学会名
演題名
発表者
内容
Norihiro Kamide
情報電子工学科　学会発表
【発表者について】アンダーラインは本学教員、研究員および技術職員、○は発表者、※は大学院生、卒研生または卒業生
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An extended paradefinte Belnap-Dunn logic that is embeddable into classical logic and vice versa
In this study, an extended paradefinite Belnap-Dunn logic (PBD) is introduced as a Gentzen-type
sequent calculus. The logic PBD is an extension of Belnap-Dunn logic as well as a modified
subsystem of Arieli, Avron, and Zamansky's ideal four-valued paradefinite logic known as 4CC. The
logic PBD is formalized on the basis of the idea of De and Omori's characteristic axiom scheme for
an extended Belnap-Dunn logic with classical negation (BD+), even though PBD has no classical
negation connective but can simulate classical negation. Theorems for syntactically and
semantically embedding PBD into a Gentzen-type sequent calculus for classical logic and vice versa
are proved. The cut-elimination and completeness theorems for PBD are obtained via these
embedding theorems.