Generalized Ultrafilters

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Abstract

Our starting point is the observation that ultrafilters on a set X correspond to Boolean algebra homomorphisms $\mathbf{2}^X \to \mathbf{2}$ where the power set $\mathbf{2}^X$ is identified with the Cartesian product $\prod_{x \in X} \mathbf{2}$.

We use category theory to generalize this, emphasizing a connection with monads on $\mathcal{S}et$ and with many valued logic.