatively small set of known differentially-private primitives.

We find that information flow for differentially private observations does not need to be harder than dependency tracking. Differential privacy's strong guarantees allow for efficient and accurate dynamic tracing of information flow, allowing the use of existing technology to extend and improve the state of the art for the analysis of differentially-private computations.