

Reversibility of relational structures

Miloš S. Kurilić and Nenad Morača

Department of Mathematics and Informatics, University of Novi Sad,
Trg Dositeja Obradovića 4, 21000 Novi Sad, Serbia.

milos@dmi.uns.ac.rs

nenad.moraca@dmi.uns.ac.rs

Abstract

Let $L = \langle R_i : i \in I \rangle$ be a non-empty relational language, and let $\text{Int}_L(X) = \prod_{i \in I} P(X^{n_i})$ be the set of all interpretations of the language L , over the domain X . We define an equivalence relation \sim_c on $\text{Int}_L(X)$ called the condensation equivalence, such that $[\rho]_{\sim_c}$ is the convex envelope of $[\rho]_{\cong}$ in the Boolean lattice $\langle \text{Int}_L(X), \subset \rangle$. We study interpretations for which $[\rho]_{\sim_c} = [\rho]_{\cong}$, that is for which the set $[\rho]_{\cong}$ is convex in $\langle \text{Int}_L(X), \subset \rangle$ (the so called weakly reversible interpretations). If in addition, the set $[\rho]_{\cong}$ is a weak antichain in $\langle \text{Int}_L(X), \subset \rangle$, the interpretation ρ is called reversible, and if it is a singleton, the interpretation ρ is called strongly reversible. We give characterization of strongly reversible interpretations and several sufficient conditions for an interpretation to be reversible.