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Overview

In this part of the dissertation we consider Blackwell games. Blackwell games are infinite games of imperfect information, where both players simultaneously make their moves, infinitely many rounds are played, and payoff is determined by a Borel measurable function f on the set of possible resulting sequences of moves. In particular, we consider the problem of determinacy for Blackwell games, and give elementary proofs of determinacy for Blackwell games whose payoff function is an indicator function of a Borel set up to complexity $G_{\delta\sigma}$. For general Borel payoff functions, we give a reduction, found by T. Martin[16], to the determinacy of Borel perfect information games.

In Chapter 2, we informally introduce the concepts behind Blackwell games, for those that are unfamiliar with Blackwell games or game theory in general.

In Chapter 3, we formally define Blackwell games and other concepts, and prove several basic results that are used in the other chapters.

In Chapter 4, we look at proofs of determinacy for Blackwell games with payoff functions of varying complexity.

In the last chapter of this part, Chapter 5, we consider Blackwell games whose payoff function is not Borel measurable, formulate an analogue of the Axiom of Determinacy for these games, and compare some of the consequences of this 'Axiom of Blackwell Determinacy' with those of the original Axiom of Determinacy.